GUYANA'S NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN (2012 - 2020)

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Ministry of Natural Resources and the Environment

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ACRONYMS

ABS	Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilization
BEAP	Biodiversity Enabling Activities Project
CBO	Community Based Organization
CEPA	Communication, Education and Public Awareness
COP	Conference of Parties
CSBD	Centre for the Study of Biological Diversity
CTO	Caribbean Tourism Organization
EPA	Environmental Protection Agency
EU-FLEGT	European Union Forest Law Enforcement, Governance and Trade
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FEOW	Freshwater Ecoregions of the World
GEF	Global Environment Facility
GFC	Guyana Forestry Commission
GGMC	Guyana Geology and Mines Commission
GoG	Government of Guyana
GRIF	Guyana REDD+ Investment Fund
IIED	International Institute for Environment and Development
LCDS	Low Carbon Development Strategy
LME	Large Marine Ecosystem
LRC	Land Reclamation Committee
MDG	Millennium Development Goals
MEA	Multilateral Environmental Agreements
MNRE	Ministry of Natural Resources and the Environment
MRVS	Monitoring, Reporting and Verification System
NBAP	National Biodiversity Action Plan
NBSAP	National Biodiversity Strategy and Action Plan
NCSA	National Capacity Self Assessment
NDS	National Development Strategy
NEAP	National Environmental Action Plan
NGO	Non-Governmental Organization
RDT	Rapid Diagnostic Tool
UNCBD	United Nations Convention on Biological Diversity
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme

EXECUTIVE SUMMARY

This summary provides information on:

- Guyana's obligations to the Convention on Biological Diversity (UNCBD);
- a brief history of the preparation of National Biodiversity Action Plans;
- the new national development trajectory which served as the basis for updating the NBAPII; and
- the vision, strategic objectives and a snapshot of priority areas and key actions related to biodiversity which will be implemented during the period 2012 to 2020 under the revised NBSAP.

I. Background and National Context

The UNCBD provides a global legal framework for action on biodiversity. The Convention is dedicated to promoting sustainable development and recognizes that biological diversity is about more than flora and fauna and their ecosystems – it is about people and the need for food security, medicines, fresh air and water, shelter, and a clean and healthy environment in which to live. The Convention, therefore, has three main goals:

(i) The conservation of biodiversity.
(ii) Sustainable use of the components of biodiversity.
(ii) Sharing the benefits arising from the commercial and other utilization of genetic resources in a fair and equitable way.

Guyana was among the 168 countries which signed the United Nations Convention on Biodiversity (UNCBD) when it was opened for signature in June 1992 and subsequently ratified the Convention in August 1994. Currently (2014), there are 194 Parties to the Convention. Four national reports to the UNCBD have been prepared and submitted by Guyana for the periods 1994-1999, 2000-2003, 2004-2006 and 2007-2010. A fifth report (2011-2014) is currently being prepared.

II. Brief Background and Overview of the NBSAP Preparation

Guyana's first NBAP (1999-2004) was prepared with the overall goal "*to promote and achieve the conservation of Guyana's biodiversity, to use its components in a sustainable way, and to encourage the fair and equitable sharing of benefits arising out of the use of Guyana's biodiversity*". The second NBAP (NBAP II) covered the period 2007 to 2011 and followed a thematic approach rather than a programmatic approach. The four thematic areas addressed were forests, agriculture, coastal resources, and marine and freshwater resources. Cross-cutting issues were also identified.

During 2014, the NBAPII was revised and updated to the National Biodiversity Strategy and Action Plan (NBSAP) (2012-2020). This Plan sets out the vision, the roles, duties and obligations of the state and its citizens and the actions to protect, conserve, use sustainably and share equitably the benefits arising from biodiversity. It provides the guidance and support actions for sustainable utilization and conservation of biodiversity, and sets out the national priorities and the strategic objectives to be achieved. It allows as well, partners at all levels to better identify how they can contribute and support Guyana in meeting its national biodiversity vision while meeting at the same time, its obligations to the UNCBD. To this end, the Plan incorporates the goals of the UNCBD Strategic Plan for Biodiversity (2011-2020) and selected Aichi 2011- 2020 Targets.

III. Process of Revising NBAPII to NBSAP to align with the National Vision, the CBD Strategic Plan for Biodiversity (2012-2020), and the Aichi Targets

In 2014, through a process involving extensive desktop reviews of documents, meetings with key sector stakeholders, international and national NGOs and the private sector and a national consultation exercise, a revised National Biodiversity Strategy and Action Plan (NBSAP) (2012-2020) for Guyana was prepared. A Stocktaking Exercise was also undertaken and the information garnered was used in the revision process. This Stocktaking exercise was conducted to assess the current status and trends in

biodiversity in Guyana and the mechanisms pursued to ensure the effective management and protection of biodiversity. An assessment of stakeholders' knowledge and use of the previous NBAP (2007-2011) as well as the extents of biodiversity mainstreaming activities were also done.

IV. Guyana's Vision for Biodiversity

By 2030, biodiversity is sustainably utilized, managed and mainstreamed into all sectors contributing to the advancement of Guyana's bio-security, and socio-economic and low carbon development.

V. National Context

Guyana is situated on the northern coast of South America and is approximately 215,000 km^2 in size with a population recorded at the last census in 2012 of approximately 747,883 persons. Agriculture and extractive industries are the primary contributors to Guyana's economy and over the last two years, there has been average economic growth of 5 percent annually. Per capita Gross Domestic Product (GDP) has risen from US$ 1,694 in 2006 to US$ 3,496.3 in 2013[1]. Agriculture, forestry and fishing sectors accounted for approximately US $67,579 million of the GDP in 2012 while mineral production declared value was US $40,411 million of the GDP[1].

VI. Guyana's Biological Diversity: Status, Trends & Threats

Guyana is situated in the neo-tropical bio-geographical territory of northeastern South America and is also part of the Guiana Shield region which forms part of the Amazon Biome. The Amazon Biome, spanning 6.7 million km^2, is the single largest remaining tropical rainforest in the world and is home to at least 10% of the world's known biodiversity[2].

Guyana is home to a vast expanse of primary tropical forest, freshwater and other unique ecosystems and is considered to have four (4) main natural regions[3] - the Coastal Plain, Hilly Sand and Clay Region, Interior Savannas, and Forested Highlands, although the FAO has mapped five (5) separate Physiographic Regions as follows:

i. The Coastal Plain.
ii. Interior Alluvial Plains and Low-lying Lands.
iii. The 'White Sand' Plateau and Older Pediplains.
iv. Crystalline Shield Uplands.
v. Highlands, Mountains and Plateaux.

The major ecosystems that can be distinguished within these landscapes are (i) forest, (ii) freshwater, (iii) wetland, (iv) savannah, (v) coastal, and (vi) marine. These ecosystems support diverse species to the extent that as of 2010 Guyana's species status was estimated at 8,000 plant species; 467 fishes; 130 amphibians; 179 reptiles; 814 birds; 225 mammals; 1,673 arthropods; over 1,200 fungi; 33 bacteria; 13 nematode; 44 algae; 17 molluscs; and, an estimated 30 viruses.

According to the FAO[4], Guyana has a total of 1182 native tree species of which 1 species *Vouacapoua americana* is listed by the IUCN Red List as Critically Endangered. Three species: *Trichilia surumuensis*, *Aniba rosaedora, Virola surinmensis*, are listed as Endangered and a total of 18 species are listed as Vulnerable.

No Critically Endangered mammals are known to occur in Guyana. The only Endangered mammal listed by the IUCN for Guyana is the Giant Otter (*Pteronura brasiliensis*). The only Endangered bird species listed in Guyana are the Sun parakeet (*Aratinga solstitialis*); Hoary-throated spinetail (*Synallaxis kollari*);

[1]National Budget, 2014. Budget Speech, Sessional Paper No. 1 of 2014, Tenth Parliament of Guyana, Under the Constitution of Guyana, First Session 2012-2014.
[2] WWF-Guianas Wetlands of Guyana study, 2012.
[3] Guyana's National Land Use Plan, 2013.
[4]FAO, Global Forest Resources Assessment, 2005. http://www.fao.org/forestry/country/20807/en/guy/.

and the Red siskin (*Carduelis cucullata*). Guyana has no listed Critically Endangered or Endangered freshwater vertebrates. Of the species known to occur in Guyana, 4.5% of mammals, 0.4% of birds, 3% of amphibians, 3.3% of reptiles and 0.3% of freshwater fish are threatened[5].

Guyana's biodiversity provides an important basis for climate regulation, poverty reduction, provisioning of freshwater, economic growth and development in areas such as, agriculture, forestry and fisheries, payment for forest climate services, and community based economies, particularly in hinterland communities. Loss of biodiversity and any disruption in the provision of ecosystem services would impact negatively on the economy and more particularly on the quality of life in the hinterland and Amerindian communities.

Climate change, deforestation and land degradation have recently received greater recognition as current and future drivers of environmental change and threats to Guyana's biodiversity. These pressures have been increasing over the past decade. In addition, emerging threats that will affect biodiversity in the future include (i) overfishing, (ii) depletion of the mangrove fringe, and (iii) expansion of extractive industries.

From the stocktaking assessment conducted, it was found that biodiversity is mainstreamed at various levels and by different stakeholders. A summary of key efforts are listed below:

- Guyana's Low Carbon Development Strategy: The LCDS provided the framework to reconcile protection of the rainforest while pursuing economically rational development. In 2009, the GoG launched this innovative strategy to pursue low carbon economic development while conserving forests in an effort to support global climate change mitigation and earn revenue from forest climate services. Through the LCDS and partnership with the Kingdom of Norway, Guyana is implementing one of the first models of avoided deforestation (REDD+).
- Guyana's Agriculture Strategy: Guyana's vision for agriculture is one which seeks to promote and develop the sector to produce food and non-food commodities to meet local and export demands. The Strategy seeks to not only expand subsistence agriculture but also to push entrepreneurial enterprise and to diversity agriculture by embracing non-traditional crops and support large-scale agriculture expansion.
- EU Forest Law Enforcement, Governance and Trade (EUFLEGT): Guyana and the European Union (EU) are currently negotiating a Voluntary Partnership Agreement (VPA) under the existing EU FLEGT Action Plan. The VPA is expected to contribute to the sustainable management of Guyana's forests, employment and economic development.
- Guyana Sea and River Defence Policy: Guyana's coast is vulnerable to increased coastal erosion as a result of the impacts of extreme weather and climate change. The Government has developed a Sea and River Defence Policy[6], which calls for alternative solutions to traditional sea defence structures and includes the re-establishment of mangroves for flood protection and safeguarding environmental resources. With this policy framework and with support from the EU, a national mangrove management project is being implemented that is seeking to manage and restore mangrove ecosystems as well as provide alternative livelihoods for local communities.

Since ratifying the UNCBD, Guyana has taken significant steps toward meeting its obligations and ensuring conservation and protection of its natural resources. Below is a summary of the key achievements:

- national policies were developed including the National Forest Policy, National Land Use Policy, Policy on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilization, and National Biosafety Framework;

[5] World Wildlife Fund (WWF)-Guianas, 2012. Wetlands of Guyana – An insight into the ecology of selected wetlands with recommendations from WWF-Guianas.

[6] National Mangrove Management Action Plan, 2010-2012.
http://www.gcca.eu/sites/default/files/catherine.paul/national_mangrove_management_action_plan_2010-2012.pdf.

- national strategies were developed to assist in biodiversity management and protection, including the LCDS and Protected Areas Strategy;
- national plans were also developed including the National Forest Plan, National Protected Areas System Plan, National Land Use Plan, and the National Mangrove Management Action Plan;
- key pieces of legislation were enacted to conserve and protect biodiversity including the Wildlife Management and Conservation Regulations, Species Protection Regulations, Protected Areas Act, and the Forest Act. The Wildlife Management and Conservation Regulations were gazetted in 2013 and the Wildlife Import and Export, Biosafety and ABS legislations are currently being developed;
- in April 2014, Guyana acceded to the Nagoya Protocol on Access and Benefit Sharing;
- institutional and governance arrangements were strengthened with the creation of the Ministry of Natural Resources and the Environment (MNRE) in 2011 which has as its primary focus the harmonizing of policy and management in the natural resources-based sectors, and better mainstreaming of conservation and environmental management[7]. All the natural resources related Agencies and Commissions are now under the purview of the Ministry; and
- significant progress was made regarding protected areas, including the establishment of the Protected Areas Commission (PAC) and two new protected areas (Kanuku Mountain Protected Area and the Shell Beach Protected Area), efforts to create the National Protected Areas Trust Fund, development of a strategic plan for the PAC, development of a plan for the National Protected Areas System (NPAS), management plans for individual protected areas, and establishing field presence in protected areas.

VII. Key information which informed the updating/ revision of the NBSAP

Importance to the economy

In Guyana, natural resources and biodiversity provide a wide range of goods and services which are critical to the growth and development of the economy and well being of Guyanese. In 2013, the value of foreign exchange earnings to the Guyana economy shows that more than 95% of the earnings were related to use of natural resources and biodiversity/ecosystem services (Box 3). This is expected to increase in the future with proposed increased investment in agriculture, ecotourism and the extractive sector.

Low Carbon Development

In a 2008 policy decision, the Government of Guyana (GoG) signaled its intention and commitment to pursue a climate resilient low carbon approach to development.

For the past six years, the GoG has worked at the multilateral level to establish a Reducing Emissions from Deforestation and Forest Degradation (REDD+) framework through which Guyana is paid for forest climate services its forest provides and which has set the stage for payments for forest conservation and sustainable forest management. To date (2014), Guyana has earned three consecutive payments from Norway totaling US $115 million through the policy framework of the LCDS. In the last quarter of 2013, the annual third party audit of Guyana's performance under the partnership established with Norway was completed, clearing the way for a fourth payment[8].

Increased investment in Ecotourism for growth and job creation

Guyana's biodiversity has had immense regional (CARICOM) and international exposure through the winning of regional awards and international acclaim as an ecotourism destination.

For the last three years (2011-2013), Guyana has dominated the Caribbean Tourism Organization (CTO) /Travel Mole Sustainable Tourism Awards which recognize individuals, groups, organizations or

[7]2012 Annual Report MNRE.
http://www.nre.gov.gy/Annual%20Report/MNRE%20-%20ANNUAL%20REPORT%202012.pdf.
[8]National Budget, 2014.

companies in any of the CTO Member Countries which have developed unique and attractive tourism products or are engaged in implementing sustainable tourism-related initiatives which embrace sustainable tourism concepts and core values. Guyana has won awards for sustainable tourism, heritage protection, biodiversity and community benefit.

In the international arena, *National Geographic Traveler* in 2011pegged the "Amerindian Guyana" trip offered by Wilderness Explorer, a national tour operator, as the world's best in their annual feature "50 Tours of a Lifetime". *Traveler* also named the indigenous owned and operated Surama Eco-Lodge as one of the best hotels in South America for their 2011 Stay List[9]. In 2014, *Traveler* named Guyana as one of the 2014′s must-see places on planet earth as Guyana offers curious travelers an opportunity to experience one of only four remaining intact rain forest ecosystems on the planet[10].

The contribution of tourism to the national economy has increased over the last 10 years (Table 7). In 2013, visitor arrivals totalled 200,122 reflecting a 13.3 percent increase over 2012. The GoG has given its commitment to continue to pursue initiatives to ensure the development of a vibrant and sustainable tourism industry, in collaboration with the private sector.

Increased projection in growth of the mining (gold) industry

Declared gold production from small and medium scale miners rose 48% between 2007 and 2011. The increase in declared production coupled with rising prices has led to a rapid increase in the importance of gold in Guyana's economy growing around 30% per year from approximately US $170 million in 2007 to over US $570 million in 2011[11]. In 2013, the gold mining sector once again played an important role in the domestic economy and delivered record breaking production valued at US $648.5 million[12].

The prospects for large-scale mining for gold in Guyana are still very real as demonstrated investor confidence remained unshaken where large-scale projects for gold are concerned. In 2012, Foreign Direct Investment (FDI) flows into Guyana amounted to US$ 294 million, a 19% rise from 2011. Inflows were concentrated in the mining industry (bauxite and gold), as well as in telecommunication[13].

As of 2012, there was approximately CDN $600 million worth of investments in mining in Guyana, with some 50 gold mining operations. There are two large companies which are expected to extract three to five million ounces of gold[14]. The adoption of innovative technology is unfolding to deal with the issues associated with mercury abatement, improved efficiencies in recovery to offset cost of production, and to reduce threats to the environment.

Increasing threat of land degradation

There are some areas across Guyana that are potentially vulnerable to land degradation. The 2008 land degradation assessment[15] revealed the following:

- land degradation is apparent on forested and mining lands and could be mitigated and/or prevented if appropriate policy mechanisms are instituted in a timely manner;
- land degradation has not received national attention and as such, the extent to which this event is

[9]Food and Agriculture Organization (FAO). http://www.fao.org/forestry/country/19971/en/guy/.
[10]Food and Agriculture Organization (FAO). http://www.fao.org/forestry/country/19971/en/guy/.
[11] Guyana's Extractive Industry Sector, 2013. A Synopsis of Issues and Recommendations for the mining sector as a Sustainable Element of Guyana's Low Carbon Development Strategy (LCDS). Contributors: Conservation International Guyana – D. Singh, C. Bernard, P. Rampersaud, T. Laing (Consultant), and D. Balraj; Projekt Consult GmbH - M. Priester and T. Hentschel; WWF Guianas – P. Williams, A. Williams, O. Davis, and L.C. Watson (Consultant).
[12]National Budget, 2014.
[13] Foreign Direct Investment in Latin America and the Caribbean, 2012. UNECLAC.
http://www.cepal.org/publicaciones/xml/4/49844/ForeignDirectInvestment2012.pdf
[14] Positive reports on mining development in Guyana – Canada's Foreign Minister visit to Guyana. Guyana Times, August 16, 2012.
http://www.guyanatimesinternational.com/?p=19028
[15]National Assessment of Land Degradation in Guyana - Diagnostic Report - Lands and Surveys Commission, United Nations Development Programme & Global Environment Facility, 2008.

occurring has not been measured. From information from the stakeholder entities coupled with visual observation, it was found conservatively that current annual degradation ranged between 150,000 and 160,000 hectares, but is projected to increase to between 200,000 and 250,000 hectares annually over the next 5 to 10 years nationally. This figure may be higher if soil analyses are conducted; and

- the nature-base orientation of current tourism initiatives seek to maintain an environment which retains its natural pristine beauty and eco-system functionality and may be at risk based on the locations of these initiatives.

VIII. Key Challenges and gaps

Though Guyana has made considerable progress in biodiversity conservation and sustainable use, critical challenges/gaps remain.

Some main challenges/gaps have been identified are as follows:

- the absence of a specific policy to address biodiversity in Guyana;
- the need for harmonization of various legislation to address the suite of biodiversity issues;
- insufficient funds and an improved mechanism to access funding;
- limited technical capacities and insufficient qualified staff in key natural resources institutions;
- limited or no awareness of the NBSAP by key stakeholders in the sector;
- limited baseline data to establish adequate trends on biodiversity;
- the absence of a robust monitoring system without which it will be difficult to demonstrate success of any programmes, action plans, strategies or policies or attribution of this success; and
- the absence of a single, authoritative and accountable source of biodiversity and other environmental data compiled from various sources including from the private sector, NGOs and communities. This is an essential requirement for decision-making.

IX. NBSAP Strategic Objectives (SO) and Priority Actions

This updated NBSAP (2012 -2020) which has nine strategic objectives (SO):

- reflects Guyana's low carbon development thrust;
- reflects mainstreaming of biodiversity in priority sectors such as agriculture, mining and ecotourism, and *in situ* and *ex situ* conservation of biodiversity;
- recognizes the need for better quality of information to assess status, threats and trends in biodiversity;
- emphasizes the need for communication, resource mobilization, capacity building and coordination strategies to ensure effective natural resources planning and management; and
- places emphasis on monitoring and evaluation and better implementation of the conventions and protocols.

The nine strategic objectives of the Plan are in line with the strategic objectives of the MNRE and are follows:

SO1: Improve the status of biodiversity by conserving ecosystems, species and genetic diversity and by restoring biodiversity and ecosystem services in degraded areas.
SO2: Promote the conservation, sustainable use and value of biodiversity into key productive sectors used for growth, expansion and diversification of the economy.
SO3: Expand and improve awareness, appreciation and communication on biodiversity and ecosystems.
SO4: Improve national implementation, monitoring and reporting for Multilateral Environmental Agreements (MEAs) and other bilateral commitments.
SO5: Create stronger and wider national, regional and international partnerships that contribute to achieving the goal and objectives of this Plan.
SO6: Consolidate/harmonize policy, legal, regulatory, and administrative frameworks that support the sustainable use, protection and management of biodiversity resources.

SO7: Improve substantially biodiversity monitoring at the national level and within key productive sectors.
SO8: Strengthen the knowledge base and capacity for conservation, management and sustainable use of biodiversity.
SO9: Secure adequate resources from national, regional and international sources for the implementation of the Plan.

Several priority areas for action during the period 2012 to 2020 are identified in the Plan. These include:

- Expansion of protected areas to meet the goal of 17% of terrestrial area *in-situ* conservation in legal protection by 2020. To ensure that these areas would also be effectively managed, capacity would be built for planning, establishment and management of protected areas. A National Protected Areas Trust Fund would be established which is expected to contribute significantly to the financial sustainability of these protected areas.
- Rehabilitation and restoration of mangrove belts and degraded mined out areas.
- Promotion of soil health through the prudent utilization of biological, chemical and physical methods in an eco-system agronomic approach.
- Development of guidelines for responsible recreational fishing and better practices in ornamental fish collection and handling.
- Establishment of a fully function REDD+ Framework and a Monitoring Reporting and Verification (MRV) system to support this framework.
- Development of the EU Forest Law Enforcement, Governance and Trade (FLEGT) timber legality assurance system for Guyana to ensure that all timber for export to the EU will be verified as being legal and granted a FLEGT license.
- Restructuring and reorienting the Zoological Park's representativeness of ecosystems in Guyana with a view to increasing and expanding awareness of biodiversity particularly among children, increasing learning outdoors, and increasing schools' abilities to teach outdoors.
- Reviews of existing legislation and outcomes of Environmental Impact Assessments (EIAs) and their roles in protecting biodiversity.
- Compilation and consolidation of biodiversity data from local, international and web-based sources including traditional knowledge and development of a database system for biodiversity which makes data freely available to users.

The sum of the proposed actions will contribute to all five Goals of the CBD Strategic Plan 2011-20 and 14 of the 20 Aichi Targets. Specific details of the actions, lead agencies and how the actions contribute to the achievement of the goals of CBD Strategic Plan 2011-2020 and the Aichi Targets are provided in Table 5 in the body of the Plan.

To enhance implementation of the Plan, capacity building and technology needs are also included as components of the Plan along with communication and resource mobilization strategies and a proposed coordination structure.

X. National Vision and Goal for Biodiversity

Vision
By 2030, biodiversity is sustainably utilized, managed and mainstreamed into all sectors contributing to the advancement of Guyana's bio-security, socio-economic and low carbon development**.**

Goal
By 2020, biodiversity is valued, effectively conserved, protected and restored where appropriate, delivering significant benefits and contributing to climate change mitigation and adaptation in a way that is acceptable nationally and globally.

1. INTRODUCTION

1.1 Background and Context

Guyana was among the 168 countries which signed the United Nations Convention on Biological Diversity (UNCBD) when it was opened for signature in June 1992 and subsequently ratified the Convention in August 1994.Currently (2014), there are 194 Parties to the Convention.

The Convention on Biological Diversity provides a global legal framework for action on biodiversity. It brings together the Parties in the Conference of the Parties (COP) which is the Convention's governing body that meets every two years, or as needed, to review progress in the implementation of the Convention, to adopt programmes of work to achieve its objectives, and provide policy guidance. To date (May 2014), the Conference of the Parties has held eleven ordinary meetings, and one extraordinary meeting for the adoption of the Biosafety Protocol under the UNCBD[16].

The UNCBD is dedicated to promoting sustainable development and recognizes that biological diversity is about more than flora and fauna and their ecosystems – it is about people and the need for food security, medicines, fresh air and water, shelter, and a clean and healthy environment in which to live. The Convention, therefore, has three main goals: (i) the conservation of biodiversity, (ii) sustainable use of the components of biodiversity, and (iii) sharing the benefits arising from the commercial and other utilization of genetic resources in a fair and equitable way.

The COP has established seven thematic Programmes of Work:

i. Agricultural Biodiversity.
ii. Inland Waters Biodiversity.
iii. Marine and Coastal Biodiversity.
iv. Forest Biodiversity.
v. Dry and Sub-humid Lands Biodiversity.
vi. Island Biodiversity.
vii. Mountain Biodiversity.

Initiated by the COP are several other areas of work, considered as key and relevant to all of the thematic Programmes of Work. These areas of work cover the rapidly evolving field of biotechnology, technology development and transfer, benefit-sharing, and biosafety (Box 1).

Box 1: Other Key and Relevant Areas of Work to CDB Thematic Programmes.	
▪ Aichi Biodiversity Targets ▪ Access to Genetic Resources and Benefit-sharing ▪ Biological and Cultural Diversity ▪ Biodiversity for Development ▪ Climate Change and Biodiversity ▪ Communication, Education and Public Awareness ▪ Economics, Trade and Incentive Measures • Ecosystem Approach • Gender and Biodiversity • Global Strategy for Plant Conservation • Global Taxonomy Initiative	▪ Impact Assessment ▪ Identification, Monitoring, Indicators and Assessments ▪ Invasive Alien Species ▪ Liability and Redress ▪ Protected Area ▪ Sustainable Use of Biodiversity ▪ Tourism and Biodiversity ▪ Traditional Knowledge ▪ Technology Transfer and Cooperation

In 2010, at the tenth meeting of the COP held in Japan, a revised and updated Strategic Plan for the period 2011 to 2020 "*Living in Harmony with Nature*" was adopted. The plan defines a shared vision, a

[16] http://www.cbd.int.

mission, five strategic goals (Box 2) and 20 objectives, collectively known as the Aichi Targets. The Strategic Plan adopts a holistic approach by promoting the integration of biodiversity into all relevant sectors and policy areas and also specifically addresses social and economic dimensions. It provides an overarching framework on biodiversity for all governments and partners engaged in biodiversity management and policy development.

At the tenth meeting, Parties also agreed to translate this international framework into national actions through revision and updating of national biodiversity strategies and action plans. The targets provide a flexible framework to inform development of national plans, taking into account national circumstances and priorities.

Box 2: The Strategic Plan for Biodiversity 2011 – 2020: Living in Harmony with Nature.

VISION

By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.

- **Goal A**: *Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.*
- **Goal B:** *Reduce the direct pressures on biodiversity and promote sustainable use.*
- **Goal C:** *Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.*
- **Goal D:** *Enhance the benefits to all from biodiversity and ecosystem services.*
- **Goal E:** *Enhance implementation through participatory planning, knowledge management and capacity building.*

Additionally, it was agreed that the fifth national country reports due in 2014, should focus on the implementation of the Strategic Plan and report on progress towards achieving the Aichi targets. The declaration of 2011-2020 as the United Nations Decade on Biodiversity (with a view to contributing to the implementation of the Strategic Plan) was another decision taken at this meeting. The United Nations General Assembly, recognizing the importance of biodiversity, encouraged countries to use the 2011-2020 Strategic Plan in the elaboration of the post 2015 development agenda[17].

Having ratified the Convention, Guyana, as a Party, has committed to implementing the UNCBD and the decisions taken at the Conference of Parties. In revising NBSAPs, countries do not need to have a national target for each global target in the UNCBD Biodiversity Strategy. The Guyana NBAP II will therefore be revised to an updated NBSAP to address national priorities and aligning these with the Global Biodiversity Strategy Framework.

Guyana is a Party to the Cartagena Protocol on Biosafety, having acceded on March 18, 2008. As such Guyana is expected to align its implementation actions with the Protocol's 2011-2020 Strategic Plan and focal areas[18]. These areas are:

- facilitating the establishment and further development of systems for the implementation of the Protocol;
- capacity building;
- compliance and review;
- information sharing; and
- outreach and cooperation.

On April 22, 2014, Guyana also acceded to the Nagoya Protocol on Access and Benefit Sharing. Upon its entry into force (as of May 2014 not yet in force), this Protocol will represent an internationally agreed and binding framework which will enhance legal certainty and transparency for users and providers of genetic resources; promoting adequate benefit-sharing where genetic resources leave the territory of the provider country and associated traditional knowledge is being utilized; as well as supporting mechanisms to monitor and ensure stakeholders' compliance with mutually agreed terms and national Access Benefit Sharing regulatory frameworks.

[17] http://www.cbd.int/idb/doc/2013/messages/idb-2013-unsg-message-en.pdf.

[18] http://bch.cbd.int/protocol/.

1.2 National Context

Guyana believes that its forest can play an important role in addressing the global problem of climate change and its effects. At the same time, it is recognized that Guyana is a developing country and that its forest resources are its principal natural asset for obtaining revenue needed for the growth and development. The challenge, however, is whether the forests can be maintained to help in the global fight against climate change and financial resources be received for doing so. The GoG is optimistic that this can be done and has set out in its LCDS a clear vision and strategy to accomplish this goal in the long term.

Most of the forested areas in Guyana are suitable for timber extraction. Significant mineral deposits also exist below the surface. An independent assessment conducted in 2008 estimated the value of Guyana's forests (if harvested and the land put to the highest value use) to be between US $4.3 billion and US $23.4 billion[19]. The wide range of estimates is influenced by fluctuating prices for commodities such as logs, rice and palm oil – but the most likely estimate is US $5.8 billion. This forest value known as Economic Value to the Nation (EVN) is the equivalent of an annual annuity payment of between US $430 million and US $2.3 billion, with the most likely annuity payment being US $580 million.

However, generating this EVN through maximizing forest resources utilization, while economically rational for Guyana, would have significant negative consequences for the world. The deforestation that would accompany this development path would reduce the critical environmental value, which Guyana's forests provide. Conservative valuations of the Economic Value to the World (EVW) provided by Guyana's forests suggest that, left standing, they contribute US $40 billion to the global economy each year[2].

Guyana has identified food security as a way to end poverty and hunger by 2025 and agriculture as the vehicle to achieve this. Guyana's vision for agriculture seeks to change the view that agriculture is for subsistence livelihood while promoting agriculture as a wealth generator and entrepreneurial enterprise, producing food and non-food commodities to meet local and export demands.

This vision is based on the premise that agriculture is central to food and nutrition security and to sustained economic growth for Guyana. Agriculture is also seen as the most feasible way to provide economic opportunities for poor, rural and vulnerable communities.

Agriculture played a crucial role in moving Guyana up from a least developing, highly indebted country in 1990 to being a low middle income country as well as contributing significantly to the national economy. Approximately 40% of total exports come from agriculture. In 2013, rice exports amounted to US $243 M (14% of total exports), sugar US $132.2 M (9.5%), shrimp and fish US $63.9 M (4.6%), timber US $39 M (2.8% of total exports) and other crops (fruits & vegetables) accounted for US $4.7 M (0.3% of total exports).

The contribution of tourism to the national economy has increased over the last 10 years (Table 7). In 2013, visitor arrivals totaled 200,122 reflecting a 13.3 percent increase over 2012. GoG has given its commitment to continue to pursue initiatives to ensure the development of a vibrant and sustainable tourism industry in collaboration with the private sector.

The National Development Strategy (NDS) identifies tourism as a sector that can contribute to the sustainable development of Guyana by earning foreign exchange and providing job opportunities, while conserving the natural environment and the multi-faceted culture of the country. The LCDS has given recognition to Guyana's tourism potential particularly in the ecotourism segment pointing out the potentials in the light of a rapidly growing ecotourism market (20-30% per year) while recognizing that development requires a gradual build-up of capabilities, infrastructure and brand over time. In the last decade, significant efforts were made to attract high-end ecotourists from North America and Europe in niche markets, initially to the Rupununi area. Over the last four years, tourism grew annually at an

[19]Low Carbon Development Strategy, 2010. Office of the President. http://www.uncsd2012.org/content/documents/Revised-LCDS-May-20-2010-draft-for-MSSC.pdf.

average rate of 20% in the Rupununi and Guyana went from two international tour operators booking trips to over forty-five international tour operations booking trips[20].

Guyana's forest ecosystems and biodiversity are, in many ways, key factors which support community-based activities related to culture, recreation, scientific research, education and ecotourism opportunities. One such example is the socio-cultural and economic benefits derived from forests by hinterland communities such as Surama and Konashen who are highly dependent on the range of goods and services made available from the ecosystem. This importance to the indigenous communities is further elaborated in section 3.4.1.

Historically, relatively low deforestation rates have been reported for Guyana. As at January 2012, approximately 87% of the land area is covered by forests - approximately 18.5 million ha[21]. A comparatively low deforestation rate is reported, ranging between 0.02% and 0.079% per annum.

Guyana's species status as of 2010 stood at an estimated: 8,000 plant species; 467 fishes; 130 amphibians; 179 reptiles; 814 birds; 225 mammals; 1,673 arthropods; over 1,200 fungi; 33 bacteria; 13 nematodes; 44 algae; 17 molluscs; and, an estimated 30 viruses. Of the species known to occur in Guyana, 4.5% of mammals, 0.4% of birds, 3% of amphibians, 3.3% of reptiles and 0.3% of freshwater fish are threatened[22].

Guyana has had success so far in gaining recognition that its forest can play an important role in addressing the global problem of climate change and its effects and at the same time obtaining revenue needed for national growth and development. Despite this success, however, key challenges remain *viz*:

- integrating conservation and sustainable use of biodiversity across all sectors of the economy and society;
- creating stronger linkages with economic policies and plans, e.g. PRSP; and
- coordinating integrated planning and implementation of actions related to biodiversity at the national and local levels.

Significant gaps still remain in the areas of biodiversity data and information and translation of these into the kinds of knowledge needed to inform decision-making. Awareness and appreciation of the value of biological resources to human well being by the society at large including the private sector is still lacking.

With this revised NBSAP, opportunities exist to:

- establish systems and processes to engage various sectors, e.g. education institutions, traditional productive sectors such as mining and agriculture, and new emerging sectors such as tourism;
- enhance knowledge and expertise relevant for the conservation and sustainable use of biodiversity through partnerships with international institutions such as CI and WWF, local communities and NGOs, and academic institutions such as the University of Guyana; and
- use multidisciplinary-based approaches that would bring together resources and knowledge from different fields, technologies and disciplines including social sciences.

[20] Guyana's Low Carbon Development Strategy, 2013.
[21] Guyana Forestry Commission, 2013.
[22] World Wildlife Fund (WWF)-Guianas, 2012. Wetlands of Guyana – An insight into the ecology of selected wetlands with recommendations from WWF-Guianas.

2. PROCESS FOLLOWED TO REVISE THE NBSAP

This revised National Biodiversity Strategy and Action Plan (2012-2020) (NBSAP) was based on extensive desktop reviews of documents provided by stakeholders and those accessed through internet searches, meetings and discussions with key sector stakeholders, international and national Non-Governmental Organizations (NGOs) and the private sector. Extensive use was made of the guidelines, manuals and other recommended resources for the preparation of NBSAPs which included but was not limited to the following:

i. Strategic Plan for Biodiversity (2011-2020).
ii. Aichi Biodiversity targets.
iii. Indicators for the Strategic Plan for Biodiversity 2011-2012 Note by the Executive Secretary.
iv. Possible indicators for the Strategic plan 2011-2020 UNEP/CBD/AHTEG-SP.
v. Biodiversity Planning Support Programme. A Guide for Countries Preparing National Biodiversity Strategies and Action Plans[23].

A Stocktaking Exercise was conducted to assess the current status and trends regarding biodiversity and the mechanism pursued to ensure the effective management and protection of biodiversity. The focus of the Stocktaking Exercise was the updating of information and identifying changes since the Fourth National Report to the UNCBD through:

- a rapid review of relevant policies, plans and reports;
- assessment of the causes and consequences of biodiversity loss; and
- assessment of current capacities and collection of socioeconomic data that would be useful in evaluating the value of biodiversity to the national economy.

Additionally, the Biodiversity Mainstreaming Rapid Diagnostic questionnaire was used during the conduct of interviews with key stakeholders, to assess knowledge and use of the current NBSAP and the extent of biodiversity mainstreaming activities. This questionnaire was developed under the NBSAP 2.0 Mainstreaming Biodiversity and Development Project implemented by the International Institute for Environment and Development (IIED), UNEP World Conservation Monitoring Centre in collaboration with the CDB Secretariat, UNEP, UNDP and the Poverty Environment Initiative.

As part of the wider consultation process for revising the NBSAP, a national consultation workshop was held on July 15, 2014. The consultation workshop sought to furnish stakeholders with a preliminary version of the draft updated NBSAP. At the workshop, stakeholders were allowed to provide feedback based on their review of the draft NBSAP and make further suggestions so that the final NBSAP would be an informed product of integrating the UNCBD obligations into the national planning processes. Following the workshop, there was an additional period for the submission of comments. All comments received were collated and reviewed by MNRE/EPA and included in the final NBSAP as appropriate.

At the Workshop, 60 persons from 28 different institutions attended and provided feedback on the draft NBSAP. Institutions represented ranged from international development organisations, international NGOs, international financial institutions, Caribbean regional institutions, government ministries and agencies, national NGOs, indigenous organisations and communities, private sector, local government and national legal institutions.

Discussed also at the workshop working group sessions were the following questions pertaining to key components of the NBSAP.

CAPACITY DEVELOPMENT AND TECHNOLOGY NEEDS

1. Is the current capacity adequate to allow for effective implementation of the NBSAP?

[23] Prepared by Roy T. Hagen. http://www.cbd.int/nbsap/doc/guidelines/hagen-nbsap-guidelines-en.pdf.

2. If no, what capacity constraints exists, and in which areas?
3. How can capacity be enhanced?
4. Are enough resources available locally to adequately enhance capacity?
5. What are the technology needs of the various institutions/agencies to adequately implement the NBSAP?
6. Are these technology in place or will have or be acquired?
7. How can this be done?
8. Is there the required skill set to utilize the required technology?
9. If no, how can this be enhanced?

RESOURCE MOBILIZATION

1. What resources are required for the effective implementation of the NBSAP?
2. Where can the resources be sourced from? Which agencies/institutions can provide them?
3. How can this be done?
4. Is there the need for a national strategy to attract funding for biodiversity related activities?

COMMUNICATON STRATEGY

1. What are the priority issues to be communicated?
2. Given the priority issues, what is our message?
3. What resources are needed?
4. What should be the target groups and why?
5. What media should be used; for which groups, and why?
6. What partners are necessary; what are potentially useful?
7. Funding, where should it come from?

NATIONAL COORDINATING STRUCTURES

1. What is the current understanding of the national coordinating structure for biodiversity management and conservation?
2. What limitations exist that would have impacted on a collaborative approach to the NBAP implementation?
3. Which agencies/institutions have critical roles in the implementation of the NBSAP?
4. Since the EPA is the focal point of the UNCBD, what role does the Ministry of Natural Resources and the Environment play in implementing the NBSAP?
5. What mechanism can the lead agency (EPA) utilize to engage key sector agencies and other stakeholders in implementing the NBSAP?
6. How can other agencies/institutions support the EPA in the implementation of the NBSAP?

VISION STATEMENT

A vision statement was developed which was further elaborated by the EPA/MNRE and incorporated into the revised NBSAP.

3. SUMMARY OF COUNTRY CONTEXT

Guyana is rich in biodiversity with 2,022 vertebrate species and 8,000[24] vascular plant species and is part of the Guiana Shield, a geomorphologic complex that is extremely rich biologically, located in northeastern South America (Figure 1). The variety of landscapes of the Guiana Shield includes sandstone tepuis, granite inselbergs, white sands, seasonally flooded tropical savannas, lowlands with numerous rivers, isolated mountain ranges, and coastal swamps, each supporting a characteristic vegetation[25]. This variety accounts for a great deal of the high diversity and endemicity of the Shield's biota. The highlands of the Shield have flora and fauna with numerous endemic species[26].

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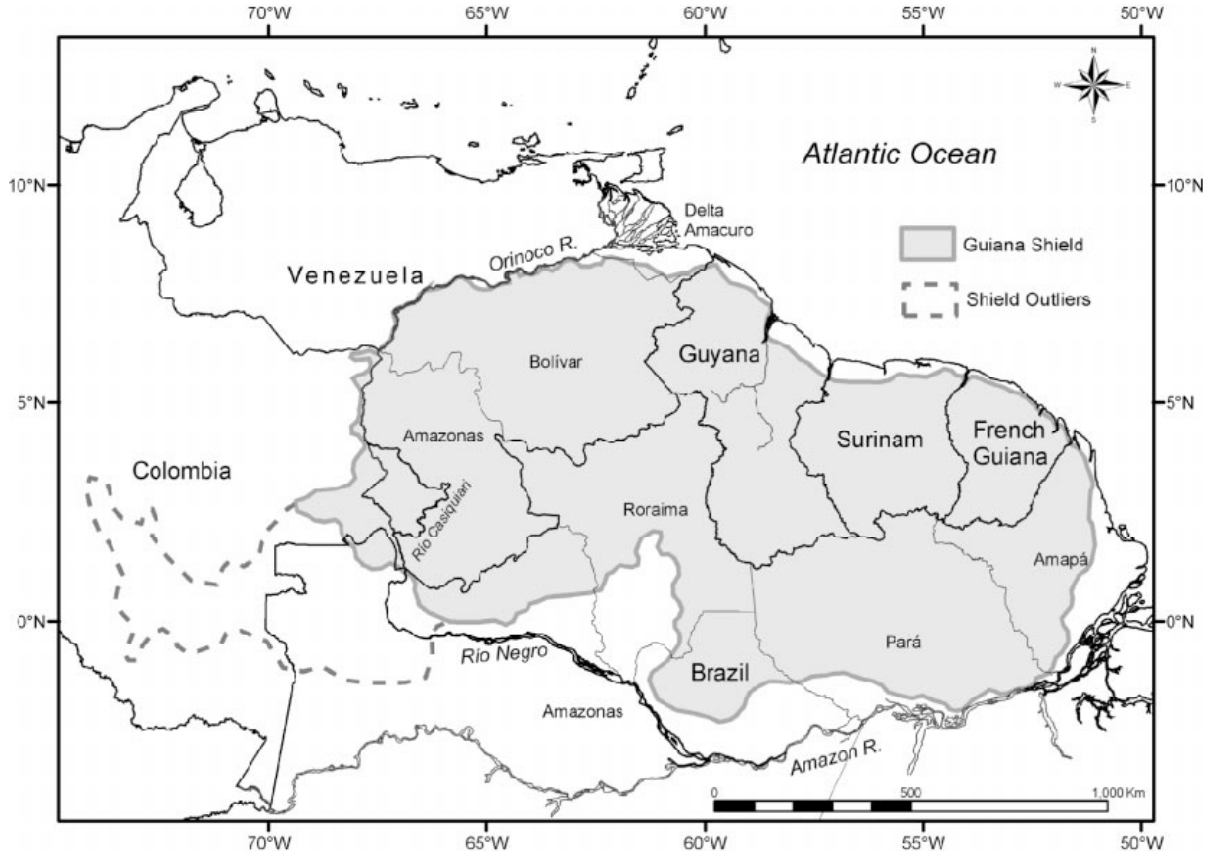


Figure 1: The Guiana Shield Region with the region of western outliers indicated[27].

3.1 Policy, Legislative, Institutional Context

3.1.1 National Policy

Guyana developed a number of national policies related to biodiversity conservation and management, mostly within the framework of natural resources management. These policies all aim towards

[24] 4th National Report to the Convention on Biological Diversity, Guyana.
[25] Huber *et al*., 1995. *In* Checklist of the Terrestrial Vertebrates of the Guiana Shield, Hollowell, T., and R. P. Reynolds, eds. Bulletin of the Biological Society of Washington, no. 13.
[26] Hollowell, T., and R. P. Reynolds, eds. 2005. Checklist of the Terrestrial Vertebrates of the Guiana Shield. Bulletin of the Biological Society of Washington, no. 13.
[27] Gibbs & Barron, 1993. *In* Checklist of the Terrestrial Vertebrates of the Guiana Shield, Hollowell, T., and R. P. Reynolds, eds. Bulletin of the Biological Society of Washington, no. 13.

conservation and management of Guyana's natural resources, inclusive of sustainable utilization of its components. These policies include:

1. National Forest Policy (2011).
2. Policy on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilization (2007).
3. Biotechnology, Biosafety and Biosecurity Policy (2007).
4. Integrated Water Resources Management Policy and Roadmap (2013).
5. National Development Strategy (2001-2010[28]).
6. Low Carbon Development Strategy (2013).
7. National Competitiveness Strategy (2006).
8. Guyana Poverty Reduction Strategy Paper (2011 – 2015).
9. National Strategy for the Conservation and Sustainable Use of Guyana's Biodiversity (1997).
10. National Protected Areas Strategy (2002).
11. Guyana Power Sector Policy and Implementation Strategy (2010 – 2014).

In addition to the above, other national policies currently being prepared include:

1. National Land Use Policy.
2. National Policy on Geographic Information.

At the regional level, policies are also being developed which will contribute to the management, conservation and protection of biodiversity, including:

1. CARICOM Common Fisheries Policy.
2. CARICOM Environmental Policy and Action Programme.

3.1.2 National Plans

Several national plans were developed outlining the approaches to be implemented to ensure the objectives of the national policies relating to natural resources management, use, protection and conservation by the GoG. The relevant plans are listed below:

1. National Environmental Action Plan (2001-2005).
2. National Biodiversity Action Plan II (2007-2011).
3. National Forest Plan (2011).
4. National Protected Areas System Plan (2013-2015).
5. National Land Use Plan (2013).
6. National Mangrove Management Action Plan (revised in 2010).
7. Integrated Coastal Zone Management Action Plan (developed in 2000).
8. Fisheries Management and Development Plan (2006).
9. Draft costed Strategic Framework for the Ministry of Natural Resources and the Environment (2013-2018).

3.1.3 Legislation

Several pieces of legislation were developed to ensure that the country's environment is protected and there is a sustainable use, conservation and protection of the natural resources. The legislation relevant to biodiversity are highlighted below:

1. The 1980 Constitution of Guyana.
2. Environmental Protection Act, 1996.
3. Environmental Protection Regulations, 2000.
    a. The Environmental Protection Authorization Regulations.

[28] While the duration is from 2001 – 2010, currently, it is still considered to be in use.

   b. The Environmental Protection Air Quality Regulations.
   c. The Environmental Protection Water Quality Regulations.
   d. The Environmental Protection Hazardous Waste Management Regulations.
   e. The Environmental Protection Noise Management Regulations.
4. Litter Enforcement Regulations, 2014.
5. Wildlife Management and Conservation Regulations, 2013.
6. Species Protection Regulations, 1999.
7. Protected Areas Act, 2011.
8. Forest Act, 2009.
9. Fisheries Act, 2002.
10. Mining Environmental Regulations, 2005.
11. Kaieteur National Park Act, 1929.
12. Iwokrama International Centre of Rainforest Conservation and Development Act, 1996.
13. Wild Birds Protection Act.
14. Plant Protection Act, 1919.
15. Hydro-Electric Power (Amendment) Act, 2013.

A number of Bills and regulations affecting biodiversity conservation and sustainable management in Guyana are currently being drafted to supplement existing legislation. These include:

1. Wildlife Import and Export Bill – This Bill, tabled in the National Assembly in 2013, is currently being revised. Once made into law, this legislation will allow for the Wildlife Division to become an Authority and the Species Protection Regulations and Wild Birds Protection Act to be repealed.
2. Biosafety Bill.
3. Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) Draft Regulations.

3.1.4 Institutions

Governmental agencies, institutions and management committees which have responsibilities for the protection and conservation of natural resources, including biodiversity are listed below:

1. Ministry of Natural Resources and the Environment.
2. Ministry of Agriculture.
3. Ministry of Tourism.
4. Environmental Protection Agency.
5. Protected Areas Commission.
6. Guyana Forestry Commission.
7. Guyana Geology and Mines Commission.
8. Wildlife Division.
9. Land Reclamation Committee.
10. Integrated Coastal Zone Management Committee.
11. Mangrove Action Committee.
12. Geographical Information Systems (GIS) Committee.
13. National Coordinating Committee on Biosafety and Biosecurity.

Several Non-Governmental Organisations (NGOs) are directly involved in activities which contribute to the protection and conservation of biodiversity, including:

1. Conservation International Guyana.
2. WWF-Guianas.
3. Iwokrama International Center for Rainforest Conservation and Development.
4. Guyana Marine Turtle Conservation Society.
5. The Conservation Trust Fund.
6. Kanuku Mountain Community Representative Group.
7. North Rupununi District Development Board.

8. South Rupununi Conservation Society.
9. Conservation of Ecological Interaction & Biological Association.
10. Village Mangrove Action Committees.
11. Karanambo Trust.

3.1.5 Regional and International Conventions

Guyana is signatory to a number of international and regional conventions and protocols aimed at addressing environmental protection and the conservation of biodiversity. The biodiversity-related conventions, which Guyana is a party to, are outlined in Table 1 below:

Table 1: Biodiversity related Conventions to which Guyana is a Party.

Conventions	Ratification/Accession
United Nations Convention on Biological Diversity	Signatory in 1992 and ratified in 1994
- Cartagena Protocol on Biosafety	Acceded to in 2008
- Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization	Acceded to in 2014
Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973)	Ratified in 1977
Cartagena Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (1983)	Ratified in 2010
- Specially Protected Areas & Wildlife (SPAW) Protocol (1990)	Ratified in 2010
International Plant Protection Convention (1952)	Acceded to in 1970
Convention on the Protection of the World Cultural and Natural Heritage (1972)	Acceded to in 1977

In addition to the Conventions listed above, Guyana participates in activities of the Ramsar Convention on Wetlands (1971) and is a party to the Rio Declaration on Environment and Development (1992). Guyana is also signatory and has acceded to the other conventions aimed at environmental protection and sustainable management of natural resources, as is outlined in Table 2 below.

Table 2: Other Environmental Conventions to which Guyana is a Party.

Conventions	Ratification/Accession
United Nations Convention on Climate Change	Signatory in 1992 and ratified in 1997
- Montreal Protocol	Acceded to in 1993
- Kyoto Protocol	Acceded to in 2003
Vienna Convention on the Protection of the Ozone Layer	Acceded to in 1993
United Nations Convention to Combat Desertification	Signatory in 1996 and ratified in 1997
International Convention for the Prevention of Pollution (MARPOL 73/78)	Acceded to in 1997
Basel Convention on the Control of Trans-boundary Movement of Hazardous Waste and their Disposal	Acceded to in 2001
Stockholm Convention on Persistent Organic Pollutants	Acceded to in 2007
Rotterdam Convention on Prior Informed Consent for Certain Chemicals and Pesticides in International Trade	Acceded to in 2007
Minamata Convention on Mercury	Signatory in 2013

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

1. Caribbean Planning for the Adaptation to Climate Change.
2. Mainstreaming Adaptation for Climate Change.
3. Caribbean Regional Environmental Programme.
4. Caribbean Environmental Programme and its Specially Protected Areas and Wildlife Programme.
5. Latin American Network for Technical Cooperation in National Parks, Protected Areas and Wildlife.
6. Treaty for Amazon Cooperation.
7. Guiana Shield Initiative and Guiana Shield Facility.
8. Guyana is receiving support under the CLME project.

3.2 Biodiversity, Ecosystems & Species

3.2.1 Biogeographic Provinces

Guyana is situated in the neo-tropical bio-geographical realm of northeastern South America and is home to a vast expanse of primary tropical forest, freshwater and other unique ecosystems. Guyana, according to the FAO[29] Global Ecological Zones Map, is divided into three terrestrial ecological zones. These are an extensive central zone of tropical rainforest interspersed between tropical moist deciduous forest and tropical montane forest.

Guyana is part of the Guiana Shield Region which forms part of the Amazon Biome. The Amazon Biome (Figure 2), spanning 6.7 million km^2, is the single largest remaining tropical rainforest in the world and is home to at least 10% of the world's known biodiversity[30].

[29]Food and Agriculture Organization (FAO). http://www.fao.org/forestry/country/19971/en/guy/.
[30] WWF-Guianas Wetlands of Guyana, 2012.

Figure 2: Guyana in relation to South America, Amazonia, and the Guiana Shield Bio-geographic Province[31].

3.2.2 Landscapes and Ecosystems

Guyana is usually considered to consist of four (4) main natural regions[32]; Coastal Plain, Hilly Sand and Clay Region, Interior Savannas and Forested Highlands although the FAO mapped five (5) separate Physiographic Regions as follows:

1. The Coastal Plain.
2. Interior Alluvial Plains and Low-lying Lands.
3. The 'White Sand' Plateau and Older Pediplains.
4. Crystalline Shield Uplands.
5. Highlands, Mountains and Plateaux.

The Natural Regions are shown in Figure 3 and the Physiographic Regions in Figure 4.

<u>The Coastal Plain</u>

The Coastal Plain is a narrow belt (ranging between 8 and 65 km in width with a length of 440 km) stretching from the Corentyne River in the east to Waini Point in the west, and providing most of the

[31]WWF Living Guianas Report, 2012.
[32]Guyana National Land Use Plan, 2013.

agricultural production in the country. East of the Essequibo River, the Plain consists of recent and old sediments with recent deltaic and fluvio-marine clays and silts occurring on the coast with silty clays and sands inland. The recent Plain occurs at elevations of 2 m below to 3 m above sea level with sandy old beach ridges forming higher ground. The older coastal Plain lies at an altitude of about 3-9 m above sea level. The normal tidal range is about 3 m with resultant flooding (particularly sea invasion) especially during the wet seasons from April to August and November to January and during high tides.

Many areas of the Coastal Plain are below sea level while other areas are man-made and built-up to raise them above the surrounding land level. An elaborate system of sea defences, along with irrigation and drainage canals, is required to protect the area from flooding. West of the Essequibo River, the Coastal Plain narrows with extensive organic wetland 'pegasse' deposits inland. While these are most extensive in the west of the country (Regions 1 and 2), they also occur scattered between the Essequibo, Demerara and Berbice Rivers. East of the Berbice River, the pegasse area is small and the coastal 'frontland' and 'riverain' clays relatively wide.

The Hilly Sand and Clay Region

The Hilly Sand and Clay Region is found just inland of the coastal zone, although not in the north-west. This Region is also known as the 'White Sand Plateau' in the north-east and centre of Guyana, although the FAO mapping extends the unit to include older pediplains in the south of the country (Figure 3). The landscape of this Region is gently undulating with altitudes varying from about 15 m above sea level close to the coast to 150 m in the south. The White Sands overlie brown sands and the unit also contains deltaic sands and clays, laterite gravels and bauxite, and is deeply dissected in the centre north of the area. In the north-east, and corresponding to the greatest extent of white sand, the Region has a distinctive vegetation of Wallaba and Dakama forest, Muri scrub and savannah grasslands. The white, sandy soil is permeable and low in nutrients, and forms the most vulnerable ecosystem in Guyana.

The Forested Highlands

The Forested Highlands make up the bulk of the country and are often divided into the Western Highlands and Southern Uplands. The FAO mapping (Figure 4) divides the country into Crystalline Shield Uplands and Highlands, Mountains and Plateaus. The Western Highlands comprise the border of Venezuela and Brazil, and are rugged igneous and metamorphic mountains that are densely forested and virtually inaccessible. Topographically, it is a dissected upland with steep tabular hills and mountains cut by deep gorges. Rivers are fast flowing within deeply dissected terrain, creating deep gorges and waterfalls.

The Southern Uplands is bordered by Brazil and Suriname and consists of four mountain ranges with elevations of 300-1,200 m. Access to these forested ranges is very limited. The Crystalline Shield Uplands occur in the north-west and south-east of Guyana and is part of the larger Guiana Peneplain. The unit is described as a monotonous continually rolling to hilly land, dominantly forested. The Highlands, Mountains and Plateaus unit corresponds primarily to the Pakaraima Mountains but also includes many isolated mountainous areas (inselbergs) within the Crystalline Uplands in the north-west, centre and south of Guyana as well as including the Kanuku and Açarai Mountains.

The Interior Savannahs

The Interior Savannahs account for approximately 8% of the country's area and are vegetated by grasses, scrub and low trees. The Rupununi Savannah is divided into the northern and southern savannas by the Kanuku Mountains. The FAO maps the northern Rupununi Savannahs as Interior Alluvial Plains and the southern Savannahs as part of the White Sand Plateau and Older Pediplains (Figure 4).

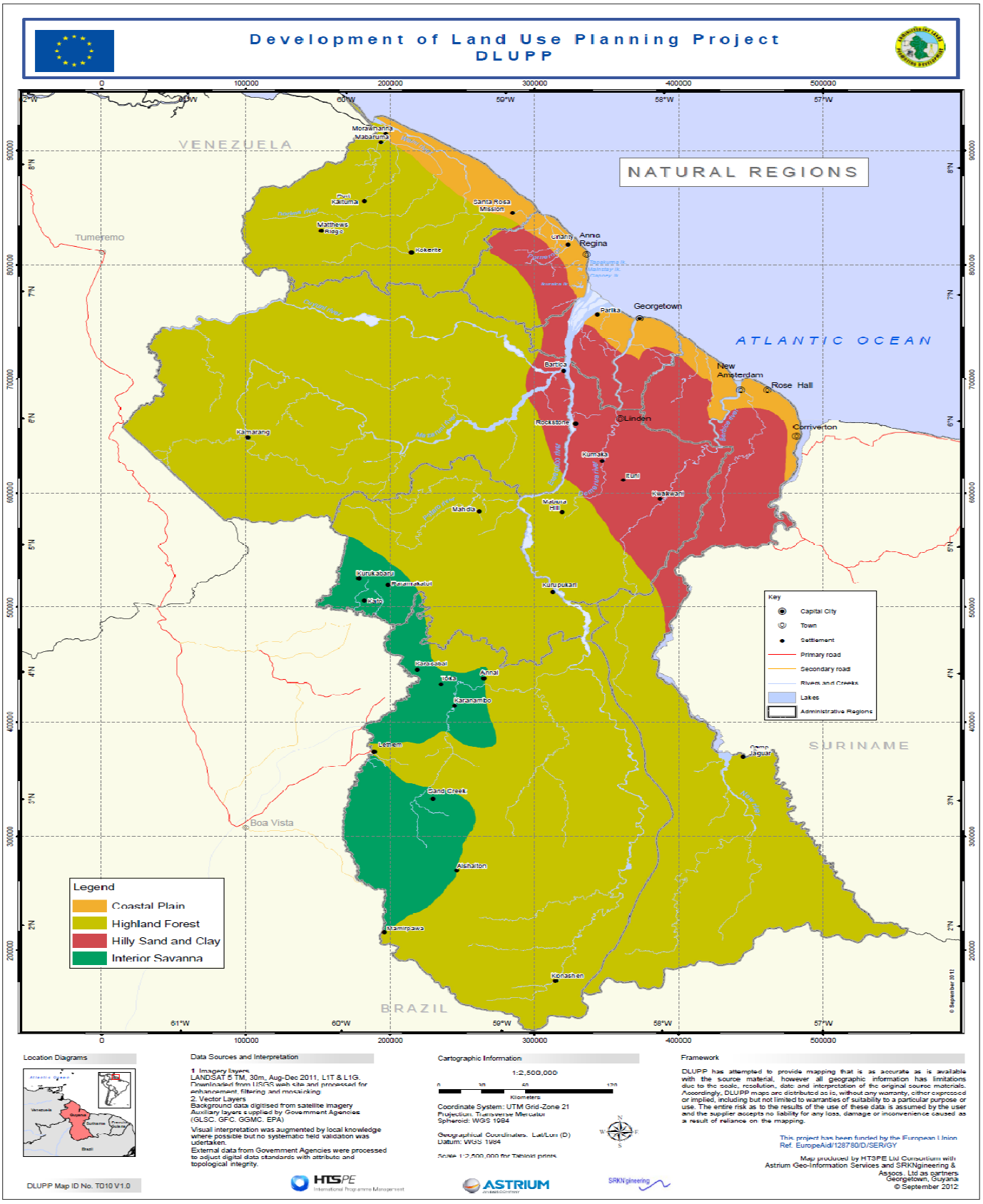


Figure 3: Map showing Guyana's Natural Regions.

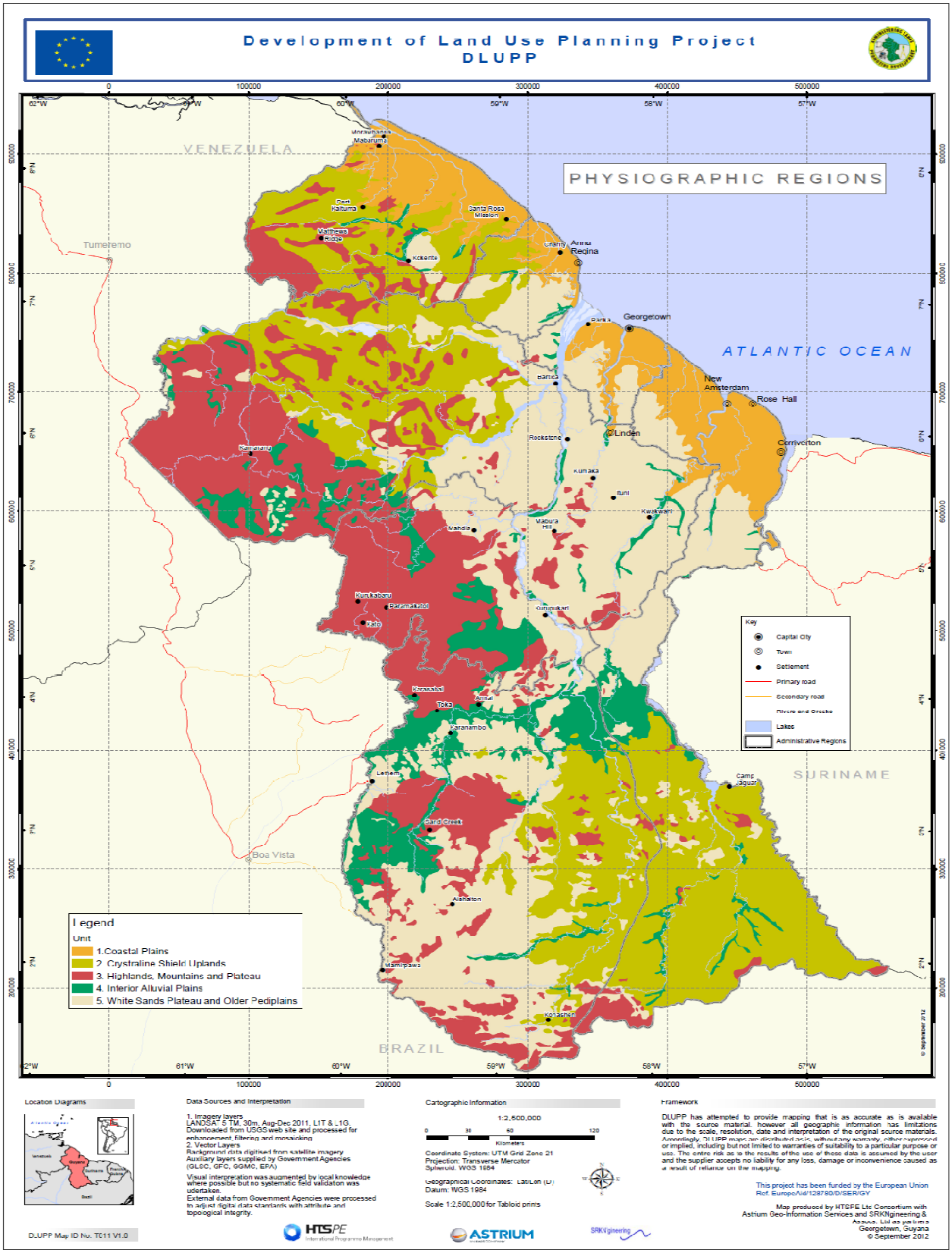


Figure 4: Map showing the five Physiographic Regions of Guyana as defined by the FAO.

The Savannah itself is generally flat but in some areas tends to be more dissected with an undulating topography, particularly to the north and east of the Kanuku range. The northern Savannahs are characterized by large areas of wetlands caused by the backflow of the Takutu and Ireng Rivers during the Amazonian wet season while the southern Savannahs are composed of Precambrian aged rocks. The northern Savannah plain lies at an altitude of about 100-110 m and the Pakaraima Mountains rise abruptly from the plain to altitudes of 610 m and reach heights of 990 m at their highest. The Kanuku Mountains rise to 760-840 m. The southern Savannahs are characterized by a relatively flat plain at a height of 100-120 m with granitic inselbergs rising abruptly from the plain to heights of 760 m.

The major ecosystems found within the landscape regions of Guyana include:

Forests Ecosystems

Five preliminary divisions of the Guianan forest exist within Guyana[33] as follows:

1. Forests in the coastal plain (Venezuela-Guyana-Suriname-French Guiana); includes mangrove forests, coastal swamp forest, seasonally flooded palm marsh and swamp forest, and forest of the old coastal plain (the Coropina formation).
2. Forests in the North West District of Guyana and lowland Venezuelan Guyana; predominantly the dry land of the northwest district.
3. Forests on White Sands Formation (Guyana-Suriname-French Guiana); includes rainforest of the Pleistocene brown sands in central Guyana, rainforest of the Pleistocene brown sands in eastern Guyana, dry evergreen forest on white sands, creek forest of the white sands formation, and rainforest and evergreen forest on laterite ridges.
4. Forests in the Pakaraima-Central Guiana Upland region (Guyana-Venezuela-Brazil); includes lowland and lower montane forests of the Pakaraima uplands on brown sands, lowland and lower montane forests of the Pakaraima uplands on white sands; dry submontane forests of the Pakaraima uplands, Montane forests of the Pakaraima highlands, and Upper Montane forests of the Pakaraima highlands.
5. Forests on the Southern Peneplain (Guyana-Suriname-French Guiana-Brazil); includes the dry to moist forest in the southern Guyana-Brazil border area.

Savannah Ecosystems

Savannah ecosystems are characterized by shrublands and grasslands found at all altitudinal levels within Guyana. In the lowlands, the scleromorphic scrub (also known as muri scrub) is located on white sands and savannas. It also occurs in the Pakaraima Mountains and the Kanuku foothills up to 1,500 m.

Savannahs dominated by grasses are found at all altitudinal levels, from the lowlands to the uplands. In the white sand plateau area in the north, shrub savannahs form an interrupted chain stretching from Guyana into Suriname heavily degraded by human activities. In the Rupununi savannahs, there is a mixed of shrub savannah with woody elements *Curatella americana* and *Byrsomima crassifolia* mixed with open areas dominated by grass *Trachypogon sp*.. They form large alluvial plains crossed by rivers and riparian forests and are exposed to annual dry season fires. The only upland savannah known in the Guiana Shield is located in the Pakaraima Mountains of north-west Guyana. It occurs on some plateaus between 600-1,200 m in the upper Mazaruni. Other herbaceous systems called meadows are characterized by non-grass species associated with highly acidic substrates such as sandy soils on white sands (broadleaf meadows) and also occur in flooded conditions in the Rupununi savannahs.

[33]Steege, H. ter and G. Zondervan, 2000. A preliminary analysis of large-scale forest inventory data of the Guiana Shield in: Plant Diversity in Guyana, with recommendations for a National Protected Area Strategy. The Tropenbos Foundation. Tropenbos Series 18.

Freshwater and Wetland Ecosystems

Three freshwater eco-regions exist within Guyana[34]. These are: the Orinoco Delta and Coastal Drainages; the Essequibo; and the Guianas. The freshwater eco-systems of Guyana are home to at least 476 freshwater fish species of which about 83 species are considered endemic. The Essequibo freshwater eco-region, in particular, serves as a major biological corridor linking to the Amazon Basin and forms a continuous expanse of water during the wet seasons between the tributaries of the Rio Branco in Brazil and the Rupununi River in Guyana[35].

A WWF-Guianas study conducted in 2012 identified and characterized 23 wetlands sites within Guyana (Table 3). The study focused specifically on representative freshwater and brackish water areas of open water bodies, permanently flooded vegetated lands, and seasonally flooded lands.

Table 3: Wetlands Sites in Guyana Studied by WWF-Guianas in 2012[36].

Lake Mainstay, Essequibo Coast	Assakata Lake and wetlands, North West District-NWD
Lake Tapakuma, Essequibo Coast	Baramani Lake, NWD
Lake Capoey, Essequibo Coast	Almond Beach, NWD
Lake Mashabo, Essequibo Coast	George, NWD
Surama Pond, North Rupununi	Arnold Ponds, NWD
Airstrip Pond, North Rupununi	East Demerara Water Conservancy
Oma Pond, North Rupununi	Mahaica-Mahaicony-Abary Conservancy
Devil Pond, North Rupununi	Manarabisi Swamp, Corentyne
Grass Pond, North Rupununi	Sandaca Swamp, Corentyne
Shulinab, South-central Rupununi	Guysuco Conservancy, Corentyne
Sandcreek, South-central Rupununi	Halcrow Conservancy, Corentyne
Moruca Swamp, Moruca Sub-district	

Coastal Ecosystems

Guyana is sandwiched between the estuaries of the Amazon and Orinoco Rivers and the movement of coastal currents and shoals impacts on the siltation of outfalls and the profile of the coastline. The coastal zone is characterized by extensive inter-tidal mudflats, intersected by narrow sand and shell beaches, and major mangrove swamps that are bordered inland by shallow saline and brackish lagoons and swamps. The coastal ecosystem is renowned for its beaches that support the nesting and foraging grounds of migratory sea turtles and birds.

The Shell Beach Protected Area[37] represents Guyana's remnant and receding marine ecosystem. This area represents a combination of coastal forest including mangroves and sandy coastline covering an area of 125,000 ha which is approximately 11% of the protected areas system and 0.58% of country's land mass. The Shell Beach Protected Area provides an annual nesting ground for four endangered marine turtles: the Leatherback, (*Demochelys coriacea*), Hawksbill (*Eretmochelys imbricata*), Olive Ridley (*Lepidochelys olivacea*), and Green turtle (*Chelonia mydas*). The area also encompasses a unique ecosystem of mangrove forests, inland swamp forests and savannahs; and is home to an array of species including manatees (*Trichechus manatus*), tapirs (*Tapirus terrestris*), deer (*Mazama americana*), jaguars (*Panthera onca*), howler monkeys (*Alouatta seniculus*), and other large animals. The bird diversity is one of the richest in Guyana with over 200 species of coastal and migratory birds recorded and includes a variety of parrots and macaws, numerous wading birds including many scarlet ibis (*Eudocimus ruber*) and

[34]Freshwater Ecoregions of the World (FEOW). http://www.feow.org/globalmap.
[35]Watkins, G., Saul, W., Holm, E., Watson, C., Arjoon, D. and J. Bicknell, 2004. The Fish Fauna of the Iwokrama Forest. *Proceedings of the Academy of Natural Sciences of Philadelphia.* Vol. 154, pp. 39-53. Published by: Academy of Natural Sciences.
[36] WWF-Guianas Wetlands of Guyana, 2012.
[37]Text on the Shell Beach Protected Area taken from Guyana's Protected Areas Commission Protected Areas System Plan, 2013-2015.

Caribbean flamingos (*Phoenicopterus ruber*), herons, egrets and the magnificent harpy eagle (*Harpia harpyja*), among a host of others.

Other sand and shell beaches along the wider coastal zone exist in a less pristine state primarily as a consequence of anthropogenic pressures. Mangrove forests are found in fringe communities as a band along the coast, interspersed by sandy beaches in a few places, as well as in small patches along the river mouths and rivers in proximity to the sea. Mangroves form unique ecological niches and habitats for a variety of marine and terrestrial animals.

Marine Ecosystems

The marine habitats of the coast and the deep sea areas of Guyana are not well known as the terrestrial habitats. The marine fishery, composed mainly of prawns and shrimp (sea bob), is an important contributor to the national economy comprising just under 6% of GDP[38]. According to the WWF Guianas Living Guianas Report (2012), the marine habitats of the Guianas (Guyana, Suriname and French Guiana) are highly productive. The high productivity is related to high diversity and abundance of marine species. Many river plumes enrich the marine habitats along the coast of the Guianas with nutrients, including that of the Amazon River and to a lesser extent other major rivers, such as the Corentyne and Essequibo.

A high density of cetaceans is known to occur in the marine ecosystems of the Guianas including the Guiana Dolphin (*Sotalia guianensis*), the West Indian manatee (*Trichechus manatus*), the Sei Whale (*Balaenoptera borealis*), the Blue Whale (*Balaenoptera musculus*), the Sperm Whale (*Physeter macrocephalus*) and the Fin Whale (*Balaenoptera physalus*). The Guyana coast, especially the Shell Beach Protected Area, has become one of the most important nesting areas for all locally occurring sea turtle species.

Guyana's marine ecosystems and by extension the marine ecosystems of the Guianas are part of the North Brazil Large Marine Ecosystem (LME).The North Brazil LME is an oceanic habitat unit that extends from the Caribbean Sea south to the Parnaiba River in Brazil[39].

4.2.3 Species

Guyana's species status as of 2010 stood at an estimated: 8,000 plant species; 467 fishes; 130 amphibians; 179 reptiles; 814 birds; 225 mammals; 1,673 arthropods; over 1,200 fungi; 33 bacteria; 13 nematodes; 44 algae; 17 molluscs; and, an estimated 30 viruses. Of the species known to occur in Guyana, 4.5% of mammals, 0.4% of birds, 3% of amphibians, 3.3% of reptiles and 0.3% of freshwater fish are threatened[40].

4.2.4 Endemism

Guyana is not a phytogeographic entity in itself but is part of the Guiana Shield. Consequently, endemism is either caused by accident (restricted range species) or if a habitat containing endemics is confined to Guyana[41]. Local plant endemism is often associated with such habitats as white sands, serpentine rock, swamps, flood plains, rock outcrops and cloud forest[42].

[38]Guyana National Land Use Plan, 2013.
[39]Ekau, W. and B. A. Knoppers, 2003. A review and redefinition of the Large Marine Ecosystems of Brazil, pp. 355-372 in: Sherman, K. and G. Hempel, (eds.), 2006. Large Marine Ecosystems of the World: Trends in Exploitation, Protection and Research. Elsevier Science. Amsterdam, The Netherlands.
[40] World Wildlife Fund (WWF)-Guianas, 2012. Wetlands of Guyana – An insight into the ecology of selected wetlands with recommendations from WWF-Guianas.
[41]Steege, H. ter, 2000. Plant Diversity. *In* Guyana, with recommendations for a National Protected Area Strategy. The Tropenbos Foundation. Tropenbos Series 18.
[42]Gentry, A. H. 1992. Tropical Forest Biodiversity: distributional patterns and their conservational significance. Oikos 63: 19-28.

The Pakaraima Mountains in Guyana has the highest level of plant endemism in the country, followed by the upper Mazaruni-Kako-Roraima area where high concentrations of endemic species are known to occur and is ranked the second most important area for endemism in Guyana[43].

The majority of endemic vertebrate fauna of Guyana are restricted to highland areas, especially at elevations greater than 1500 m. The lowland endemics comprise largely of widespread species found across the lowland moist forest of the Guianan and Amazonia lowlands.

3.3 Protected Areas and Priority for Conservation

Approximately 5.6% of Guyana's land area is legally protected in the national protected areas system[44]. The KCOC area covering about 3% of Guyana was declared legally protected under the provisions of the Amerindian Act (2006) but is not yet part of the national system of protected areas. The Low Carbon Development Strategy (LCDS) outlines how Guyana intends to ensure that at least 10% of the country's land area would be under some form of protection. Guyana's policy objective is to achieve the UNCBD target of having at least 17% of the country's land and inland water under some form of protection by 2020.

Guyana has made steady progress in conservation and protected areas development. Key accomplishments include the establishment of:

- the Kaieteur National Park in 1929;
- the Iwokrama International Centre for Rainforest Conservation and Development in 1996; and
- the Community Owned Conservation Area at Konashen in 2006.

These achievements led to enacting the Protected Areas Act of 2011, which allowed for the establishment of the NPAS and the PAC as the organization responsible for establishing, managing, maintaining, promoting and expanding the national protected areas system.

The enactment of the Act established the Kanuku Mountains and Shell Beach Protected Areas. These areas joined with the Kaieteur National Park, the Iwokrama Rainforest Reserve, and the Community Owned Conservation Area at Konashen representing 3%, and other areas of biological interest together account for approximately 8.6% of Guyana's landmass. The protected areas system also includes the National Park, Joe Vieira Park, Zoological Park and the Botanical Gardens. The location of the protected areas and other areas of biological interest are presented in Figure 5.

Recently, the PAC, in collaboration with Conservation International-Guyana and the University of Kent, designed a methodology using MARXAN to spatially map important ecosystems and biodiversity areas in Guyana. The analysis provided 'revised maps' of priority areas for biodiversity.

Eco-regional planning was done at the level of the Guiana Shield Region in April 2002 through the "Guyana Shield Conservation Priority-setting Workshop" co-sponsored by Conservation International (CI), the Guiana Shield Initiative of the Netherlands Committee for the IUCN, the Caribbean Sub-regional Resource Facility of the United Nations Development Programme (UNDP), UNDP Suriname, and UNDP Guyana. The workshop identified a series of priority areas for biodiversity and conservation within the Guiana Shield Region. Guyana is included for its importance for areas of high conservation potential, protected areas, and biological priorities for floristics, plant ecology, amphibians and reptiles, mammals, birds, invertebrates, fish and freshwater ecology.

[43]Steege, H. ter, 2000. Plant Diversity in Guyana, with recommendations for a National Protected Area Strategy. The Tropenbos Foundation. Tropenbos Series 18.
[44] Protected Areas Commission, June 2013; Protected Areas System Plan (2013-2015).

3.4 Uses of Biodiversity

Guyana's biodiversity provides an important basis for climate regulation, poverty reduction, provisioning of fresh water and hydropower, economic growth and development in areas such as agriculture, forestry and fisheries, payment for forest climate services, community based economies, particularly in hinterland communities and biodiversity-related education, scientific research and recreation. Loss of biodiversity and any disruption in the provision of ecosystem services would impact negatively on the economy and more particularly on the quality of life in the hinterland and indigenous communities.

3.4.1. Cultural, socio-economic importance of biodiversity to local indigenous people

Guyana is culturally diverse with several indigenous cultures as well as cultural influxes from Europe, Africa, India and China. Amerindian communities, in particular, are rich in traditional conservation knowledge.

Guyana's forest ecosystems and biodiversity are, in many ways, a key factor which supports community-based activities related to culture, recreation, scientific research, education and ecotourism opportunities. One such example is the socio-cultural and economic benefits derived from forests by hinterland communities such as Surama and Konashen who are highly dependent on the range of goods and services made available from the ecosystem.

Surama[45] is a small Amerindian community of about 287 Makushi people living in the north Rupununi. The Surama Eco-tourism Enterprise started modestly in the early 1990s by accommodating scientists from Iwokrama through the provision of food and accommodation. Since then, the community has managed to develop an eco-tourism product, managed by the village Tourism Management Committee, that directly benefits more than 75% of people living in the village.

The Konashen Community Owned Conservation Area which was established by the community is now the largest protected area in the country and is managed exclusively by the community. This effectively brings more than one million acres of rainforest under sustainable management while ensuring the continued development of the Wai Wai people and their traditional way of life.

3.5 Changes in the Status and Trends of Ecosystems

Development activities in Guyana have led to changes in the extent and integrity of natural ecosystems. These changes have been most apparent in forests and coastal systems.

[45] Information downloaded from http://suramaecolodge.com/.

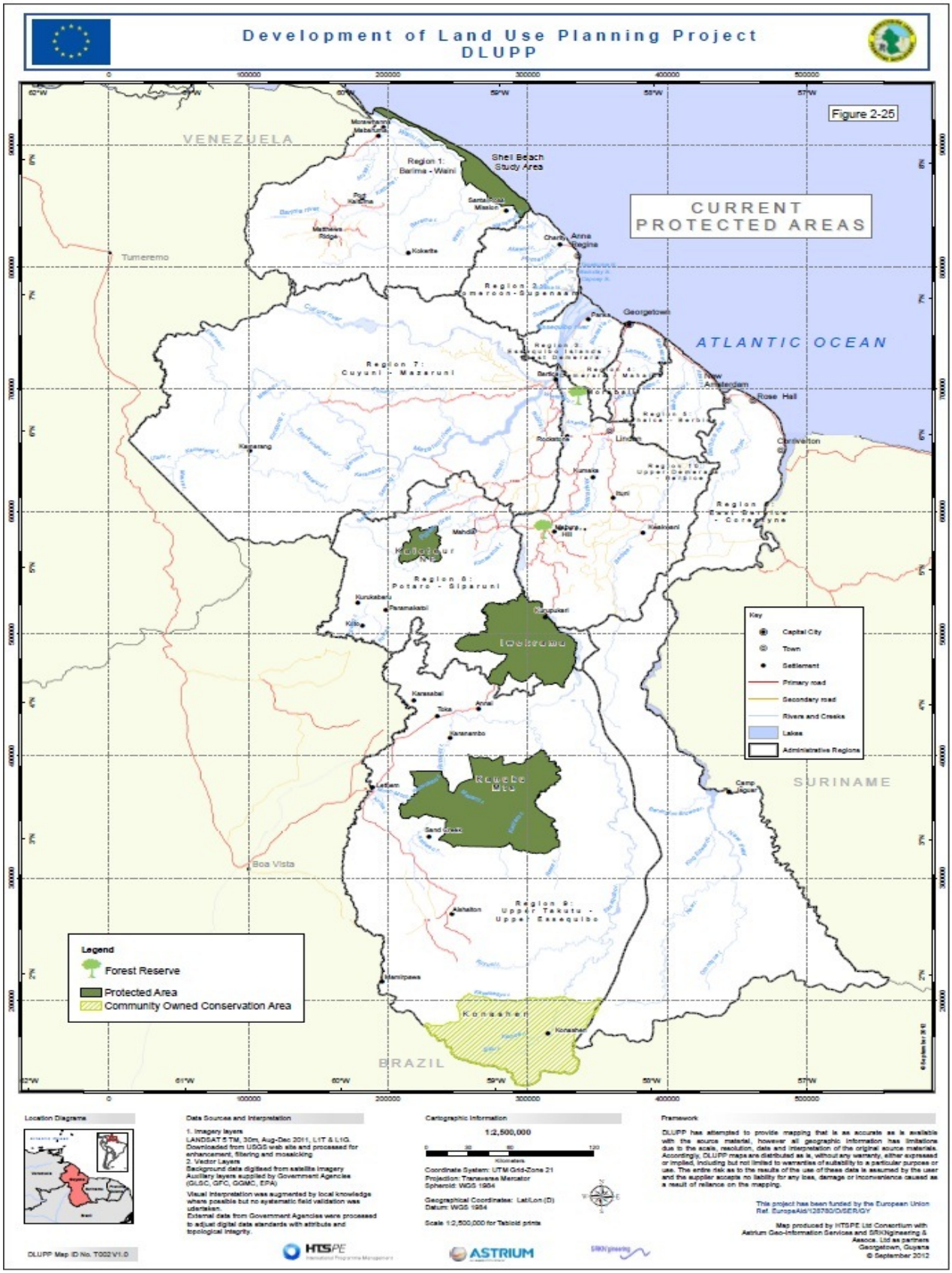


Figure 5: Guyana's Protected Areas.

Forest Ecosystems

Historically, relatively low deforestation rates have been reported for Guyana. As at January 2012, approximately 87% of the land area is covered by forests - approximately 18.5 million ha[46]. A comparatively low deforestation rate is reported, ranging between 0.02% and 0.079% per annum. The total change and change expressed as a percentage of forest remaining is shown in Table 4.

Table 4: Area Deforested 1990 to 2012[47].

Period	Years	Forest Area ('000 ha)	Change ('000 ha)	Change (%)
Initial forest area (1990)		18473.39		
Benchmark (Sept. 2009)	19.75	18398.48	74.92	0.41%
Year 1 (Sept. 2010)	1	18388.19	10.28	0.056%
Year 2 (Oct. 2010 to Dec. 2011)	1.25	18378.30	9.88	0.054%
Year 3 (Jan. 2012 to Dec. 2012)	1	18487.88	14.65	0.08%

Overall, Guyana's Year 3 deforestation rate is still low when compared to the rest of South America, which according to the FAO 2010 forest resource assessment is tracking at an annual deforestation rate of -0.41%/yr. Figure 6 shows the deforestation trend by period. The trend suggests that deforestation rates have increased since 1990 but have remained reasonably constant over the last two assessment periods with a small decrease shown in Year 2 followed by an increase in Year 3.

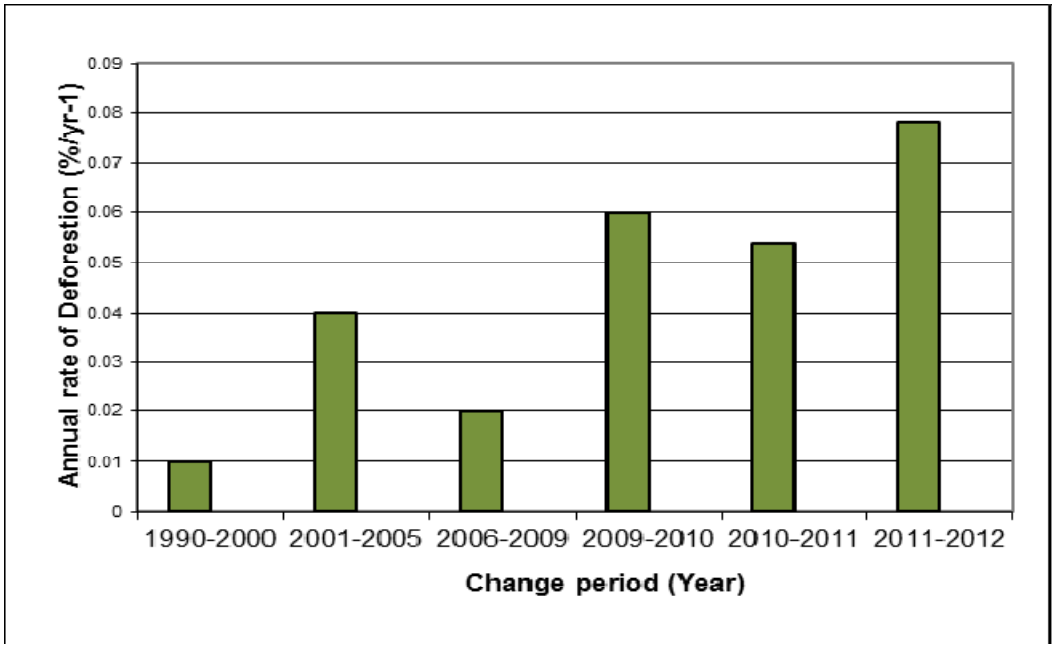


Figure 6: Annual Rate of Deforestation by Period from 1990 to 2012[48].

Deforestation rates typically expand along with economic development. According to the MRVS Interim Measures Report (2011), the main drivers of deforestation and degradation in Guyana are anthropogenic change drivers that lead to deforestation. These included:

[46] GFC, December, 2013. Guyana REDD+ Monitoring Reporting and Verification System (MRVS), Year 3 Interim Measures Report – 01 January 2012 – 31 December 2012, Version 3.
[47] GFC, December, 2013. Guyana REDD+ Monitoring Reporting and Verification System (MRVS), Year 3 Interim Measures Report – 01 January 2012 – 31 December 2012, Version 3.
[48] GFC, December, 2013. Guyana REDD+ Monitoring Reporting and Verification System (MRVS), Year 3 Interim Measures Report – 01 January 2012 – 31 December 2012, Version 3.

- forestry (clearance activities such as log landings);
- mining (ground excavation associated with small and large scale mining);
- infrastructure such as roads (included are harvesting and mining roads);
- agricultural conversion; and
- fire (all considered anthropogenic and depending on intensity and frequency can lead to deforestation).

The main sources of degradation were identified as:

- Selective and illegal harvesting of timber;
- Shifting cultivation; and
- Fire.

Table 5 shows Forest Change Area for Guyana by Period and Driver from 1990 to 2012.

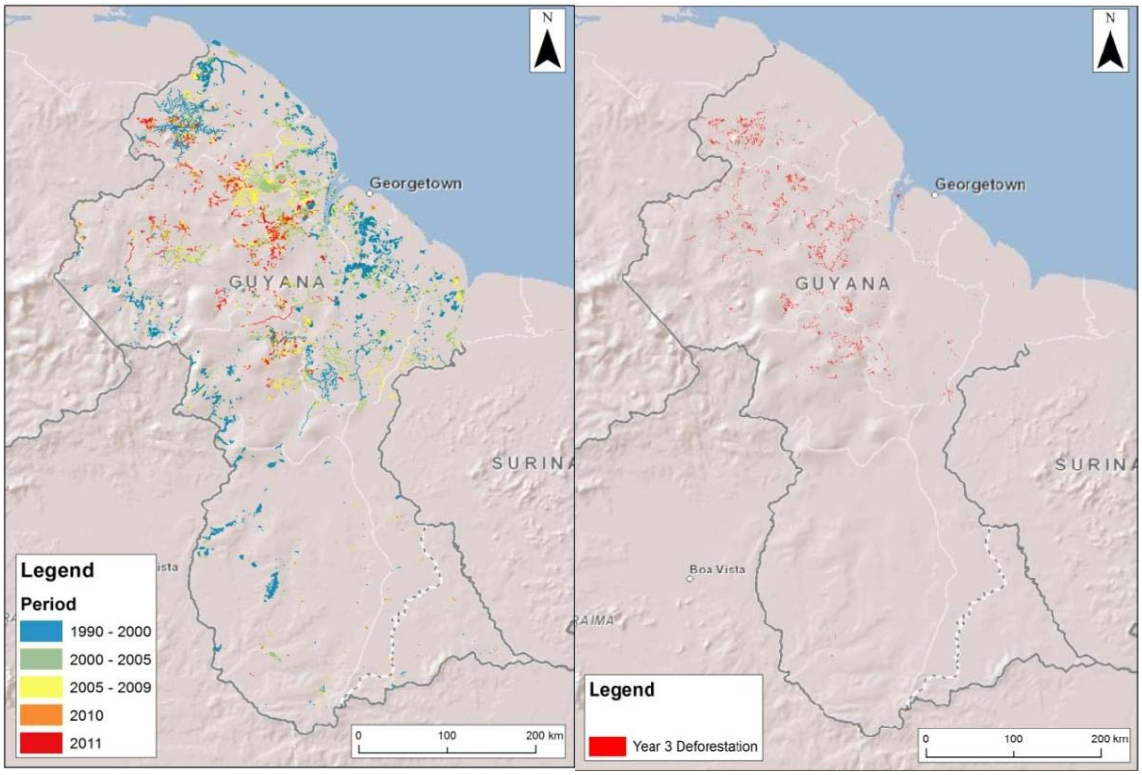
Table 5: Forest Change Area by Period and Driver from 1990 to 2012[49].

Driver	Historical Period			Year 1 2009-10	Year 2 – 2010-11 (15 months)		Year 3 – 2013	
	1990-2000	2001-2005	2006-2009		Deforestation	Degradation	Deforestation	Degradation
	Area (ha)							
Forestry (including forestry infrastructure)	6 094	8 420	4 784	294	233	147	240	113
Agriculture (permanent)	2 030	2 852	1 797	513	52	N/A	440	0
Mining (including forestry infrastructure)	10 843	21 438	12 624	9 384	9 175	5 287	13 516	1 629
Infrastructure	590	1 304	195	64	148	5	127	13
Fire (Deforestation)	1 708	235		32	58	28	184	208
Degradation (year 2) converted to deforestation							148	
Amaila Falls Development					225			
Area Change	21 267	34 249	19 400	10 287	9 891	5 467	14 655	1 963
Total Forest Area of Guyana	18 473 394	18 452 127	18 417 878	18 398 478	18 388 190		18 502 531	
Total Forest Area of Guyana Remaining	18 452 127	18 417 878	18 398 478	18 388 190	18 378 299		18 487 876	
Period Deforestation %	0.01%	0.04%	0.02%	0.056%	0,054%		0.079%	

**Forestry infrastructure accounts for the full total of deforestation from forestry activities.
**Mining Infrastructure accounts for 1,434 ha in year 2012 out of the total deforestation in this category of 13,516 ha.

[49] GFC, December, 2013. Guyana REDD+ Monitoring Reporting and Verification System (MRVS), Year 3 Interim Measures Report – 01 January 2012 – 31 December 2012, Version 3.

The temporal analysis of deforestation from 1990 to 2012 is presented in the map shown in Figure 7. The map presents change from all drivers. The map shows that most of the change is clustered and that new areas tend to be developed in close proximity to existing activities. All Year 3 deforestation activities fall inside the footprint of historical change areas. The distribution pattern also shows that areas of increased activity tend to be clustered around the existing road infrastructure and navigable rivers as both provide accessibility. Historically, very little change has been observed beyond central Guyana.



Historical Forest Change ***Year 3 Forest Change***

Figure 7: Historical and Year 3 Forest Change[50].

Freshwater Ecosystems

The WWF Living Guianas Report (2012) reported that freshwater resources are presumed still to be of high quality in many places within the Guianas, though in certain locations in both urban and rural areas, the surface water quality is under severe stress due to poor sanitary practices, and industrial and mining activities. The report showed that for Guyana, increased levels of mercury in the sediments of parts of the Potaro River Basin appear to have their origin in the placer gold mine activities. The report also showed that in Georgetown and populated areas of the coastlands, surface water contamination occurs from inadequate waste disposal and chemicals used in the production of rice and sugarcane.

Wetlands Ecosystems

There is currently no comprehensive information on the status and trends of wetlands ecosystems in Guyana. In 2006, a study on the state of the North Rupununi Wetlands (*Darwin Initiative Guyana Partnership, 2006*) indicate that the ecological system as measured over the period 2003-2006 was performing wetland functions as would have been expected in healthy wetland systems. The findings also

[50] GFC, December, 2013. Guyana REDD+ Monitoring Reporting and Verification System (MRVS), Year 3 Interim Measures Report – 01 January 2012 – 31 December 2012, Version 3.

highlight that the communities living in the North Rupununi were heavily reliant on natural wetland resources for their livelihood support and social functions.

The WWF-Guianas in 2012 published a study which identified and characterized 23 wetlands sites within Guyana (Table 3 above). The results of the study provided baseline information and preliminary insight into the characteristics of the study sites but did not give insights into the overall status or health of the wetlands studied.

Coastal and Marine Ecosystems

The coastal zone is considered one of the most important natural regions in the country. Over 90% of the population as well as economic and administrative activities are concentrated in this region. Much of the original vegetation of the coast has been removed. The natural landscape of the coastal zone is characterized by cultivated fields and secondary degraded vegetation (Huber *et. al.*, 1995).

The total area covered by coastal zone forest/mangrove forests in Guyana has declined over the past twenty-five years. A recent study[51] on the mapping and inventory of coastal zone forest in Guyana for the period 2004 to 2009 showed that the total forested area of Guyana's coastal zone forest was estimated at 22,632 ha (55,925 acres). According to the study, the forested area estimated for the period is less than the previous FAO estimates reported in 1990 at 91,000 ha and Steege in 2001 at 80,432 ha. Figure 8 shows the map of the coastal forest zone.

Guyana's marine ecosystem, and by extension the marine ecosystems of the Guianas, is part of the North Brazil Large Marine Ecosystem considered a highly productive ecosystem with moderately diverse food webs. The high productivity of marine habitats of the Guianas is related to the high diversity and abundance of marine species it contains[52]. Additionally, many river plumes including that of the Amazon River and other major rivers, such as the Corentyne and Essequibo Rivers enrich the marine habitats along the coast of the Guianas with nutrients.

[51]Report on the Mapping and Inventory of Coastal Zone Forest in Guyana, South America, August 31, 2011. Prepared by Haimwant Persaud on behalf of the Guyana Mangrove Restoration Project.

[52] World Wildlife Fund (WWF)-Guianas, 2012. Wetlands of Guyana – An insight into the ecology of selected wetlands with recommendations from WWF-Guianas.

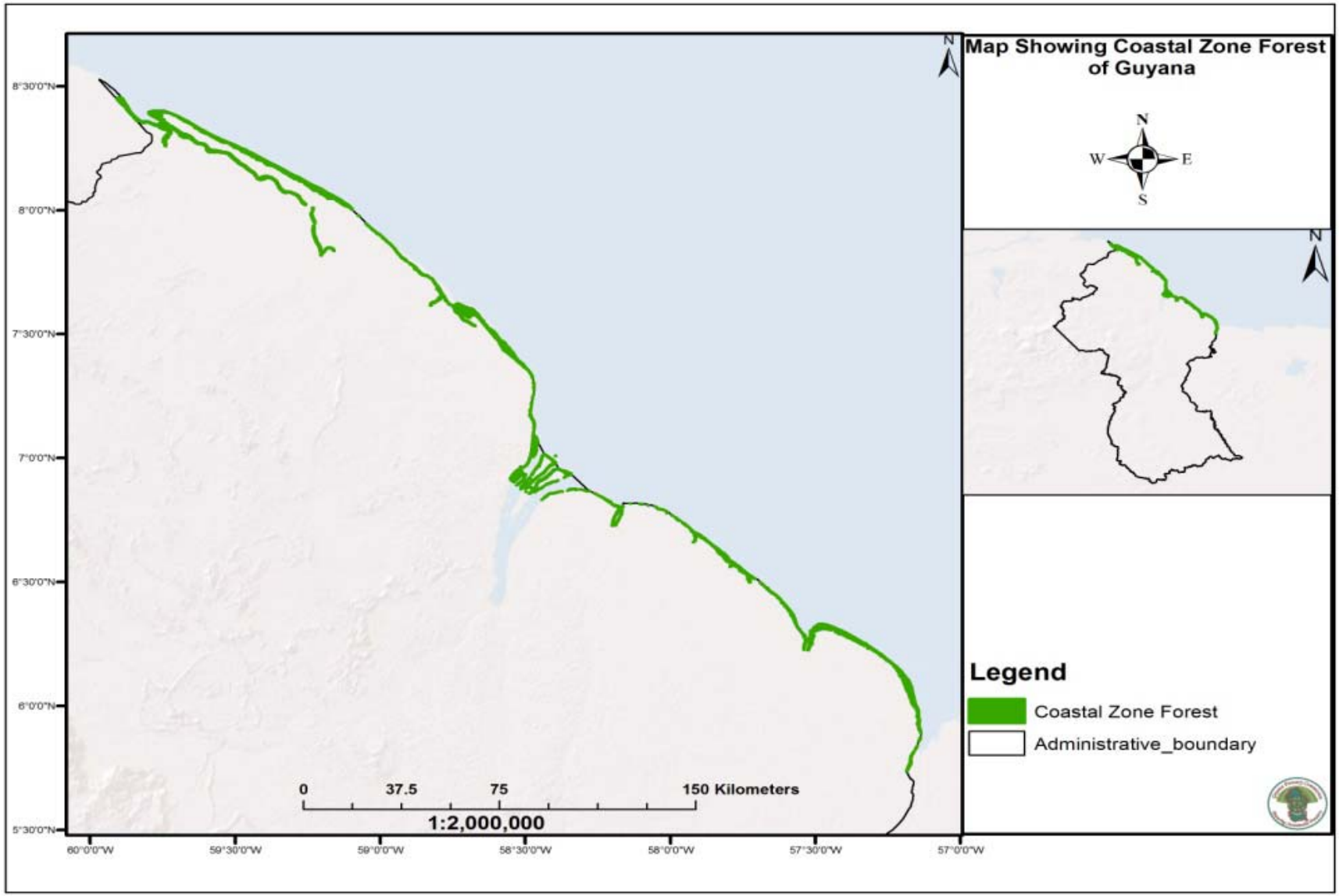


Figure 8: Map showing coastal zone forest of Guyana.

Plant Genetic Resources for Food and Agriculture (PGRFA)

According to Guyana's 2nd National Report on PGRFA to the FAO in 2012, *in-situ* plant species diversity is associated and strongly manifested in homestead cultivations and subsistence farming communities. The PGRFA diversity found in homestead communities represents the greatest diversity of PGRFA assembled in Guyana, accounting for more than 80% of the plant species diversity for food and agriculture during the reporting period.

With regard to *ex situ* plant species, the report indicated that Guyana maintained a rice core collection of approximately 43 parental lines that were used in pedigree breeding. A collection of 43 commercial sugarcane varieties was maintained of which 12 were under industrial cultivation.

During the reporting period, a small nucleus of crop species were maintained on a seasonal basis. These were mostly for green vegetable crop species comprising a core collection of mostly exotic introductions of tomato and *Brassica* species. Local accessions of tomato, bora, pepper, eggplant, and poi were routinely maintained on a seasonal basis. The National Agricultural Research and Extension Institute (NAREI) has several *ex situ* field gene banks, inclusive of pineapple, avocado, cassava, yams, mango, West Indian cherry, passion fruit, cashew, coconut, citrus species, and an array of minor orchard crop species.

3.6 Threats/Pressures

The threats described in the Fourth Report to the UNCBD still apply to the current situation in Guyana. Threats that face Guyana's biodiversity can either be direct or indirect. Direct threats result from developmental or non-human induced activities that directly affect biodiversity and indirect threats can result as a consequence of some policy or legislative measures and/or institutional challenges[53]. Some threats can be viewed as direct threats however they may also have some indirect negative influence on biodiversity. A general (updated) overview of these threats is presented below.

Direct Threats

Direct threats originate principally from:

- overfishing and overhunting on commercial scales;
- savannah and forest fires, in particular, in the Rupununi Savannahs and surrounding forested areas of the Kanuku Mountains;
- indiscriminate land-use practices (mining, logging practices, agriculture);
- hinterland road construction;
- uncontrolled harvesting and poaching of wildlife;
- uncontrolled harvesting of non-timber forest products;
- uncontrolled and inappropriate use of agro-chemicals and other human induced pollution such as indiscriminate disposal of solid wastes both hazardous and non-hazardous;
- climate change events and related natural disasters (the unpredictable weather patterns can affect availability of water and food resources for some wildlife species- key fruiting trees will be affected; more direct impacts may result from flash floods in some hilly regions);
- vulnerability of Guyana's coastal zone to flooding, erosion and salinization (Guyana's coastal zone is as much as 1 m below mean high tide levels of the Atlantic Ocean in some areas. Moreover, global sea level rise is expected to increase from 20 cm to 100 cm by the year 2100);

- introduction of Alien Invasive Species - according to the Global Invasive Species Database (2014[54]), a total of 49 invasive species are known to occur in Guyana. Of these, 18 species are Alien (Introduced), 28 are Native and 3 species with their biostatus not specified. Twenty-three (23)

[53] EPA Annual Report, 2005.

[54] http://www.issg.org/database/species/search.asp?sts=sss&st=sss&fr=1&x=0&y=0&sn=&rn=Guyana&hci=-1&ei=-1&lang=EN.

invasive species are found in agricultural areas, 21 in natural forests, 14 in coastlands, 18 in wetlands and 3 in marine habitats; and
- increased accessibility to and economic activities in hinterland areas – rapid opening up of areas to commercial activity may lead to clash of cultures and practices that may make local people more vulnerable to diseases, etc.

Indirect Threats

Indirect threats originate mainly from:

- climate change events and related natural disasters such as floods and periodic dry spells;
- institutional fragmentation and conflicting legislation;
- limited knowledge on species diversity, range and behaviour;
- insufficient monitoring and enforcement; and
- limited relevant judicial awareness and experience.

Threats to Biodiversity Components

Some of the major direct and indirect threats are listed below with respect to specific biodiversity components. These are:

Forests and savannahs:

- large scale selective logging ("high grading") of certain species;
- fuel wood collection in natural forests;
- unregulated chainsaw operations;
- conversion to agriculture and other uses;
- unregulated and unmanaged exploitation of forest resources in titled Amerindian communities;
- mining (legal and illegal); and
- over-harvesting of resources.

See Table 5 for Forest Change Area by Period and Driver from 1990 to 2012.

Agro-ecosystems:

- shifting weather patterns leading to crop loss;
- use of agro-chemicals;
- management and control of crop diseases; and
- soil erosion.

Inland aquatic:

- loss of aquatic biodiversity resulting from land and river mining;
- degradation of water quality due to mining and agricultural practices;
- introduction of potentially damaging invasive species; and
- over-harvesting of fisheries resources with gill nets and sport fishing.

Marine/ Coastal:
- excessive targeting of certain marine species of fish;
- introduction of seine for fish harvesting;
- degradation of water quality due to contamination from solid and other waste;
- illegal harvesting of mangrove vegetation; and
- poaching of protected species – endangered sea turtles.

Key Emerging Threats/ Pressure

- A threat to the fishing industry is beginning to emerge. A decline in fish catch of 6.5% in 2013 was attributed to overfishing[55].

- The mangrove belt has been severely depleted apparently from heavy damage by human use, rise in sea level and increased wave force[56]. The fringe of natural mangrove along the coast has been reduced to tens of meters wide or zero for some places[57].

- Despite the declining prices on the world market, gold mining continues to increase and significant extraction of gold is expected with two large companies coming into production in the next 1-2 years signaling the potential for increased threats to the environment and biodiversity from chemical use, removal of trees and soil.

- Tourism has become one of the most important economic activities in the world and has been recognized as a major potential sustainable use of biodiversity in the programme structure of the CBD. It is believed that tourists are increasingly interested in visiting unspoiled and less-developed areas with a low tourist density, such as savannahs, rain forests and coral reef. With the recent global exposure as a tourist destination and the increasing visitor arrivals coupled with the absence of a tourism policy and robust standards, Guyana is at risk of incurring negative impacts if the level of visitors is greater than the environment's ability to cope with the level of use.

3.7 Key Achievements, Gaps and Priority Needs

Guyana has progressively taken significant steps toward meeting the obligations of the UNCBD and ensuring conservation and protection of its natural resources. Below is a summary of the key achievements since signing to the Convention:

- Prepared and submitted the previous four National Reports to the Convention. The fifth National Report is currently in development.

- Acceded to the Cartagena (Biosafety) and Nagoya (ABS) Protocols under the UNCBD.

- Key pieces of legislation were enacted to conserve and protect biodiversity including the Environmental Protection Act and Regulations, Wildlife Management and Conservation Regulations, Species Protection Regulations, Protected Areas Act, Forest Act, Litter Prevention Regulations, etc. Wildlife Import and Export, Biosafety and ABS legislations are currently in development.

- National strategies were developed to assist in biodiversity management and protection, including the Protected Areas Strategy and the LCDS.

- National policies were developed including the NFP, National Land Use Policy, Policy Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilization and National Biosafety Framework.
- National Plans were also developed including National Environmental Action Plan, National Biodiversity Action Plan, National Forest Plan, National Protected Areas System Plan, National Land Use Plan and the National Mangrove Management Action Plan.

[55]National Budget, 2014.
[56] National Mangrove Restoration Project - www.mangrovesgy.org/home/index.php/2014-04-27-16-39-08/conservation-status-of-mangroves.
[57] A Situational Analysis of Coastal Mangrove Sites in Guyana (Shell Beach to Mahaica), Bovell, O., Mangrove Specialist, National Mangrove Restoration Project – Guyana 21 May, 2010 http://www.mangrovesgy.org/home/.

- Institutional and governance arrangements were strengthened with the creation of the Ministry of Natural Resources and Environment (MNRE) in 2011 which has as its primary focus the harmonizing of policy and management in the natural resources-based sectors, and better mainstreaming of conservation and environmental management[58].Under this new arrangement, all the following natural resources related Agencies and Commissions are now under the purview of the Ministry:

    - Guyana Geology and Mines Commission;
    - Guyana Gold Board;
    - Guyana Lands and Surveys Commission;
    - Environmental Protection Agency;
    - Guyana Wildlife Division;
    - Protected Areas Commission;
    - National Parks Commission (soon to be merged with the Protected Areas Commission); and
    - Guyana Forestry Commission

    The Protected Areas Commission and the Wildlife Management Authority now play significant roles in ensuring biodiversity conservation and protection.

- Several new committees such as the Mangrove Action Committee, Land Reclamation Committee (LRC) and the National Coordinating Committee for Biosafety are in place at different levels of policy decision-making to encourage and promote the integration of environmental issues, inclusive of biodiversity, into national planning.

- The National Protected Areas System was established along with newly designated protected areas: The Kanuku Mountain Protected Area; and the Shell Beach Protected Area.

- Training in biodiversity is enhanced through the inclusion in the school curriculum, undergraduate and post graduate programmes at UG, specialized training through the Forestry Training Centre and the Mining School, and the involvement of Environmental and Wildlife Clubs.

- There have been several biodiversity studies such as the WWF wetlands surveys[59], WWF South Rupununi Biodiversity Assessment Team Expedition[60] and Biodiversity Assessment of the Rewa Head[61].

- Strengthened monitoring through the National and Community Monitoring, Reporting and Verification System (MRVS) under the LCDS. The MNRE and its agencies have also enhanced their monitoring capacity through the establishment of the EMCD, enhanced technology such as remote sensing, and increase in number of field personnel.

Gaps

The main gaps identified in meeting the obligations of the UNCBD and ensuring conservation and protection of its natural resources are highlighted below:

- Significant progress in policy and legislation has been made. However, no promulgated statement exists which states definitively Guyana's policy on biodiversity. This is critical in providing context and direction for ongoing and future work on biodiversity.

[58] 2012 Annual Report MNRE.

http://www.nre.gov.gy/Annual%20Report/MNRE%20-%20ANNUAL%20REPORT%202012.pdf.

[59] World Wildlife Fund (WWF) - Guianas, 2012. Wetlands of Guyana – An insight into the ecology of selected wetlands with recommendations from WWF-Guianas.

[60] WWF – Guianas Global Wildlife Conservation, 2013. South Rupununi Biodiversity Team Expedition – Oct 22 - Nov 7, 2013.

[61] Pickles, R., McCann, N. and A. Holland, 2009. *Biodiversity Assessment of the Rewa Head.*

- Limited or no awareness of the NBAP. Many of the institutions (over 50%) consulted in the preparation of this NBSAP indicated that they were not familiar with the NBAP. Those that were aware were not utilizing it because some were of the belief that EPA was responsible for its implementation.

- Insufficient coverage of biodiversity in major legislation with the exception of the Wildlife Regulations, Iwokrama International Centre of Rainforest Conservation and Development Act (1996) and the Protected Areas Act (2011). These are the only pieces of legislation to define biodiversity, which is defined as '*the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and ecological complexes of which they are part; this includes diversity within species, between species and of ecosystem*'.

- The lack of quality baseline and trend data about biodiversity has contributed to low knowledge or a definitive status of biodiversity and hence determining where conservation or other biodiversity-related efforts should focus. Quality data and information are essential requirements if progress is to be demonstrated and measured.

- There is an absence of a single, authoritative and scientifically generated source of biodiversity information. There is no evidence that the environmental information being collected (e.g. from EIAs) is being analyzed and reported. Even where information exists, it is not clear if it is being used fully to bring about environmental improvement.

- There is a dearth of data and information related to biodiversity generated by various ministries, agencies, commissions, international and national NGOs and in libraries and universities both in Guyana and abroad. However, this information has yet to be compiled and analyzed to generate the kind of knowledge needed to inform decision-making.

- Mainstreaming of biodiversity in the productive and ecotourism sectors. A myriad of guidelines, codes and manuals exists that set out the standards applicable to forestry, mining, and agricultural operations but many important biodiversity values (e.g. watersheds, soil) are not covered or included.

- There is no prior determination of biodiversity significance of an area before acquiring mining/forestry/agricultural rights to that area.

- Other critical gaps at the institutional level include:

    - need for more coordination and integration among institutions;
    - need for more funding;
    - need for more technical skills and qualified persons for analytical work;
    - need for national publication or information sharing related to biodiversity use and management/studies and to strengthen the system to capture local research and researchers in the process; and
    - need for an agency or institution to be designated as a national repository of all biodiversity related data.

Priority Needs

Guyana's priority needs regarding biodiversity conservation are outlined in several national documents. Priority needs for the implementation of the UNCBD were outlined in previous stocktaking assessments. Most of the priorities identified by various reports prepared and in national documents are outlined in Table 6.

Table 6: Priorities as is outlined in National Documents and Reports.

Priorities	National Documents (e.g.: NDS, MDGs, PRSP)	NCSA UNCBD Report 2007	NBAP II	BEAP* Stocktaking Report 2009
Consolidation of the Policy, Legal and Administrative Framework	✓	✓	✓	✓
Institutional Strengthening/Human Resources Capacity Building/Training	✓	✓	✓	✓
Mainstreaming Biodiversity			✓	
Integrated Land Use Planning			✓	✓
Awareness and Education	✓		✓	✓
Research and Data Collection, Information Sharing and Management	✓	✓	✓	✓
In situ and *Ex situ* Conservation of Biodiversity	✓	✓	✓	
Monitoring	✓	✓	✓	✓
Promoting Sustainable Initiatives in the Agriculture Sector	✓		✓	
Promoting Sustainable Initiatives in the Forestry Sector	✓		✓	
Habitat Destruction and Associated Impacts on Coastal Resources	✓		✓	
Promoting Sustainable Initiatives in the Marine and Inland Water Resources Sector	✓		✓	
Translation of knowledge and awareness		✓		✓
Development of Methods, Criteria and Indicators for the Sustainable Use of Biodiversity	✓	✓		✓
Sustainable livelihoods alternatives	✓	✓		✓
Incentive Measures	✓	✓		✓
Access to Financial and Technical Resources	✓	✓		✓

* Biodiversity Enabling Activities Project

3.8 Opportunities

- With the establishment of the Ministry of Natural Resources and the Environment, there are opportunities for the biodiversity-related Agencies and Commissions to maximize resource use through partnerships, alignment and co-ordination of biodiversity-related work programmes.

- Integrating consideration of biodiversity within the tourism sector. This has the greatest potential for increasing public awareness of the value of biodiversity especially since Guyana was designated by *National Geographic Explorer* as one of the 2014′s must-see places on planet earth.

- Building stronger partnerships with the numerous existing hinterland NGOs and Community Based Organisations (CBOs) would enhance public support for biodiversity. It would allow for opportunities to access the local knowledge, skills and expertise which reside in these organisations thereby strengthening and increasing the current capacity, knowledge and available information on biodiversity.

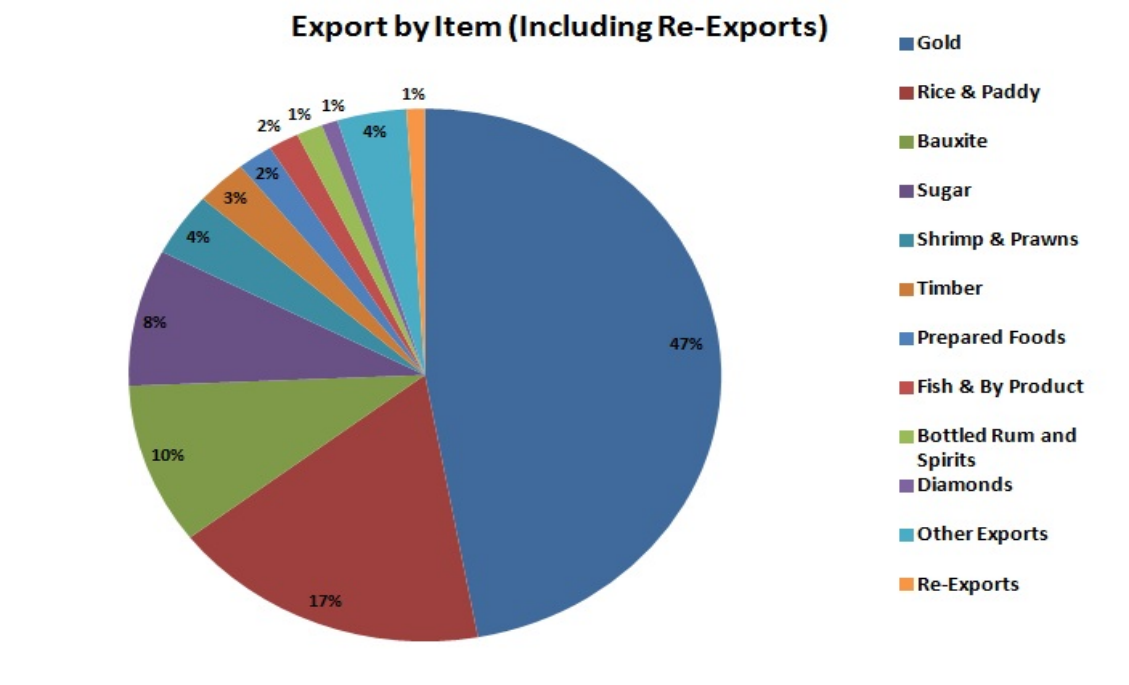
4. KEY INFORMATION WHICH INFORMED UPDATING/REVISION OF THE STRATEGY AND ACTION PLAN

4.1 Importance to the economy

In Guyana, natural resources and biodiversity provide a wide range of goods and services which are critical to the growth and development of the economy and well-being of Guyanese. In 2013, the value of foreign exchange earnings to the Guyana economy shows that more than 95% of the earnings were related to use of natural resources and biodiversity/ecosystem services (Box 3). This is expected to increase in the future with proposed increased investment in agriculture, ecotourism and the extractive sector.

Box 3: Exports by Item (Including Re-Exports).

ITEM	VALUE (US$'000)	CONTRIBUTION (%)
Gold	648,537.6	47.1
Rice & Paddy	**239,826.4**	**17.4**
Bauxite	134,646.3	9.8
Sugar	**114,197.9**	**8.3**
Shrimp and Prawns	53,111.2	3.9
Timber	**38,491.6**	**2.8**
Prepared Foods	26,675.4	1.9
Fish and By-Product	**22,851.8**	**1.7**
Rum & Alcohol	19,700.4	1.4
Diamond	**12,158.2**	**0.9**
Other Exports	52,029.5	3.8
Re-Exports	**13,669.6**	**1.0**
TOTAL	1,375,895.9	100.0



***Source**: Bureau of Statistics, 2014.*
http://www.statisticsguyana.gov.gy/trade.html#partners1

4.2 New development trajectory and priority areas for increased investment and growth

Initiatives being pursued for investment and development within Guyana can affect biodiversity, both positively and negatively. The initiatives which may have implications for biodiversity management are discussed below.

4.2.1 Low Carbon Development

It is recognized globally that forests not only provide timber and non-timber products but also significant ecosystem services required to address the causes of climate change by removing greenhouse gases from the atmosphere (mitigation) but also help in reducing the impacts of climate change (adaptation). Historically, these services were taken for granted and not valued. In a 2008 policy decision, the GoG, signaled its intention and commitment to embark on a climate resilient low carbon approach to development.

For the past six years, the GoG has worked at the multilateral level to establish a Reducing Emissions from Deforestation and Forest Degradation (REDD+) framework through which Guyana is paid for forest climate services its forest provides and which has set the stage for payments for forest conservation and sustainable forest management. To date (2014), Guyana has earned three consecutive payments from Norway totaling US$115 million within the policy framework of the LCDS. In the last quarter of 2013, the annual third party audit of Guyana's performance under the partnership established with Norway was completed, clearing the way for a fourth payment[62].

4.2.2 Increased investment in Ecotourism for growth and job creation

Guyana's biodiversity has had immense regional (CARICOM) and international exposure through the winning of regional awards and international acclaim as an ecotourism destination.

For the last three years (2011-2013), Guyana has dominated the Caribbean Tourism Organization (CTO) /Travel Mole Sustainable Tourism Awards which recognize individuals, groups, organizations or companies in any of the CTO Member Countries which have developed unique and attractive tourism products or are engaged in implementing sustainable tourism-related initiatives which embrace sustainable tourism concepts and core values. Guyana has won awards for sustainable tourism, heritage protection, biodiversity and community benefit.

In the international arena, *National Geographic Traveler* in 2011pegged the "Amerindian Guyana" trip offered by Wilderness Explorer, a national tour operator, as the world's best in their annual feature"50 Tours of a Lifetime". *Traveler* also named the indigenous owned and operated Surama Eco-Lodge as one of the best hotels in South America for their 2011 Stay List[63]. In 2014, *Traveler* named Guyana as one of the 2014′s must-see places on planet earth as Guyana offers curious travelers an opportunity to experience one of only four remaining intact rain forest ecosystems on the planet[64].

The contribution of tourism to the national economy has increased over the last 10 years (Table 7). In 2013, visitor arrivals totaled 200,122 reflecting a 13.3 percent over 2012.The GoG has given its commitment to continue to pursue initiatives to ensure the development of a vibrant and sustainable tourism industry, in collaboration with the private sector.

Efforts to increase airlift capacity and expand route options resulted in two new Latin American airlines introducing flights to Guyana in 2014. This increased air travel capacity supplemented the introduction in 2013 of LIAT flights to and from Caribbean countries and Suriname.

[62]National Budget, 2014,
[63]Food and Agriculture Organization (FAO). http://www.fao.org/forestry/country/19971/en/guy/.
[64]Food and Agriculture Organization (FAO). http://www.fao.org/forestry/country/19971/en/guy/.

Additionally, in 2014, hotel room capacity will be given a significant boost with the opening of the 197-room Marriott Hotel. A number of policies will also be developed in an effort to further advance the tourism sector by addressing a number of areas, including cross-border travel through multi-destination packaging, group travel and temporary importation of vehicles for recreational purposes. The Hinterland Tourism Plan will be completed with implementation set to begin in September 2014[17]. With these developments on the horizon, the tourism industry is expected to be a major driver of growth and job creation in Guyana.

Table 7: Guyana Travel and Tourism Total Contribution to Gross Domestic Product.

Guyana	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Travel and Tourism Total Contribution to Gross Domestic Product										
LCU (local currency units) $ billion	22.928	28.154	34.548	37.939	38.21	34.086	42.74	51.455	43.04	47.017
US$ billion	0.116	0.141	0.173	0.187	0.188	0.167	0.21	0.252	0.211	0.227

Source: World Travel and Tourism Council (WTTC). Data generated in May 31, 2014 using the WTTC economic data search tool. http://www.wttc.org/research/economic-data-search-tool/.

4.2.3 Increased projection in growth of the mining (gold) industry

In recent years, Guyana has experienced significant growth in gold production (Chart 1). Declared gold production rose 48% between 2007 and 2011 all from small- and medium-scale production. The increase in declared production coupled with rising prices has led to a rapid increase in the importance of gold in Guyana's economy growing around 30% per year from approximately US $170 million in 2007 to over US $570 million in 2011[65]. In 2013, the gold mining sector once again played an important role in the domestic economy and delivered record breaking production valued at US $648.5 million[66].

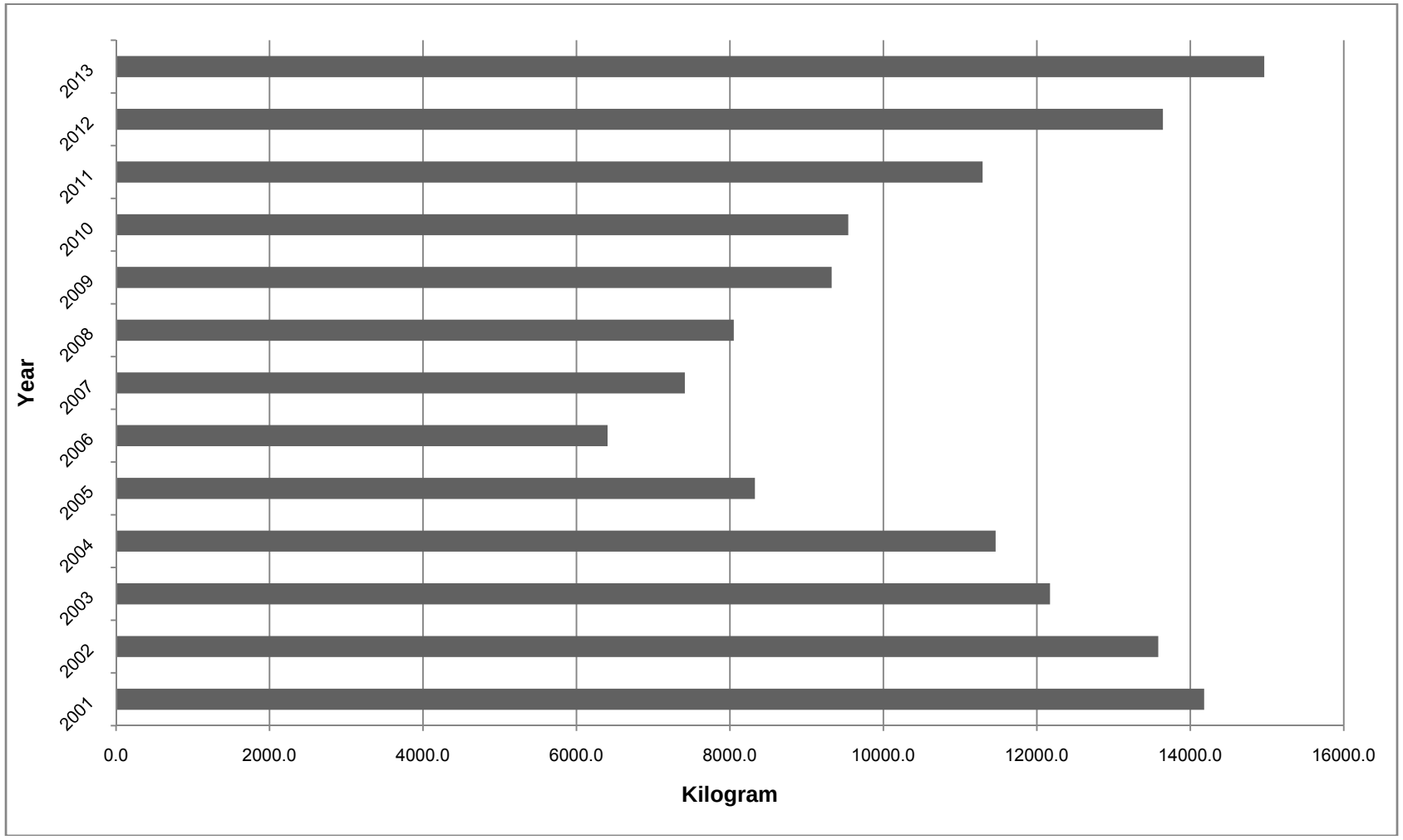
The prospects for large-scale mining for gold in Guyana are still very real as demonstrated investor confidence remained unshaken where large-scale projects for gold are concerned. In 2012, Foreign Direct Investment (FDI) flows into Guyana amounted to US$ 294 million, a 19% rise from 2011. Inflows were concentrated in the mining industry (bauxite and gold), as well as in telecommunication[67].

As of 2012, there was about CDN $600 million worth of investments in mining in Guyana, with some 50 gold mining operations. There are two large companies which are expected to extract three to five million ounces of gold[68].

[65] Guyana's Extractive Industry Sector, 2013. A Synopsis of Issues and Recommendations for the mining sector as a Sustainable Element of Guyana's Low Carbon Development Strategy (LCDS). Contributors Conservation International Guyana – Singh, D., Bernard, C., Rampersaud, P., Laing, T. (Consultant), and D. Balraj; Projekt-Consult GmbH – Priester, M. and T. Hentschel; WWF Guianas – Williams, P., Williams, A., Davis, O., and L. C. Watson (Consultant).
[66] National Budget, 2014.
[67] Foreign Direct Investment in Latin America and the Caribbean, 2012. UNECLAC. http://www.cepal.org/publicaciones/xml/4/49844/ForeignDirectInvestment2012.pdf.
[68] Positive reports on mining development in Guyana – Canada's Foreign Minister visit to Guyana. Guyana Times, August 16, 2012 - http://www.guyanatimesinternational.com/?p=19028.

Chart I: Gold Production.

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Output	14,181.0	13,582.3	12,171.7	11,462.1	8,325.9	6,405.7	7,412.0	8,050.5	9,325.8	9,542.9	11,293.4	13,643.7	14,963.8



Source: Bureau of Statistics - http://www.statisticsguyana.gov.gy/pubs.html

The adoption of innovative technology is unfolding to deal with the issues associated with mercury abatement, improve efficiencies in recovery to offset cost of production and reduce threats to the environment[6].

4.2.4 Increasing threat of land degradation

There are some areas across Guyana that are potentially vulnerable to land degradation (Figures 9 &10). The 2008 land degradation assessment[69] revealed the following:

- land degradation is apparent on forested and mining lands and could be mitigated and/or prevented if appropriate policy mechanisms are instituted in a timely manner;
- land degradation has not received national attention and as such, the extent to which this event is occurring has not been measured. Using some information from the stakeholder entities, the analysts judgment and visual observation, it was found conservatively that current annual degradation ranges between 150,000 and 160,000 hectares, but is projected to increase to between 200,000 and 250,000 hectares over the next 5 to 10 years nationally. This figure may be higher if soil analyses are conducted;
- the nature-based orientation of current tourism initiatives seek to maintain an environment which retains its natural pristine beauty and ecosystem functionality and may be at risk based on the locations of these initiatives (Figure 11).

The NBSAP, therefore, was revised and expanded to reflect the new national development context, the emerging threats to biodiversity and the ecosystems, the strategic approach to biodiversity management, a monitoring and evaluation framework to measure the results and resource mobilization and capacity building frameworks for its implementation.

[69]National Assessment of Land Degradation in Guyana - Diagnostic Report - Lands and Surveys Commission, United Nations Development Programme & Global Environment Facility, 2008.

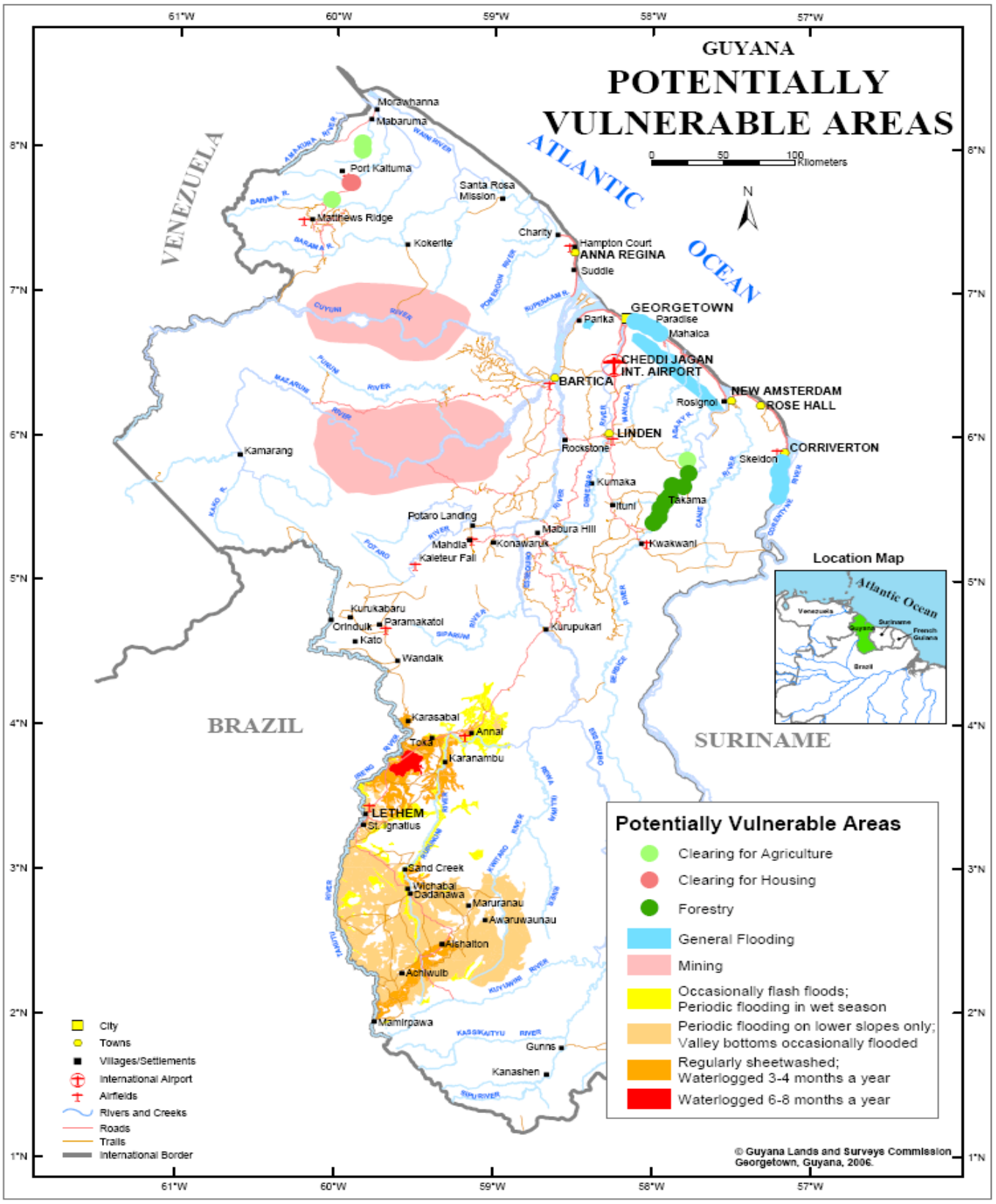


Figure 9: Potentially Vulnerable Areas[70].

[70] *National Assessment of Land Degradation in Guyana - Diagnostic Report - Lands and Surveys Commission, United Nations Development Programme & Global Environment Facility, 2008.*

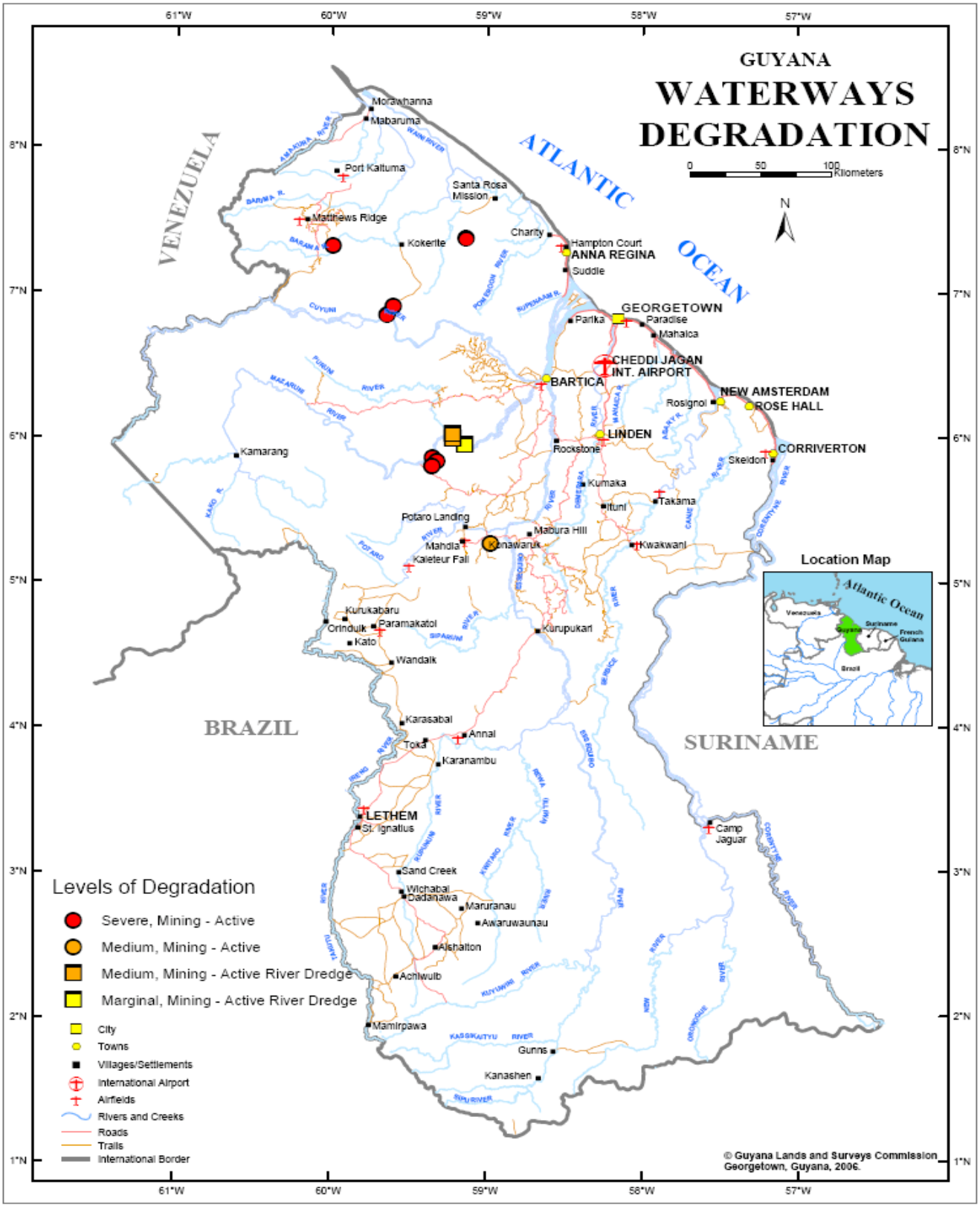
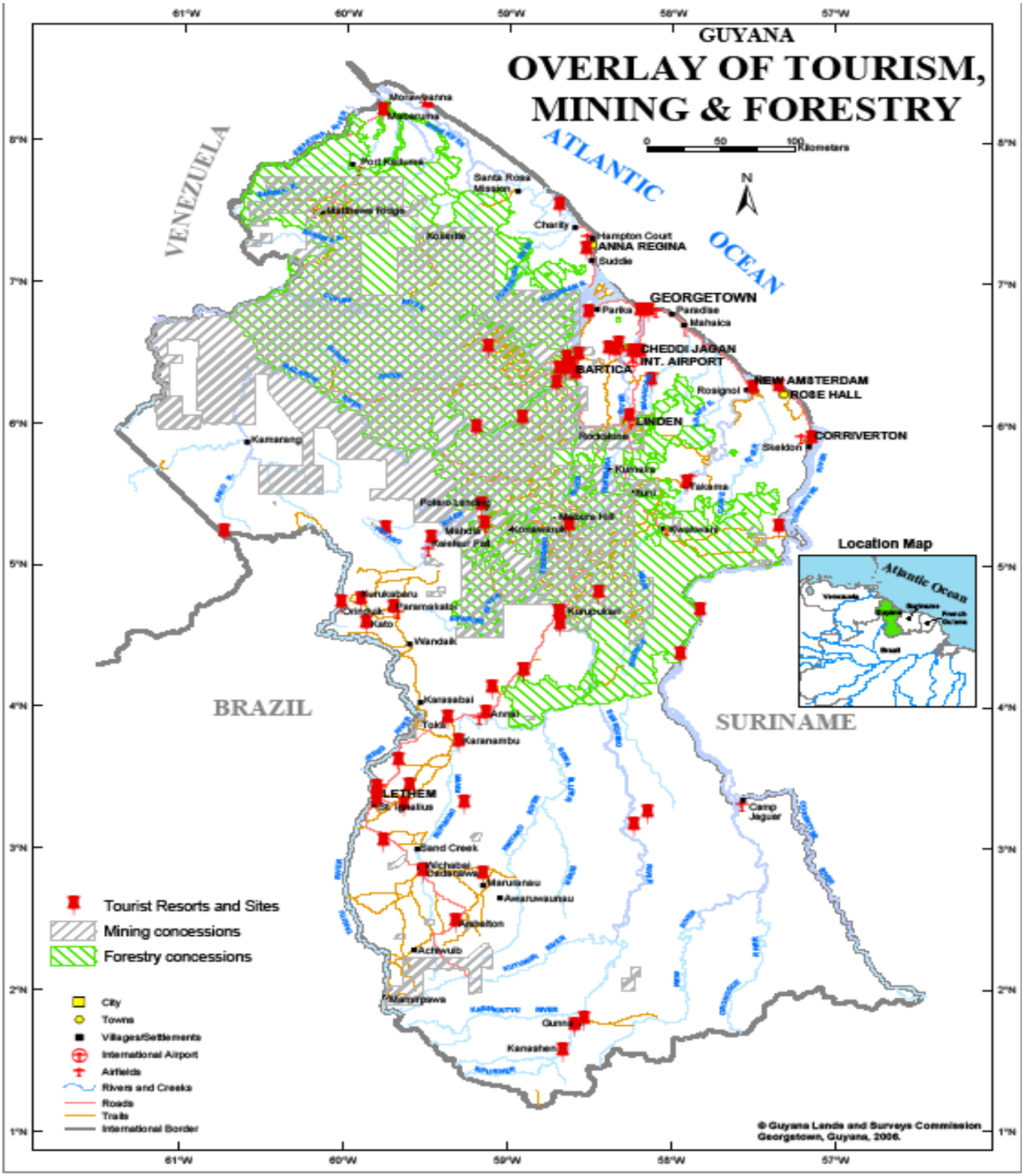


Figure 10: Water Degradation in land units where Mining and Forestry Overlap[71].

[71]National Assessment of Land Degradation in Guyana - Diagnostic Report - Lands and Surveys Commission, UNDP & GEF. 2008.



Source: Guyana Lands and Surveys Commission (2008)

Figure11: Illustrating the presence of some tourism sites within mining and forestry concessions.

5. STRATEGY AND ACTION PLAN

5.1Introduction

Guyana's principal wealth is its natural land, water and offshore resources. The development of the LCDS, made clear the GoG's commitment to re-orient Guyana's economy to a low-carbon, "green" development pathway. The GoG's decision to sustainably manage the forestry resources to derive benefits for the economy and create livelihood opportunities for the people of Guyana has resulted in one of the lowest rates of deforestation in the world. In doing so, a new economic opportunity created through avoided deforestation (REDD+) allowed Guyana to be one of the first countries to benefit from financial incentives.

This Strategy and Action Plan sets out the vision, the roles, duties and obligations of the state and its citizens and the actions to protect, conserve, use sustainably and share equitably the benefits arising from biodiversity. It provides the guidance and support actions for biodiversity, sets out the national priorities and the strategic objectives to be achieved. It allows as well, partners at all levels to better identify how they can contribute and support Guyana in meeting its national biodiversity goals while meeting at the same time, its obligations to the UNCBD.

5.2 Duties and obligations

The duties and obligations of the state and its citizens towards natural resources and the environment are clearly set out in the national constitution Chapter II - Principal and Bases of the Political, Economic and Social System - as follows[72]:

Article 25. ***Every citizen has a duty to participate in activities designed to improve the environment and protect the health of the nation.***

Article 36. ***The well-being for the nation depends upon preserving clean air, fertile soils, pure water and the rich diversity of plants, animals and eco-systems.***

5.3 Roles and Responsibilities

The MNRE will play a leading role in delivering the vision and intended outcomes of the Plan and ensuring that the priority areas identified for action are addressed. As the focal point for the UNCBD, the Environmental Protection Agency (EPA) will coordinate the development of an NBSAP implementation plan which sets out priority activities, lead agents, partners, short- and long-term targets.

It is recommended that the implementation of the NBSAP be coordinated by the EPA as the National Focal Point for the UNCBD. To support the EPA's work, a National Biodiversity Committee, similar to what previously existed as the National Biodiversity Advisory Committee (NBAC) should be established. The Committee should be cross-sectoral and broad-based, including representation from conservation organisations, academia, Government entities in the natural resources and environment sector, the private sector among others with the EPA serving as the Chair/ Convener. The recommendation for this Committee is attached as Appendix I.

[72] Laws of Guyana - http://legalaffairs.gov.gy/information/laws-of-guyana.

6. VISION AND GOAL FOR BIODIVERSITY

Vision: By 2030, biodiversity is sustainably utilized, managed and mainstreamed into all sectors contributing to the advancement of Guyana's bio-security, and socio-economic and low carbon development.

Goal: *By 2020, biodiversity is valued, effectively conserved, protected and restored where appropriate, delivering significant benefits and contributing to climate change mitigation and adaptation in a way that is acceptable nationally and globally.*

7. STRATEGIC OBJECTIVES (SO) OF THIS PLAN

The Strategic objectives of the NBSAP are aligned to the overall strategic objectives of the MNRE. It was considered important to include also an objective related to mobilizing resources for the successful implementation of the Plan.

SO1: Improve the status of biodiversity by conserving ecosystems, species and genetic diversity and by restoring biodiversity and ecosystem services in degraded areas.

SO2: Promote the conservation, sustainable use and value of biodiversity into key productive sectors used for growth, expansion and diversification of the economy.

SO3: Expand and improve awareness, appreciation and communication on biodiversity and ecosystems.

SO4: Improve national implementation, monitoring and reporting for Multilateral Environmental Agreements (MEAs) and other bilateral commitments.

SO5: Create stronger and wider national, regional and international partnerships that contribute to achieving the goal and objectives of this Plan.

SO6: Consolidate/harmonize policy, legal, regulatory, and administrative frameworks that support the sustainable use, protection and management of biodiversity resources.

SO7: Improve substantially biodiversity monitoring at the national level and within key productive sectors.

SO8: Strengthen the knowledge base and capacity for conservation, management and sustainable use of biodiversity.

SO9: Secure adequate resources from national, regional and international sources for the implementation of the Plan.

8. PRIORITY ACTIONS AND TARGETS

Table 8 shows the NBSAP's strategic objectives, priority actions, targets and the Plan's linkages to the UNCBD strategic goals and targets.

Table 8: Strategic Objectives, Priority Actions, Targets and Contribution to CBD Goals and Targets.

CONTRIBUTION TO UNCBD GOALS AND AICHI TARGETS	STRATEGIC OBECTIVES	PRIORITY ACTIONS 2012-2020	LEAD AGENCY	TARGET
Goal C: Target 11 **Goal D: Targets 14 and15**	**SO1:** Improve the status of biodiversity by conserving ecosystems, species and genetic diversity and by restoring biodiversity and ecosystem services in degraded areas.	**SO1.1** Establish more legally protected areas. **SO1.2** Conduct ecological, management effectiveness, sustainable finance, capacity needs, policy, protected area integration and mainstreaming assessments. **SO1.3** Build capacity for planning, establishment and management of protected areas. **SO1.4** Develop and implement resource mobilization plan to ensure financial sustainability of protected areas. **SO1.5** Conduct evaluations of the effectiveness of protected areas management. **SO1.6** Consider benefit-sharing mechanisms with communities surrounding the protected areas. **SO1.7** Conduct a mangrove species mapping and inventory. **SO1.8** Rehabilitate, restore and protect mangrove belts. **SO1.9** Explore new models to combine ecological restoration and the creation of small businesses in mangrove areas. **SO1.10** Assess level of degradation in mined out areas.	PAC PAC PAC PAC PAC PAC Ministry of Agriculture Ministry of Agriculture Ministry of Agriculture GGMC	▪ 17% of terrestrial area for *in-situ* conservation in legal protection by 2020 effectively managed and financially sustainable. ▪ Reducing biodiversity loss and showing recovery by 2020. ▪ By 2020, Protected Areas Trust Fund established, have adequate resources, and fully functioning. ▪ By 2015, at least three (3) mined-out sites have been duly restored and managed. ▪ The Germplasm Facility (Gene Bank) is formalized by end of 2015 in accordance with FAO Germplasm Standards and 1st Report published in 2016.

CONTRIBUTION TO UNCBD GOALS AND AICHI TARGETS	STRATEGIC OBECTIVES	PRIORITY ACTIONS 2012-2020	LEAD AGENCY	TARGET
		SO1.11 Rehabilitate and restore degraded areas with particular focus on mined out areas. **SO1.12** Promote soil health through the prudent utilization of biological, chemical and physical methods in an eco-system agronomic approach. **SO1.13** Strengthen Agriculture In-house and Field Germplasm Facility (Gene Bank) to FAO Germplasm Standards.	GGMC Ministry of Agriculture Ministry of Agriculture	
Goal B: Target 7	**SO2**: Promote conservation, sustainable use and value of biodiversity into key productive sectors used for growth, expansion and diversification of the economy.	**SO2.1** Continue with the process of establishing REDD+ framework. **SO2.2** Develop and establish a National Conflict Resolution/ Grievance mechanism for REDD+. **SO2.3** Promote integrated tourism, hinterland development and biodiversity conservation strategies, where there is potential for these interests to coincide. **SO2.4** Promote the integration of biodiversity concerns into mining. **SO2.5** Develop Guidelines for responsible recreational fishing **SO2.6** Develop better practices in ornamental fish collection and handling guidelines.	GFC GFC EPA EPA Ministry of Agriculture Ministry of Agriculture	▪ By 2020 REDD+ framework established and functioning. ▪ By 2016, a National Conflict Resolution Strategy for REDD+ developed and functional. ▪ By 2020, biodiversity concerns are integrated into hinterland eco-tourism development plans and strategies. ▪ By 2016, a GEF supported project designed to mainstream biodiversity into mining. ▪ Guidelines published and at least 2 awareness and training programs conducted per year.
Goal A: Target 1	**SO3**: Expand and improve awareness, appreciation and	**SO3.1** Develop a communication strategy in support of implementation of the revised Plan.	EPA	▪ The achievement of the intended impact of the full implementation of the

CONTRIBUTION TO UNCBD GOALS AND AICHI TARGETS	STRATEGIC OBECTIVES	PRIORITY ACTIONS 2012-2020	LEAD AGENCY	TARGET
	communication on biodiversity and ecosystems.	**SO3.2** Enhance communication and cooperation between relevant sectors and improve public and sectoral understanding of the value of biodiversity. **SO3.3** Increase children's learning outdoors, and increasing schools' abilities to teach outdoors. **SO3.4** Restructure and reorient the Zoological Park representativeness to highly encourage visitors and enhance informal education through interactive and engaging experiences.	EPA PAC PAC	communication strategy. ▪ By 2020, Coastal Wetlands, Savannahs, Mountain Highlands and Rainforests eco-systems featuring in the Zoological Park.
Goal B: Target 9 **Goal D: Target 16** **Goal E: Target 17**	**SO4**: Improve national implementation, monitoring and reporting for Multilateral Environmental Agreements (MEAs) and other bilateral commitments.	**SO4.1** Prepare in advance for CBD COP meetings. **SO4.2** Submit national reports as required. **SO4.3** Revise the NBSAP. **SO4.4** Develop indicators for monitoring the implementation of the NBSAP. **SO4.5** Establishment of MEAs Committee. **SO4.6** Implement the actions related to the ABS Protocol. **SO4.7** Participate in the project on the Ratification and Implementation of the Nagoya Protocol in the Countries of the Caribbean. **SO4.8** Implement the Policy on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilization. **SO4.9** Implement the actions related to the Biosafety Protocol.	MNRE Designated Focal points for the Conventions EPA MNRE EPA	▪ Fifth national report submitted in 2014. ▪ By 2014, revised NBSAP completed. ▪ By 2015, indicators developed, adopted and being used. ▪ By 2015, MEAs Committee established. ▪ By 2015, a status report on the implementation of MEAs. ▪ By 2015, finalize the ABS regulations.

CONTRIBUTION TO UNCBD GOALS AND AICHI TARGETS	STRATEGIC OBECTIVES	PRIORITY ACTIONS 2012-2020	LEAD AGENCY	TARGET
		SO4.10 Participate in the Regional Project for Implementing National Biosafety Frameworks in the Caribbean Sub-region. **SO4.11** Implement the National Biosafety Framework.		
Goal A: Target 1 **Goal E: Target 19**	**SO5:** Create stronger and wider national, regional and international partnerships that contribute to achieving the goal and objectives of this Plan.	**SO5.1** Support and encourage schools environment clubs, NGOs and CBOs that carry out biodiversity related initiatives. **SO5.2** Develop a biodiversity research interface with the University of Guyana and other academic stakeholders, Conservation International, WWF.	MNRE/EPA MNRE/EPA	▪ By 2016, research interface developed with University of Guyana, Conservation International, WWF.
Goal A: Target 2	**SO6:** Consolidate/harmonize policy, legal, regulatory, and administrative frameworks that support the sustainable use, protection and management of biodiversity resources.	**SO6.1** Review existing legislation to determine the need for further provisions to conserve/use biodiversity sustainably. **SO6.2** Conduct an independent review of the outcomes of Environmental Impact Assessments (EIAs) and their role in protecting biodiversity. **SO6.3** Develop EU Forest Law Enforcement, Governance and Trade (FLEGT) timber legality assurance system for Guyana. **SO6.4** To ensure all developers and operators in mining, forestry and agriculture sector are included in the EPA's environmental authorization process.	MNRE MNRE/EPA GFC EPA EPA	▪ By 2020 all timber for export to the EU will be verified legal and granted a FLEGT license. ▪ By 2020, all developers and operators will secure environmental authorization. ▪ By 2020, develop standards for air and water quality.

CONTRIBUTION TO UNCBD GOALS AND AICHI TARGETS	STRATEGIC OBECTIVES	PRIORITY ACTIONS 2012-2020	LEAD AGENCY	TARGET
		SO6.5 Develop and improve national standards to guide environmental compliance.		
Goal B: Target 5 **Goal A: Target 4**	**SO7:** Improve substantially biodiversity monitoring at the national level and within key productive sectors as well as the private sector.	**SO7.1** Continue to develop the EUFLEGT Voluntary Partnership Agreement (VPA). **SO7.2** Continue the development and implementation of Monitoring Reporting and Verification (MRV) system. **SO7.3** Develop biodiversity indicators for the NBSAP. **SO7.4** Implement better coordinated arrangements to monitor changes in state of biodiversity. **SO7.5** Increase in self-monitoring and reporting by operators.	GFC GFC EPA MNRE/EPA EPA	▪ By 2020, EU-FLEGT VPA in place. ▪ By 2020, MRV system in place and functioning fully. ▪ Biodiversity indicators adopted by 2015. ▪ By 2020, monitoring reports for large projects submitted to the EPA.
Goal E: Target 19	**SO8:** Strengthen the information knowledge base and capacity for conservation, management and sustainable use of biodiversity.	**SO8.1** Compile and consolidate biodiversity data and information from local, international, web based sources, local and traditional knowledge. **SO8.2** Continue forest carbon assessments and monitoring. **SO8.3** Establish common data standards to allow sharing of information between different databases. **SO8.4** Develop a database system for biodiversity which makes data freely available to users. **SO8.5** Identify and define clearly the data and information needed to support decision-making and to meet	EPA GFC MNRE MNRE/EPA MNRE	▪ Clearing House Mechanism fully functional. ▪ By 2020, a biodiversity information system established. ▪ By 2020, an updated and fully functional National Biodiversity Research Information System (NBRIS).

CONTRIBUTION TO UNCBD GOALS AND AICHI TARGETS	STRATEGIC OBECTIVES	PRIORITY ACTIONS 2012-2020	LEAD AGENCY	TARGET
		international commitments to monitor and assess the status of biodiversity.		
Goal E: Targets 19 and 20	**SO9:** Secure adequate resources from national, regional and international sources for the implementation of the Plan.	**SO9.1** Prepare a resource mobilization plan to include both expertise and financial resources. **SO9.2** Increase access to GEF, GSF and other funds designed for biodiversity.	MNRE MNRE/EPA	▪ Resource mobilization plan prepared in 2014. ▪ By 2015, all of the initial GEF SGP allocation programmed. ▪ By 2016, at least 2 biodiversity related projects designed and submitted for GEF Council approval.

9. MONITORING AND EVALUATION APPROACH

The UNCBD requires Parties to take measures for the conservation and sustainable use of biodiversity and to decide how it will meet the Convention's overall goals, objectives and targets. Parties are expected to report not only on the biodiversity status, trends and threats but more importantly, on the effectiveness of their biodiversity strategy and action plans in meeting the goals and objectives of the CBD.

The design and implementation of a monitoring and evaluation programme is therefore critical in assessing not only the progress in implementing this Strategy and Action Plan but also the results achieved.

A Monitoring and Evaluation (M&E) programme will be designed based on the established goal, objectives and targets as set out in this Plan. A creative approach combining traditional and standardized tools (such as questionnaires, focus group discussions, interviews) with other tools (such as storytelling, photo and video monitoring) will be explored. The programme will incorporate and build on monitoring and evaluation frameworks already in place such as the MRV system for forests[73] and previous work undertaken to develop monitoring indicators for forest biodiversity, fisheries, agriculture and mining[74].

The EPA, the Agency responsible for reporting on the state of the environment, would undertake the monitoring of the implementation of the Strategy and Action Plan, the achievement of the objectives and overall impact. The EPA will lead the development of indicators and ensure that the indicators are adopted by 2015.

[73]Guyana Forestry Commission, Dec. 2013. Guyana REDD+ Monitoring Reporting and Verification System (MRVS), Year 3 Interim Measures Report – 01 Jan 2012 – 31 Dec 2012, Version 3.
[74]Indicators of Impacts on Forest Biodiversity Project - State of Guyana's Forest at a Macro-Level Revised Final Report. EPA.

10. CAPACITY NEEDED AND RESOURCE MOBILIZATION FOR NBSAP IMPLEMENTATION

10.1 Capacity Building

Capacity at the national level to ensure the proper management of biodiversity is challenging, with there being a shortage of expertise, weak institutional capacity, continuous loss of expertise and sometimes an inefficient use of existing capacity. To ensure the NBSAP is implemented effectively, measures will have to continue to be implemented to enhance and maintain capacity. Please see Appendix II.

10.2 Technology Needs

Within recent years, technology at the national level has been steadily improving to cater for the needs of institutions to effectively implement their mandate and carry out their responsibilities. Most of the agencies and institutions are now generally equipped with the required technology to implement their mandates[75]. To ensure that adequate technology is available to implement the NBSAP, a Technology Needs Assessment was conducted. The main objective of the Technology Needs Assessment was to ensure that adequate technology is available to implement the NBSAP by assessing the technology currently available and examining the need for additional technology. The findings of this assessment are attached as Appendix II.

10.3 Resource Mobilization

This is the most critical area to ensure the management of biodiversity and the effective implementation of the NBSAP. Resources will need to be sourced to implement the various programme areas. Please see Appendix III.

[75]Views of Stakeholders at the Consultations on the Draft NBSAP.

11. COMMUNICATION STRATEGY FOR NBSAP IMPLEMENTATION

A Communications Strategy was developed with the aim of supporting the actions taken to address priority issues in the revised NBSAP. It has incorporated Communication, Education, and Public Awareness (CEPA) approaches for implementation. Please see Appendix IV.

The EPA has the remit for public education and awareness on biodiversity issues and is the national focal Agency for the Convention (CBD). The EPA communications team will have to play the lead role in the integration of CEPA into the local and national awareness and advocacy efforts to mainstream biodiversity into Guyana's planning and development efforts.

In addition, there is an external constituency, with potential to contribute to the national body of knowledge in relation to biodiversity and threats to it and opportunities for collaboration. These include:

- the Private Sector including the agriculture, mining, forestry and fishing industries, and importers and distributors of agro-chemicals;
- umbrella Organizations of Indigenous Peoples' NGOs;
- private industry with current and established programmes of public education and awareness via the media, e.g. Proper use and storage of chemicals and biological pest control;
- Conservation International-Guyana;
- World Wildlife Fund (WWF Guyana);
- the UN Food and Agriculture Organization;
- the Iwokrama International Centre for Rainforest Conservation and Development;
- Panthera;
- Royal Ontario Museum;
- the Smithsonian Institution; and
- Kew Gardens and Shedd Aquarium.

APPENDIX I: RECOMMENDATIONS FOR COORDINATING STRUCTURE FOR THE NBSAP

It is recommended that the implementation of the NBSAP be coordinated by the EPA as the National Focal Point for the UNCBD with oversight from the MNRE. The EPA, as the National Focal Point, has as its primary function to act as the liaison with the Convention Secretariat on behalf of the country and, in so doing, is responsible for:

- receiving and disseminating information related to the Convention;
- ensuring that Guyana is represented at meetings under the Convention;
- identifying experts to participate in ad hoc technical expert groups, assessment processes and other processes under the Convention;
- responding to other requests for input by Parties from the Conference of the Parties and the Secretariat;
- collaborating with national focal points in other countries to facilitate implementation of the Convention; and
- monitoring, promoting and/or facilitating national implementation of the Convention.

To support the EPA's work, a National Biodiversity Committee, similar to what previously existed as the National Biodiversity Advisory Committee (NBAC) should be established. The Committee should be cross-sectoral and broad-based, including representation from conservation organisations, academia, Government entities in the natural resources and environment sector, the private sector among others with the EPA serving as the Chair/Convener. It is important that such as Committee be established since it has been recognized that the responsibility of biodiversity management is wider than that of the EPA and other institutions have critical roles to play.

The Committee could assist the EPA in the coordination of implementation of the NBSAP as well as provides technical advice and support on policies, strategies and programmes for biodiversity conservation and management.

The functions of the proposed National Biodiversity Committee should include:

- support the EPA in coordinating the implementation of the NBSAP;
- support the EPA in ensuring that activities to satisfy the requirements of the UNCBD and its Protocols are implemented;
- monitor and evaluate the implementation of the NBSAP;
- provide technical advice and support on policies for the identification, monitoring, conservation and management of biodiversity;
- provide advice to the EPA on strategies, plans and programmes for biodiversity conservation, management and monitoring;
- advise EPA on priorities for biodiversity research, conservation, management and monitoring; and
- perform advisory and other related functions pertaining to biodiversity matters of concern.

The National Biodiversity Committee should be broad–based and cross–sectoral, including government institutions, NGOs and individuals. As such, the following should be included in the National Biodiversity Committee:

- Environmental Protection Agency – Chair;
- Ministry of Natural Resources and the Environment;
- Guyana Forestry Commission;
- Guyana Lands & Surveys Commission;
- Protected Areas Commission;
- Wildlife Management Authority;
- Ministry of Agriculture (Fisheries and Quarantine Departments);
- National Agricultural Research Extension Institute;
- Conservation International – Guyana;

- Iwokrama International Centre for Rainforest Conservation and Development;
- World Wildlife Fund – Guyana;
- University of Guyana (School of Earth & Environmental Studies and Department of Biology);
- Ministry of Amerindian Affairs;
- Ministry of Foreign Affairs;
- Private Sector Commission; and
- Two Technical Experts in their individual capacities.

The proposed National Biodiversity Committee can be divided into sub-committees to focus on specific areas such as those required under the Protocols of the UNCBD. In this regard, the already existing National Coordinating Committee on Biosafety and Biosecurity, which was resuscitated to assist with the further development of biosafety and biosecurity initiatives being pursued, should be incorporated under the National Biodiversity Committee as a sub-committee. Likewise a sub-committee should be established to assist with initiatives being pursued relating to Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS). Other sub-committees could also be established to deal with other programmes areas and initiatives, such as information exchange and sharing, research, public awareness and education, etc. These sub-committees should be determined by the National Biodiversity Committee.

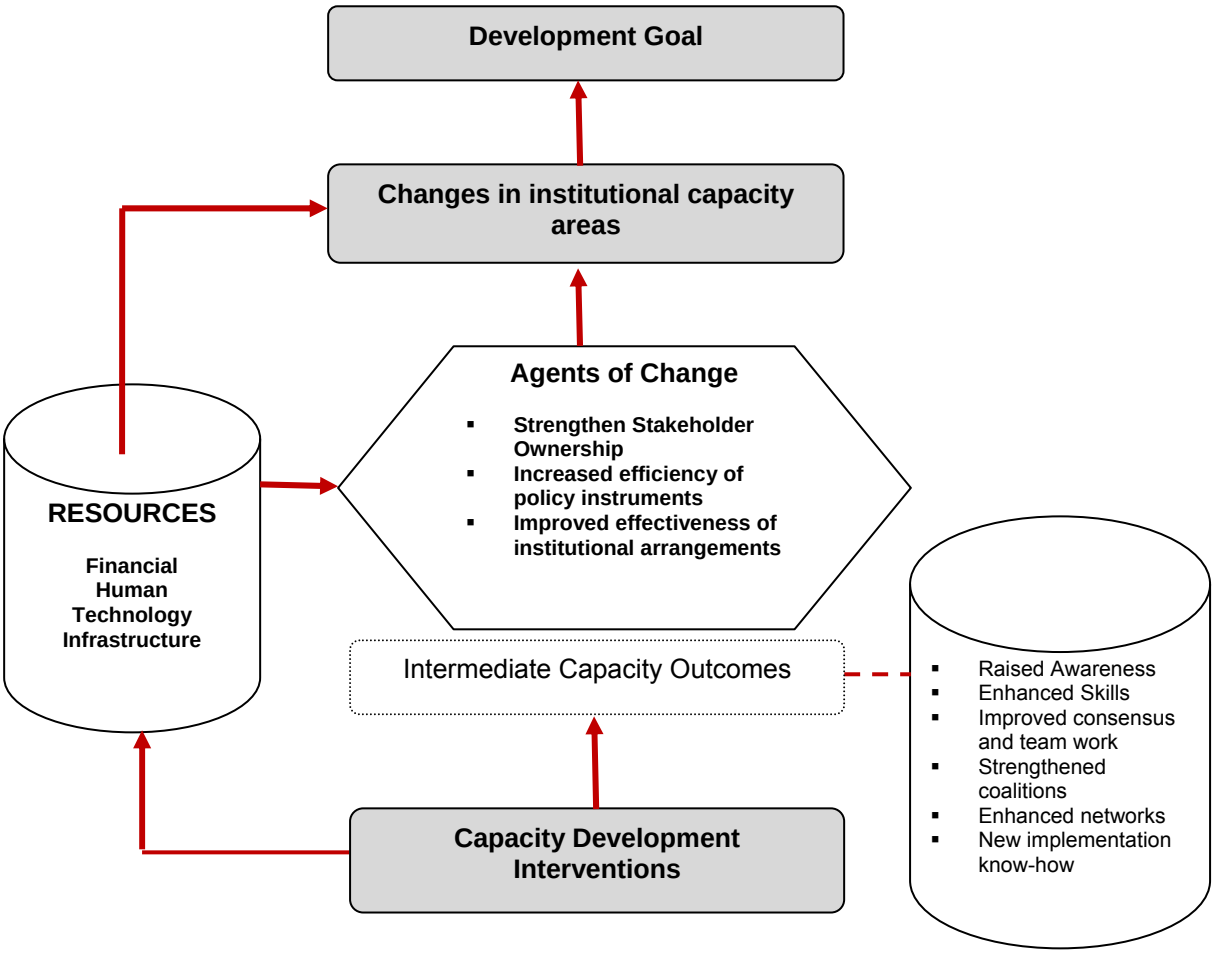
This Committee will ensure that issues such as coordination, effective communication, access to and sharing of information, work programme integration, needs and requirements of all stakeholders, etc. are addressed so as to allow for effective implementation of the NBSAP. In addition, having a National Biodiversity Committee in place will contribute to efficient planning, use of limited human and technological resources and expertise which exist at the institutional level, as well as facilitate awareness and buy-in. However, for such a Committee to be effective, there should be willing and active participation by stakeholders who are committed to the management and conservation of Guyana's biodiversity. The work of the Committee can also be integrated into the work programme of the institutions and there may be the need for regulatory support. It should be noted that it was the view of stakeholders that the previous committee structure facilitated better coordination and implementation than the current fragmented system and, as a result, the implementation of the first NBAP was more successful than NBAP II, and in this regard, a similar committee is being recommended.

APPENDIX II: CAPACITY DEVELOPMENT PLAN AND TECHNOLOGY NEEDS ASSESSMENT

Introduction

Capacity development entails the purposeful use of knowledge and information to achieve capacity outcomes. These outcomes enable local agents of change[76] to trigger or advance positive changes that contribute to the achievement of a particular development goal. Figure 1 shows the building blocks of the capacity development process.

Figure 1: Capacity Development Process[77].



This Capacity Development Plan lays out the capacity development interventions required to advance positive changes that will contribute to the achievement Strategy's goal. The principal objective of the Plan is to provide a comprehensive framework to improve the effectiveness of institutional capacity arrangements for the implementation of the Strategy and to (1) strengthen stakeholder ownership, and (2) increase the efficiency of the NBSAP.

[76] A change agent is an individual or group that initiates or manages needed change(s) for developing institutional capacity in relation to a particular development goal.

[77] Guide to Evaluating Capacity Development Results - A collection of guidance notes to help development practitioners and evaluators assess capacity development efforts; World Bank Institute Capacity Development and Results; World Bank Institute; 2012.

Capacity Building Needs

Capacity at the national level to ensure the proper management of biodiversity is challenging, with there being a shortage of expertise, weak institutional capacity, continuous loss of expertise and sometimes an inefficient use of existing capacity.

The priority capacity development actions needed to better address biodiversity actions and related work of the Strategy was determined through the review of past national reports on capacity assessment, in addition to stakeholder feedback obtained during the NBSAP consultation process. The reports reviewed included the national capacity self assessment related to the UNCBD in 2006, the assessment of capacity buildings needs for national biodiversity priorities in 2009, and the sustainable land management capacity assessment and stocktaking in 2005. The latter was included since it has several cross cutting issues relating directly to the protection, conservation, use and management of Guyana's biodiversity.

Capacity Development Interventions

A number of approaches will be utilized to optimize the use of existing capacity and to ensure that the additional required capacity is developed for the implementation of the NBSAP. The approaches recommended include the efficient use of existing capacity; capacity strengthening within institutions; and, strategic partnerships and collaboration amongst agencies.

The following are actions that Guyana should take to enhance capacity for the implementation of the NBSAP:

- an assessment of existing skills available should be conducted within Institutions, including regional and local government bodies and should include an analysis of skills requirements and gaps, and opportunities for linkages and sharing of skills amongst institutions;

- training and capacity building should be a built-in component of project development, especially the "learning by doing" approach, not only for executing agencies but also committee members and sector agencies;

- incentives to retain qualified, trained and experienced personnel should be explored, both within institutions and within the country;

- regular capacity building exercises should be conducted within and amongst institutions. Establish a list of capacity building activities based on established national priorities and skills assessment, and agreed on by stakeholder institutions;

- a structured programme to improve the technical capacity of staff of government agencies and other institutions should be developed. This programme should cover areas related to the UNCBD and, in particular, biodiversity assessment and monitoring, proposal writing, analysis of data, research methods, development of policy frameworks and public communication on biodiversity issues. The proper use of the technology required should also be included;

- the capacity of the NRMD of the EPA should be reorganized and expanded to adequately implement/coordinate all the programme areas under the UNCBD;

- the ESIA process and guidance should be updated and expanded to effectively promote the protection of biodiversity and the sustainable management of living natural resources at all levels of project development including the exploratory and project closure phases;

- an assessment of the University of Guyana (UG) Undergraduate and Graduate Programmes to integrate the UNCBD and its Protocols as part of the course work should be conducted. UG should ensure that all 'natural science and resource management, social science and technology' related disciplines be conversant with the National Plans and Strategies and the Multilateral Environmental

Agreements (MEAs) and their implications for the sectors. Additionally, consideration should be given to develop a special course or programme in Indigenous Science and to have greater inclusion of traditional knowledge in the management of biodiversity. Consideration should also be given to update programmes given the current national development thrust in order to fill required skill(s) gaps. These can be done as a part of the current Science and Technology Project where relevant programmes curriculum are being revised/developed to align with the Low Carbon Development Strategy (LCDS);

- biodiversity research activities at UG should be strengthened, in particular to have student theses focus on key biodiversity information needs; having students exposed to research and fieldwork earlier in the programmes; expanding collaboration with external agencies for sourcing expertise; and increasing efforts at project proposals preparation to secure funding. Research should be conducted by UG in biodiversity-related areas, especially under the current Science and Technology Project, which provides funding for projects relating to the LCDS;

- the research list available at the EPA and the Guyana Forestry Commission (GFC) should be updated and the research needs prioritized. This list should be shared with UG, in particular, the Faculties of Natural Sciences, Agriculture, Forestry, Technology and social sciences, and the Centre for the Study of Biological Diversity (CSBD). Consideration should be given to establish partnership with the private sector in developing research projects;

- the Ministry of Education should develop and implement a structured programme on biodiversity and the environment in schools. The current school environmental clubs initiative should be reviewed, enhanced and expanded;

- as a part of the public awareness and education programme, technical information should be transferred into simple and understandable language, inclusive of a programme to disseminate information by public media and institutions;

- capacity enhancement in biodiversity related activities at the civil and community levels should be targeted. Current initiatives should be targeted, such as the community monitoring, reporting and verification system (CMRV), wildlife clubs, NGOs, etc. Effectively implement the Communication Strategy prepared for the NBSAP. The lack of awareness related to the UNCBD and Guyana's obligations under the Convention demonstrates the urgent need to increase awareness in this area;

- partnerships with regional and international organizations should be pursued to enhance capacity, especially in the provision of resources and expertise; and

- specific training for border and customs inspectorate on Genetically Modified Organisms (GMOs), quarantined plants and animals, etc. should be conducted.

In keeping with the mechanism for coordinating the implementation of the NBSAP 2012-2020, the MNRE through the EPA, will be expected to coordinate the implementation of capacity development actions. In instances where the Priority Actions may be implemented by other State or Non State Entities, the MNRE, through the EPA, would be expected to lend support.

Table 1 below summarizes the priority actions, the coordinating/lead agency and other state and non-state partners involved in the implementation of priority actions, and the implementation timeframe.

Table 1: Priority Capacity Development Actions, Implementation Time Frame and Responsibilities.

PRIORITY ACTIONS	LEAD AGENCY	TIME FRAME	PARTNERS
Conduct an assessment of existing skills available within Institutions, including regional and local government bodies. The assessment should include an analysis of skills requirements and gaps, and opportunities for linkages and sharing of skills amongst institutions.	MNRE/ EPA	2014-2015	Relevant State Agencies
Training and capacity building should be a built-in component of project development, especially the "learning by doing" approach, not only for executing agencies but also committee members and sector agencies.	MNRE/ EPA	2014-2020	Relevant State Agencies and Non-State Agencies
Incentives to retain qualified, trained and experienced personnel should be explored, both within institutions and within the country.	MNRE/ EPA	2014-2020	Relevant State Agencies
Regular capacity building exercises conducted within and amongst institutions. Establish a list of capacity building activities based on established national priorities and skills assessment, and agreed on by stakeholder institutions.	MNRE/ EPA	2014-2020	Relevant State Agencies and Non-State Agencies
Develop a structured programme to improve the technical capacity of staff of government agencies and other institutions.	MNRE/ EPA	2014-2015	Relevant State Agencies
Reorganize and expand the capacity of the BMD of the EPA to adequately implement/coordinate all the programme areas under the UNCBD.	MNRE/ EPA	2014-2015	
Update and expand the ESIA process and guidance to effectively promote the protection of biodiversity and the sustainable management of living natural resources at all levels of project development including the exploratory and project closure phases.	MNRE/ EPA	2014-2015	
Conduct an assessment of the University of Guyana (UG) Undergraduate and Graduate Programmes to integrate the UNCBD and its Protocols as part of the course work.	UG	2014-2015	MNRE/ EPA
UG to conduct research in biodiversity-related areas, especially under the current Science and Technology Project, which provides funding for projects relating to the LCDS.	UG	2014-2020	MNRE/ EPA
Update and prioritize the research list available at the EPA and the GFC.	MNRE/ EPA/ GFC	2014/2015	UG/ CSBD/ Private Sector
The Ministry of Education (MOE) to develop and implement a structured programme on biodiversity and the environment in schools.	MNRE/ EPA/ MOE	2014-2020	Schools, environmental clubs, etc.
As a part of the public awareness and education programme, technical information to be transferred into simple and	MNRE/ EPA	2014-2020	Relevant State Agencies and Non-State

PRIORITY ACTIONS	LEAD AGENCY	TIME FRAME	PARTNERS
understandable language, inclusive of a programme to disseminate information by public media and institutions.			Agencies
Capacity enhancement in biodiversity-related activities at the civil and community levels to be targeted.	MNRE EPA	2014-2020	Relevant State Agencies and Non-State Agencies, Civil Society
Partnerships with regional and international organizations to be pursued to enhance capacity, especially in the provision of resources and expertise.	MNRE/ EPA	2014-2020	Regional and International organizations
Conduct specific training for border and customs inspectorate on Genetically Modified Organisms (GMOs), quarantined plants and animals.	MNRE/ EPA	2014-2020	MOA, NAREI, GRA

Technology Needs Assessment

Within recent years, technology at the national level has been steadily improving to cater for the needs of institutions to effectively implement their mandate and carry out their responsibilities. Most of the agencies and institutions are now generally equipped with the required technology to implement their mandates[78].

The primary objective of the Technology Needs Assessment is to ensure that appropriate technology is available to implement the NBSAP. The assessment was conducted as part of the national stakeholder workshop to review the draft NBSAP through a working group established to address, *inter alia*, technology needs for the implementation of the Strategy. The group's work focused on determining the technology currently available and examining the need for additional technology.

Assessment Findings and Recommendations

Feedback from stakeholders indicates that generally, the technology required for the effective implementation of the NBSAP is available within the various institutions. However, some specific priority needs and recommendations were made as is outlined below:

- There is urgent need to encourage and expand the use of Geographic Information System (GIS) ready datasets and use of Geospatial technologies and spatial analyses in biodiversity research and related work. Geographic Information (GI) current use in Guyana is concentrated in the natural resources and environment sectors for use in land boundary demarcation, overlays and monitoring.

- Related to the use of GIS in biodiversity research and related work, there is the need for the building of a National Spatial Data Infrastructure that will, *inter alia*, enable and encourage the sharing of GIS datasets and Geospatial technologies amongst governmental organizations and other stakeholders involved in natural resources development and biodiversity research.

- There is a need for more inter-agency collaboration and sharing of technology amongst these institutions, especially since all the agencies may not have the same level of resources and technology available.

- A functional Biodiversity Clearing House Mechanism should be in place.

[78]Views of Stakeholders at the National Consultation on the Draft NBSAP.

- There may be the need for more office equipment such as computers and software and scientific equipment such as microscopes within some institutions.

- Improvement in laboratory facilities and housing to facilitate proper analysis and better storage of germplasm and specimen is needed.

- Computers and internet facilities are required for some hinterland communities.

- Personnel should be adequately trained in the use of equipment and technologies.

APPENDIX III: RESOURCE MOBILIZATION PLAN

Introduction

Mobilizing resources is an essential component not only to the implementation of any programme but also to the achievement of the desired results. Table I shows the new terminology associated with resource mobilization and examples of different types of resources[79].

Table 1: New Resource Mobilization Terminology and Different Types of Resources.

Resource mobilization (RM) – has come to replace the more traditional and narrow term 'fundraising', where 'resource' refers not only to funds, but also to human resources, goods and services. **Resource partner** – replaces 'donor', where 'partner' emphasizes the value of equal partnership/strategic alliance between resource provider and programme implementer.		
Examples of different types of resources		
Financial resources	**Human resources**	**Goods and services**
■ Government budget	■ Seconded from ministries and other government bodies	■ Vehicles, computer equipment, office space or event venues
■ The wider UN system	■ Recruited by international agencies	■ Event sponsorships
■ Grants from international development agencies	■ Associate professional officers (APOs), volunteers, or interns etc.	■ Design and print facilities, communication facilities, airtime (radio or tv)
■ Loans from international financial institutions (IFIs)	■ Local partners	■ Training or advice services e.g. financial, technical or medical
■ Foundations or the private sector		■ Specialist equipment

This Resource Mobilization Plan supports the implementation of the NBSAP (2012-2020). The principal objective of the Plan is to ensure there is a diverse portfolio of resources for the successful implementation of the Strategy and to (1) ensure a better update and distribution of existing funds for biodiversity; (2) rationalize available resources and maximize co-benefits of various sources; and (3) to identify and explore the possibilities of forming strategic partnerships with providers of different types of resources.

Aggregating Contributions and Budgets

There has been no aggregation of funds specifically directed to biodiversity actions and as such there is no financial data to determine trends in contributions and inflows. However, annual budget support is received by several agencies/institutions to implement annual workplans which may include biodiversity-related work. It is, therefore, difficult to determine an indicative budget for achieving specifically the NBSAP (2012-2020) Strategic Objectives and implementing the Priority Actions. It would be strategic therefore to identify current resources used for biodiversity-related work, identify resource gaps and needs, assess the potential for resource mobilization in country, from international donors, from innovative financing mechanisms, and assess potential partners and new approaches to building partnerships for resource mobilization.

[79] A Guide to Resource Mobilization. Promoting Partnership with FAO, 2012. http://www.fao.org/docrep/016/i2699e/i2699e00.pdf.

Mobilizing Resources

A number of approaches will be required to raise the level of contributions to support biodiversity actions. Existing sources of financial, technical and other support would need to be examined and these include Official Development Assistance (ODA); national budget allocations; non-governmental organizations, foundations, and academia; international financial institutions; United Nations organizations, funds and programmes; Non-ODA public funding; South-South cooperation initiatives; and Technical cooperation. In addition, securing support from the private sector and exploring in-kind support would also be critical.

There is a number of resource mobilizing actions Guyana should take as follows:

Direct

- Advocate for increased allocations from the national budget to support the BM Division of the EPA.

- Securing financing for biodiversity-related initiatives and projects through the Guyana REDD+ Investment Fund (GRIF), which is a multi-contributor trust fund for the financing of activities identified under the LCDS.

- Maximizing access to funds allocated through the Global Environment Facility (GEF) and United Nations organizations, funds and programmes.

- Build on and expand opportunities for ODA, e.g. the KfW financed National Protected Areas Systems Project.

- Expand programme of support for biodiversity activities from NGOs, foundations and academic institutions. Conservation International, World Wildlife Fund, Smithsonian Institute, Iwokrama and others have supported and also executed projects which have contributed to meeting biodiversity conservation objectives.

- Expand community-based biodiversity and livelihood projects and activities through developing partnerships GEF Small Grants Programme and other small-scale funding windows of other bilateral partners to support on-the-ground community actions.

- Establish and or enhance partnerships and linkages with regional organizations and programmes.

Indirect

- Undertake joint and synergistic programming across these 3 GEF focal areas (e.g., joint programme on biodiversity and climate change; joint programme on biodiversity and land degradation).

- Enhanced cooperation and coordination of initiatives that would lend to achieving the NBSAP Strategic Objectives and Priority Actions. These could include initiatives being undertaken by other sector Agencies, e.g. the rehabilitation of mined out areas and re-vegetation; and, regional initiatives such as the Guiana Shield Facility.

- Explore market-based instruments (such as economic incentives, fiscal instruments, environmental certification schemes, labeling/branding and green public procurement) that have the potential to support the conservation and sustainable use of biodiversity, as well as improve the sustainability of supply chains.

- Promote the development and use of innovative financing mechanisms, including market-based instruments. Payments for Ecosystem Services schemes could reward public and private goods from agricultural, forest and marine ecosystems.

Coordination and Disbursement of Resources

In keeping with the mechanism for coordination of implementation of the NBSAP (2012-2020), the MNRE, through the EPA, will be expected to coordinate the mobilization of financial support by reaching out to the range of potential resource providers to present the NBSAP and Priority Actions and to ascertain levels of interest and financing availability to support the action. In instances where the Priority Actions may be implemented by other State or Non State Entities, the MNRE, through the EPA, would be expected to lend support in accessing financing.

Actions	Lead	Time Frame	Partners
Identify current biodiversity-related work and resources used/available.	MNRE/EPA	2014-2015	UG, CI, WWF, Iwokrama
Identify resource gaps and needs	MNRE/EPA	2014-2015	
Compile information on donor profiles, processes, funding opportunities	MNRE/EPA	2014-2015	MoF
Compile information on potential partners, and develop approaches for building partnerships, e.g. with communities, NGOs, academia, international NGOs.	MNRE/EPA	2014-2020	UG, C.I, WWF, Iwokrama, Smithsonian, IUCN, UNDP, MoAA
Advocate for increased allocations from the national budget to support the BM Division of the EPA.	MNRE/EPA	2014-2020	MoF
Securing financing for biodiversity-related initiatives and projects through the Guyana REDD+ Investment Fund (GRIF), which is a multi-contributor trust fund for the financing of activities identified under the LCDS.	MNRE/EPA	2014-2015	MoF
Maximizing access to funds allocated through the Global Environment Facility (GEF) and United Nations organizations, funds and programmes.	MNRE/EPA	2014-2020	MoF
Build on and expand opportunities for ODA, e.g. the KfW financed National Protected Areas Systems Project.	MNRE/EPA	2014-2015	MoF
Expand programme of support for biodiversity activities from NGOs, foundations and academic institutions. Conservation International, World Wildlife Fund, Smithsonian Institute, Iwokrama and others have supported and also executed projects which have contributed to meeting biodiversity conservation objectives.	MNRE/EPA	2014-2020	UG, C.I, WWF, Iwokrama, Smithsonian, IUCN, UNDP
Expand community-based biodiversity and livelihood projects and activities through developing partnerships and joint programming with GEF Small Grants Programme, GRIF supported development activities in Amerindian communities and other small-scale funding windows of other bilateral partners to support on-the-ground community actions.	MNRE/EPA	2014-2020	MoAA, UNDP, NTC, NRDDB, MoF
Establish and or enhance partnerships and linkages with regional organizations and programmes.	MNRE/EPA	2014-2020	MoFA, UNDP, CARICOM,

Actions	Lead	Time Frame	Partners
Undertake joint and synergistic programming across these 3 GEF focal areas (e.g. joint programme on biodiversity and climate change; joint programme on biodiversity and land degradation).	MNRE/EPA	2014-2015	UNDP, GEF
Enhanced cooperation and coordination of initiatives that would lend to achieving the NBSAP Strategic Objectives and Priority Actions. These could include initiatives being undertaken by other sector Agencies, e.g. the rehabilitation of mined out areas and re-vegetation.	MNRE/EPA	2014-2020	GFC, GGMC, GLSC, MoA, MoAA,
Explore market-based instruments (such as economic incentives, fiscal instruments, environmental certification schemes, labeling/branding and green public procurement) that have the potential to support the conservation and sustainable use of biodiversity, as well as improve the sustainability of supply chains.	MNRE/EPA	2014-2020	MoF, OCC
Promote the development and use of innovative financing mechanisms such as the Guiana Shield Facility, including market-based instruments. Payments for Ecosystem Services schemes could reward public and private goods from agricultural, forest and marine ecosystems.	MNRE/EPA	2014-2020	MoF, OCC

APPENDIX IV: COMMUNICATIONS STRATEGY

The Strategy

This Strategy is aimed at developing and supporting actions to address gaps and priority issues relevant to the development of the NBSAP. It seeks to identify targets, activities, and timeframes. It utilizes as its point of departure:

- the findings of the Stocktaking and Assessment Report of the current situation in Guyana;
- the status and trends regarding biodiversity and mechanisms employed to ensure proper management and protection of biodiversity;
- feedback from stakeholder groups, ministries, agencies and Commissions; and
- a formal stakeholder consultation organized by the EPA and facilitated by the Consultants.

Gaps identified in Stocktaking Report

The main gaps identified are:

- Limited or no awareness of the NBAP:
  - *Over 50% of the institutions surveyed were not familiar with the NBAP.*

- Insufficient coverage of biodiversity in major legislations with the exception of the Wildlife Regulations;
  - which defines biodiversity as:
    "*The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and ecological complexes of which they are part; this includes diversity within species, between species and of ecosystem*."

- Inadequate coordination and integration among institutions.

- Shortage of technical skills and qualified persons for analytical work.

- Need for national publication or information sharing related to biodiversity use.

- Need for management/studies to strengthen to capture local research and researchers in the process.

Gaps identified at Stakeholder Consultation held on July 15, 2014, and recommendations

In order to elicit feedback from stakeholders, the EPA organized a stakeholder consultation on the NBSAP. The consultation facilitated was conducted in plenary session as well as in group session. Each of five groups had a different remit as follows:

Group 1: Capacity Development & Technology Needs Assessment

Group 2: Resource Mobilization

Group 3: Communications Strategy

Group 4: National Coordinating Structure

Group 5: The Vision

The following reflects the remit of Group 3; to address the following questions:

- What are the priority issues to be communicated?

- Given the priority issues, what is our message?
- What resources are needed?
- What should be the target groups and why?
- What media should be used; for which groups, and why?
- What partners are necessary; what are potentially useful?
- Funding; where should it come from?

Question	Feedback
a. What are the priority issues to be communicated?	▪ Definition of Biodiversity that is simple, clear and yet accurate. ▪ Need to share and preserve Biodiversity. ▪ Its important contribution to livelihood and GAP of the country ▪ Relationship that exists between Biodiversity and humans that is needed for survival.
b. Given the priority issues what is our message?	Biodiversity is crucial to our health and well being and national development, as such everyone has the responsibility to be interested in it since it affects us in as much as we affect it.
c. What resources are needed?	Human**,** training in communication (indigenous languages), etc., finance, ITC, Internet access, accurate and updated data base, linkage with other Agencies / Ministries and NGO's of interest.
d. What should be the target groups and why?	**Target:** All staffers of the EPA. **Why:** So all can carry the same message. **Target:** Indigenous groups **Why:** To interact very closely with. **Target:** Ministry of Education **Why:** To make caring for our biodiversity part of the culture of everyone. **Target:** Ministry of Agriculture. **Why:** Every aspect of their responsibility is biodiversity-related. **Target:** Other Ministries and agencies. **Why:** Ministries are interdependent and collaborate in the execution and management of national policies. Almost every Ministry or Statutory Commission deals with some aspect of biodiversity. **Target:** Youth groups & NGOs. **Why:** Youth groups & NGOs form a large part of population. They have networks which could facilitate the dissemination and exchange of vital information and public awareness on biodiversity. **Target:** Religious bodies.

Question	Feedback
	Why: Are involved in outreaches and have gatherings that can be informed about BD. **Target:** Users & distributors of hazardous chemicals **Why:** Can have a significant impact of BD. **Target:** Women groups. **Why:** Many use resources that are part of Guyana's Biodiversity from BD. **Target:** Users & distributors of hazardous chemicals. **Why:** Users & distributors of hazardous chemicals. **Target:** Security forces. **Why:** Their activities and responsibilities cover the whole country. They are in a position, therefore, to observe and monitor use of, or threats to, Guyana's Biodiversity. Consequently also, the security forces are well-placed to share the messages on biodiversity.

e. What media should be used; for which groups, and why?

Group	Media	Why
All staffers of the EPA.	Training sessions, posters.	As coordinators of the NBAP and lead agency in the execution of the NBSAP, the staff of the EPA should be a priority target.
Indigenous groups.	Through community-based activities, internet, Toshaos meetings.	Indigenous people in Guyana are the original conservationists and stewards of the country's biodiversity. The best conduit for reaching these groups is the National Toshao's Council, the local Toshao, Councillors, and community who would advise on the best media and timings to communicate with their community.
Min of Education.	Videos, talks, part of science curriculum, posters & fliers	To take advantage of the multiplier effect of learning and teaching.
Min of Agriculture.	Training sessions, posters.	Posters can be placed in work places.
Other Ministries and agencies.	Training sessions, posters.	Posters can be placed in work places.
Youth groups & NGOs.	Training sessions, posters, social media, internet, phone.	Posters can be placed in work places and other places to inform more persons.
Religious bodies.	Posters & fliers, request time and hold talks.	They are also interested in the environment and do meet to discuss other matters of interest.
Users & distributors of hazardous chemicals.	Training sessions, posters, updated website.	Posters can be placed in work places.
Women's groups	Training sessions, posters.	Posters can be placed in work places.

Group	Media	Why
Security forces.	Training sessions, posters.	Posters can be placed in work places.

Question	Feedback
f. What partners are necessary; what are potential useful?	Government, international bodies, and all that are listed as target groups. First, the Government of Guyana should set aside monies to deal with such. Secondly, the Local government bodies and NDC's, followed by private sector and NGO's and lastly, international organizations.

Implementation

Given its lead role in implementing measures towards the fulfillment of Guyana's obligations under the UNCBD, the EPA is identified here as a primary stakeholder. It is critical and recommended that the EPA enhance and refine its capacity in communication, advocacy, inter-agency coordination, media liaison, production, presentation, and dissemination.

As the coordinator and official entity for the CEPA component of the NBSAP, the EPA will be expected to coordinate, validate, and disseminate education and public awareness material on programmes, activities and achievements of the MNRE and Commissions under its coordination. These are the Guyana Geology and Mines Commission (GGMC), the National Parks Commission (NPC), the Protected Areas Commission (PAC), the Guyana Lands and Surveys Commission (GLSC), and the Guyana Forestry Commission (GFC).

The EPA will also coordinate the CEPA activities of government ministries, e.g. Ministries of Finance, Education, Agriculture and Local Government, Amerindian Affairs, Tourism, Industry and Commerce, and Housing.

Points of Action: Responsibility

In its lead role, the EPA would be expected to:

- Advocate for a clear and sustained Government position on biodiversity issues, NBAP, and the CBD obligations.
- Carry out a baseline survey to determine the degree of knowledge on biodiversity among government ministries and statutory bodies.
- Carry out a baseline survey to determine the degree of public knowledge on biodiversity, as well and knowledge within the primary and secondary schools, technical and vocational schools, and tertiary educational institutions.
- Engage and partner with other Commissions under the policy management of the Ministry of Natural Resources and Environment (MNRE).
- Communicate awareness of biodiversity to a wide range of publics, as a critical element in national planning and development.
- Sustain CEPA initiatives to facilitate an understanding of these issues.
- Build upon current public awareness programmes and engagements, and those recently completed.
- Engage the national media in the development and dissemination of education and awareness programmes; in the process validating, demystifying technical information for general consumption.
- Review and refine the list of stakeholders, partner organizations and collaborators in CEPA activities.

- Projectize the CEPA component of the NBAP in order to attract financial and technical resources, and maximize awareness among stakeholders; thus enhancing their capacity to contribute to the conservation and management of the country's biodiversity.
- Partner with national and international non-governmental organizations (NGOs) in research, consultations, fund-raising and dissemination of information.
- Maintain a current database of stakeholders and strategic allies.
- Upgrade and update the EPA website as a critical component of its CEPA.

In order to carry out the CEPA responsibility adequately, the EPA is advised to establish a CEPA unit, and have its staff trained. That staff would have also, responsibility for managing and updating the content of the EPA website and intranet, media advocacy and liaison, CEPA training of personnel of government ministries, agencies and statutory commissions under the policy management of the MNRE.

Stakeholder Engagement

See verbatim at Annex 1, questions and responses from Stakeholder Consultations held on July 15, 2014.

Coordination of stakeholder engagement is the continuing responsibility of the EPA. This extends also to liaison and collaboration with potential strategic partners, e.g.

- The Private Sector including the agriculture, mining, forestry and fishing industries, and importers and distributors of agro-chemicals.
- Other private sector entities, e.g. oil companies involved in on-shore and off-shore exploration, vendors of agricultural and household chemicals, which have current and established programmes of public education and awareness via the media; e.g. proper use and storage of chemicals and biological pest control.
- Umbrella Organizations of Indigenous Peoples' NGOs.
- International intergovernmental organizations, e.g. the United Nations Development Programme, the UN Food and Agriculture Organization, the UN Children's Fund, the International Development Bank.
- International non-governmental agencies, *viz*. Conservation International-Guyana, World Wildlife Fund (WWF Guyana), the Iwokrama International Centre for Rainforest Conservation and Development, Tropenbos International.
- The Guyana Gold and Diamond Miners' Association (GGDMA), and independent miners who are not part of the GGDMA, and companies involved in gold and diamond exploration and extraction.

As a complement, please refer to Annex 6, Draft List of Stakeholders, drawn from the Inception report of the consultants, the EMC.

Media Liaison

At August 2014, there are 7 radio stations, 18 television stations, 5 daily newspapers, and a number of small industry publications in Guyana, all of which are potential sources of dissemination on issues of biodiversity, and monitors of Guyana's compliance with its obligations under the UNCBD.

Proposed/ Estimated Budget; 2014-2020

Activity	2014 000 $	2015 000 $	2016 $000 $	2017 000 $	2018 000 $	2019 000 $	2020 000 $	TOTAL 000 $
Advocacy with Government and private sector	250	250	250	250	250	250	250	1750
Baseline surveys	500	500	-----	-----	-----	-----	-----	1000
Inter-Commission liaison under the MNRE	200	200	200	200	200	200	200	1400
Media production and dissemination costs (print media)	500	500	500	500	500	500	500	3500
Media production and dissemination costs (electronic media and new media)	1000	1000	1000	1000	1000	1000	1000	7000
Establishment and training of CEPA Unit with two communications/media staff; 1 Website management; 1 media and inter-agency liaison	2000	2000	500	500	500	500	500	6500
Communication/connection costs (bandwidth)	100	100	100	100	100	100	100	700
Equipment and accommodation	250	250	-----	-----	-----	-----	-----	500
Seminars and workshops	300	300	300	400	400	400	400	2500
Consultants	500	500	-----	500	-----	500	-----	2000
Travel and accommodation	250	300	300	300	300	300	300	2050
							Total	**27700**

Annex 1: Verbatim feedback from Stakeholder Consultation

Consultation on Guyana's Third National Biodiversity Strategy & Action plan

Group 3: <u>Communications Strategy</u>

Question **A)** What are the priority issues to be communicated?
Response –

- Definition of Biodiversity that is simple, clear and yet accurate.
- Need to share and preserve Biodiversity.
- Its important contribution to livelihood and GAP of the country.
- Relationship that exist between Biodiversity and humans that is needed for survival.

Question **B)** Given the priority issues, what is our message?
Response – Biodiversity is crucial to our health and well being and national development, as such **everyone** has the responsibility to be interested in it since it affects us in as much as we affect it.

Question **C)** What resources are needed?
Response – Human**,** training in communication (indigenous languages), etc., finance, ITC, Internet access, accurate and updated data base, linkage with other Agencies / Ministries and NGO's of interest.

Question **D)** What should be the target groups and why?
Response –

Group	**Why**
All staffers of the EPA	So all can carry the same message.
Indigenous groups	To interact very closely with.
Min of Education	This is to make caring for our BD part of the culture of everyone.
Min of Agriculture	They are very dependent on BD.
Other Ministries and agencies	They move around and relate with many persons that have an impact of BD such as forestry.
Youth groups & NGO's	They form a large part of population, they move around doing works and may provide info and help share the message. May have money.
Religious bodies	Are involved in outreaches and have gatherings that can be informed about BD.
Users & distributors of hazardous chemicals	Can have a significant impact of BD.
Women groups	Many are engaged in making use of resources that comes from BD.
Security forces	They move around the country and can be on the lookout and share the message.

Question **E)** What media should be used; for which groups, and why?
Response –

Group	**Media**	**Why**
All staffers of the EPA	Training sessions, posters	Since they may be in the same building and there is control over their time.
Indigenous groups	Through community based activates, internet, toshaos meetings	Internet is being more common in the far to reach villages. Toshaos come to town for meetings, etc.
Min of Education	Videos, talks, part of science	Posters can be placed in work

Group	Media	Why
	curriculum, posters & fliers	places.
Min of Agriculture	Training sessions, posters	Posters can be placed in work places.
Other Ministries and agencies	Training sessions, posters	Posters can be placed in work places.
Youth groups & NGO's	Training sessions, posters, social media, internet, phone	Posters can be placed in work places and other places to inform more persons.
Religious bodies	Posters & fliers, request time and hold talks	They are also interested in the environment and do meet to discuss other matters of interest.
Users & distributors of hazardous chemicals	Training sessions, posters, updated website	Posters can be placed in work places.
Women groups	Training sessions, posters	Posters can be placed in work places.
Security forces	Training sessions, posters	Posters can be placed in work places.

Question **F):** What partners are necessary; what are potential useful?
Response – Government, international bodies, and all that are listed as target groups.

Question **G):** Funding: where should it come from?
Response: First, the Government of Guyana should set aside monies to deal with such. Secondly, the Local government bodies and NDC's, followed by private sector and NGO's and lastly, international organizations.

Annex 2. List of Television Stations in Guyana

Georgetown

TVG 28

Advertising Supervisor:	Robin St. Marthe
Contact #:	226-9921/225-5753
Fax #:	2270685

WRHM 7

Advertising Manager:	Gina
Contact #:	226-1591
Fax #:	226-1591
Email:	sunjet.travel@networksgy.con

Capitol News

Editor-in-Chief:	Enrico Woolford
Contact #:	227-8289
Fax #:	227-8296
Email:	capitolnews@solutions2000.net

HGPTV CH.67

Advertising Manager:	Nyal
Contact #:	625-9298

NCN 11

Advertising Manager:	Mr. Raymond Azeez
Contact #:	227-1566 (Nirmala/Elseena)
Fax #:	226-0118

CNS 6

Advertising Manager:	Ms. Savitrie Singh
Contact #:	226-5462 (Tyrone)
Fax #:	227-3050
Email:	sharmacnstv.gy.com

HBTV 9

Advertising Manager:	Barbara Walrond
Contact #:	226-9986 (Tysa)
Fax #:	226-9986

Prime News

Editor-in-Chief:	Adam Harris
Contact #:	223-7225
Fax #:	227-2007
Email:	prime_news@hotmail.com

MTV 65

Advertising Manager:	Devi
Contact #:	225-8950
Fax #:	225-8944
Email:	newsupdate65@hotmail.com

NTN 69

Advertising Manager:	Anand Persaud/ Braam Persaud
Contact #:	223-5050 / 226-1279 / 223-5064

Fax #: 226-8446
Email: ntn@solutions2000.net

GWTV 2
Advertising Manager: Lorri Ann
Contact #: 218-1032

STVS 72
Advertising Manager: Kerwin Bollers
Contact #: 227-0580

Linden

NCN
Advertising Manager: Andrew McBean
Contact #: 444-6827
Fax #: 444-6517

Bartica

Tarzie (Bartica)
Advertising Manager: M.Y. Ghanie
Contact #: 455-2306
Fax #: 455-2306

Berbice

NCN
Advertising Manager: Jaffarali/Mainon
Contact #: 333-6151
Fax #: 333-6151

LRTV 10
Advertising Manager: Pearl Dindyal
Contact #: 333-4445
Fax #: 333-4446

Dave's 8
Advertising Manager: Mr. Rambarran
Contact #: 333-6339
Fax #: 333-2816

Essequibo

RCA 8
Advertising Manager: Alfro Alphonso
Contact #: 771-4181 / 223-5273
Fax #: 223-5266

Annex 3. List of Radio Stations in Guyana

Voice of Guyana-
Advertising Manager: Mr. Raymond Azeez
Contact #: 227-1566 (Nirmala/Elseena)
Fax #: 226-0118

98.1 HOT FM-
Advertising Manager: Mr. Raymond Azeez
Contact #: 227-1566 (Nirmala/Elseena)
Fax #: 226-0118

WCIG 93.1 Real FM
Contact: Shannis/Elseena
Contact #: 218-5092/93
645-4131/698-7777
Email: wcig93.1realfm@gmail.com

I Radio 90.1 Love FM
Marketing Manager: Torquessa Roberts
Contact #: 227-2826/227-2847
Email: marketing@iradiogy.com

HJ 94.1FM
Contact: Mr. Kerwin Bollers
Contact #: 227-0580

Radio Guyana Inc.
Advertising Supervisor: Angus Edgily/Lana
Contact: 226-9921/225-5753
Fax #: 2270685

Radio Paiwomak (Rupununi)
Contact: Mr. Michael Williams
Contact #: 772-9292
Email: radiopaiwomak@yahoo.com

Annex 4. List of Current Affairs Print Media in Guyana

Guyana Chronicle/Sunday Chronicle

Advertising Manager:	Hazel Hall
Contact #:	225-4474 / 226-3243-5 (Calvin)
Fax #:	225-0663
Website:	www.guyanachronicle.com

Stabroek News/ Sunday Stabroek

Advertising Manager:	Patricia Cumbermack
Contact #:	227-8569 / 226-5197 (Pat / Ron)
Fax #:	226-2549
Website:	www.stabroeknews.com

Mirror

Advertising Supervisor:	Devi Dookhie
Contact #:	226-2473
Fax #:	226-2472

Kaieteur News

Advertising Manager:	Sarah Balgobin
Contact #:	226-8210 / 225-8465
Fax #:	226-8210
Website:	www.kaieteurnewsgy.com

Guyana Times

Sales & Marketing Supervisor:	Angus Edghill/Lana
Contact #:	225-5128/231-0552/225-5753
Fax #:	227-0685
Website:	www.guyanatimesgy.com

Annex 5. Implementation Schedule

Activity	2014	2015	2016	2017	2018	2019	2020
Advocate for a clear and sustained Government position on biodiversity issues, NBAP, and the CBD obligations.							
Carry out a baseline survey to determine the degree of knowledge on biodiversity among government ministries and statutory bodies.							
Baseline surveys to determine the degree of public knowledge on biodiversity, as well and knowledge within the primary and secondary schools, technical and vocational schools, and tertiary educational institutions.							
Engage and partner with other Commissions under the policy management of the Ministry of Natural Resources and Environment (MNRE).							
Communicate awareness of biodiversity to a wide range of publics, as a critical element of national planning and development.							
Build upon current public awareness programmes and engagements, and those recently completed.							
Engage the national media in the development and dissemination of education and awareness programmes.							
Review and refine the list of stakeholders, partner organizations and collaborators in CEPA activities.							
Projectize the CEPA component of the NBAP in order to attract financial and technical resources, and							
Partner with national and international non-governmental organizations (NGOs) in research, consultations, fund-raising and dissemination of information.							
Maintain a current database of stakeholders and strategic allies.							
Upgrade and update the EPA website as a critical component of its CEPA.							
Establish a CEPA unit within the EPA.							

Annex 6. List of Stakeholders

(Source: Inception Report)

Stakeholder	Role	Stake		Category
Private Sector	**Decision maker, legislator, implementer, regulator, resource users** Research, finance, legal etc	**Influence**	**Interest**	
▪ Private Sector Commission (PSC)	Resource users, research, finance	Low	High	
▪ Guyana Association of Bankers	Finance	High	High	
▪ Guyana Manufacturing & Services Association (GMSA)	Resource users, research, finance	Low	High	
▪ Forest Products Association of Guyana (FPA)	Resource users, research	Low	High	
▪ Forestry Training Centre Inc. (FTCI)	Implementer	High	High	
▪ Guyana Sugar Corporation Inc. (GUYSUCO)	Resource users, research, finance	High	High	
▪ Guyana Rice Producers Association (GRPA)	Resource users, research	Low	High	
▪ Guyana Gold & Diamond Miners Association (GGDMA)	Resource users, finance	High	High	
▪ Guyana Women Miners Association	Resource users, finance	Low	High	
▪ Guyana Association of Professional Engineers (GAPE)	Research	Low	High	
▪ Guyana Bar Association	Legal	High	High	
▪ Guyana Association of Women Lawyers	Legal	High	High	
▪ Tourism and Hospitality Association of Guyana (THAG)	Resource users, finance	High	High	
▪ Chambers of Commerce	Resource users	High	High	
▪ Guyana Goldfields Inc.	Resource users, finance, research	High	High	
▪ ETK Inc.	Resource users, finance, research	High	High	
▪ Reunion Manganese Inc.	Resource users, finance, research	High	High	
▪ Stronghold Guyana Inc.	Resource users, finance, research	High	High	
▪ Sacre-Coeur Minerals Ltd.	Resource users, finance, research	High	High	
▪ Bauxite Company of Guyana Inc. (BCGI)	Resource users, finance, research	High	High	
▪ Bosai Minerals Group (Guyana) Inc.	Resource users, finance, research	High	High	
▪ Guyana Industrial Minerals Inc. (GINMIN)	Resource users, finance, research	High	High	
▪ CGX Resources Inc.	Resource users, finance, research	High	High	
▪ Repsol YPF	Resource users, finance, research	High	High	

Influence
Measure the ability to help or have impact.

Interest
Measures the degree of support.

Stakeholders with high influence and high interest are critical for key milestones and decisions.

Stakeholders with high interest and low influence or high influence and low interest should be kept informed and satisfied/ can seek views on key issues and concerns addressed.

Stakeholder	Role	Stake		Category
▪ Anadarko Guyana Company	Resource users, finance, research	High	High	
▪ Exxon Mobil	Resource users, finance, research	High	High	
▪ S.A. Nabi and Sons Ltd.	Resource users, finance, research	High	High	
▪ Amazon Caribbean (Guyana) Ltd. (AMCAR)	Resource user	High	High	
Public Sector				
▪ Ministry of Natural Resources & The Environment - Guyana Forestry Commission (GFC) - Guyana Geology & Mines Commission (GGMC) - Guyana Gold Board - Guyana Lands & Surveys Commission (GLSC) - Environmental Protection Agency (EPA) - Guyana Wildlife Management Authority - Protected Areas Commission (PAC)	Decision makers	High	High	
▪ Min of Amerindian Affairs - Amerindian Village Councils - Community Development Councils	Decision makers	High	High	
▪ Ministry of Health	Decision makers, research	High	High	
▪ Ministry of Education - National Centre for Educational Resource Development (NCERD) - Cyril Potter College of Education (CPCE)	Decision makers, implementer	Low	High	
▪ Ministry of Agriculture - National Agriculture Research & Extension Institute (NAREI) - Fisheries Department - Guyana Livestock Development Authority (GLDA) - Hydrometeorological Division - Guyana Rice Development Board (GRDB)	Decision makers	High	High	
▪ Ministry of Foreign Affairs	Decision makers, implementer	Low	High	
▪ Ministry of Local Government & Regional Development - Regional Democratic Councils	Decision makers, implementer	Low	High	
▪ Ministry of Tourism, Commerce and	Decision makers, regulator, finance	High	High	

Influence
Measure the ability to help or have impact.

Interest
Measures the degree of support.

Stakeholders with high influence and high interest are critical for key milestones and decisions.

Stakeholders with high interest and low influence or high influence and low interest should be kept informed and satisfied/ can seek views on key issues and concerns addressed.

Stakeholder	Role	Stake		Category
Industry				
- Guyana Tourism Authority (GTA)				
- Guyana Office for Investment (GO-Invest)				
▪ Ministry of Home Affairs				
- Guyana Police Force	Legal, regulators	Low	High	
▪ Guyana Defence Force				
- Coast Guard	Regulators	Low	High	
▪ Ministry of Labour, Human Services & Social Security	Decision makers, implementer, regulator	Low	High	
- Women's Affairs Bureau				
▪ Guyana Water Inc.				
▪ Presidential Advisors on Environment & Natural Resources	Resource users Decision makers	High High	High High	
▪ Statutory Boards - GFC, GGMC, EPA, GLSC, PAC	Decision makers	High	High	
▪ Indigenous Commission				
▪ Women and Gender Equality Commission	Implementer	Low	High	
▪ Parliamentary Sub-committee on Natural Resources	Implementer Decision makers	Low High	High High	
▪ Attorney General Chambers				
▪ National Toshaos Council	Legal	High	High	
▪ North Rupununi District Development Board (NRDDB)	Resource users Implementer, resource users	Low High	High High	
▪ Guyana Information Agency (GINA)				
▪ Project Management Office - Guyana REDD+ Investment Fund (GRIF)	Implementer Finance	Low High	High High	
▪ United Nations Development Programme (UNDP)	Implementer	High	High	
▪ United Nations Environment Programme (UNEP)	Implementer	High	High	
▪ United Nations Children's Fund (UNICEF)				
▪ Pan American Health Organization (PAHO)	Implementer Implementer	High Low	High High	
▪ Global Environment Facility Small Grants Programme - GEF SGP	Implementer, finance	High	High	
Civil Society				
▪ Media Associations	Implementer	Low	High	
▪ Inter-Religious Organization (IRO)	Implementer	Low	Low	

Influence
Measure the ability to help or have impact.

Interest
Measures the degree of support.

Stakeholders with high influence and high interest are critical for key milestones and decisions.

Stakeholders with high interest and low influence or high influence and low interest should be kept informed and satisfied/ can seek views on key issues and concerns addressed.

Stakeholder	Role	Stake		Category
▪ University of Guyana	Implementer, research	High	High	
▪ Guyana School of Agriculture (GSA)	Implementer, research	High	High	
▪ Bina Hill Institute for Research, Training & Development	Implementer, research	High	High	
▪ North West Organics	Resource users	Low	High	
▪ Guyana Teachers Union (GTU)	Implementer	Low	Low	
▪ Federation of Independent Trade Unions of Guyana (FITUG)	Implementer	Low	Low	
▪ Indigenous NGOs	Implementer, research	High	High	
▪ Guyana Marine Turtle Conservation Society (GMTCS)	Resource user, research, implementer	Low	High	
▪ Guyana Amazon Tropical Birds Society (GATBS)	Resource user, research, implementer	Low	High	
▪ Environmental Community Health Organization (ECHO)	Implementer	Low	High	
▪ World Wildlife Fund (WWF)	Research, implementer, finance	High	High	
▪ Conservation international Guyana	Research, implementer, finance	High	High	
▪ Iwokrama International Centre for Rainforest Conservation and Development (IIC)	Resource user, implementer	High	High	

Annex 7: UNCBD Goals and Aichi Targets

CBD GOALS	***Aichi Targets***
Strategic Goal A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.	***Target 1*****:** By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably. ***Target 2*****:** By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems. ***Target 3*****:** By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions. ***Target 4*****:** By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.
Strategic Goal B. Reduce the direct pressures on biodiversity and promote sustainable use.	***Target 5*****:** By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced. ***Target 6*****:** By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits. ***Target 7*****:** By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity ***Target 8*****:** By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity. ***Target 9*****:** By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment. ***Target 10*****:** By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.
Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.	***Target 11*****:** By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes. ***Target 12*****:** By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services.	***Target 13*****:** By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity. ***Target 14*****:** By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous

CBD GOALS	***Aichi Targets***
	and local communities, and the poor and vulnerable. ***Target 15*****:** By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification. ***Target 16*****:** By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.
Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building.	***Target 17*****:** By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan. ***Target 18*****:** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels. ***Target 19*****:** By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied. ***Target 20*****:** By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.