



GUYANA'S Fifth National Report to the Convention on Biological Diversity



GUYANA'S FIFTH NATIONAL REPORT TO THE CONVENTION ON BIOLOGICAL DIVERSITY

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ACRONYMS

ABS	Access and Benefit Sharing
COCA	Community-Owned Conservation Area
CBO	Community-Based Organisation
CDM	Clean Development Mechanism
CI	Conservation International
CMRV	Community Monitoring Reporting and Verification
CSOs	Civil Society Organisations
EIS	Extractive Industrial Sector
EPA	Environmental Protection Agency
EVN	Economic Value to the Nation
EVW	Economic Value to the World
FAO	Food and Agriculture Organization
FTCI	Forestry Training Centre Inc.
GDP	Gross Domestic Product
GEF	Global Environment Facility
GMO	Genetically Modified Organisms
GFC	Guyana Forestry Commission
GGMC	Guyana Geology and Mines Commission
GMRP	Guyana Mangrove Restoration Project
GLSC	Guyana Lands & Surveys Commission
GoG	Government of Guyana
GRIF	Guyana REDD+ Investment Fund
ICZMP	Integrated Coastal Zone Management Plan
IDB	Inter-America Development Bank
IPCC	Intergovernmental Panel on Climate Change
ITTO	International Tropical Timber Organization
IUCN	International Union for Conservation of Nature
Iwokrama	The Iwokrama International Centre for Rainforest Conservation and Development
KfW	Kreditanstalt für Wiederaufbau
LCDS	Low Carbon Development Strategy
LME	Large Marine Ecosystem
LMO	Living Modified Organisms
MOU	Memorandum of Understanding
MNRE	Ministry of Natural Resources and the Environment
MRVS	Monitoring Reporting and Verification System
MSSC	Multi-Stakeholder Steering Committee
NBAP	National Biodiversity Action Plan
NDS	National Development Strategy
NEAP	National Environmental Action Plan
NFAP	National Forestry Action Plan
NFP	National Forest Policy
NGO	Non-Governmental Organization
NLUP	National Land Use Plan
NMMP	National Mangrove Management Action Plan
NPAS	National Protected Areas System
OCC	Office of Climate Change
PAC	Protected Areas Commission
PGRFA	Plant Genetic Resources for Food and Agriculture
POPs	Persistent Organic Pollutants
SEES	School of Earth and Environmental Sciences
SGP	Small Grants Programme
SNC	Second National Communication
TEEB	The Economics of Ecosystems and Biodiversity
UNCBD	United Nations Convention on Biological Diversity
UNEP	United Nations Environment Programme

EXECUTIVE SUMMARY

Background

Guyana signed the United Nations Convention on Biological Diversity (UNCBD) in June 1992 and subsequently ratified the Convention in August 1994. Since then, four national reports to the UNCBD have been prepared and submitted for the periods 1994-1999, 2000-2003, 2004-2006, and 2007-2010. In keeping with its commitments under the Convention, specifically Article 26 of the UNCBD and Decision X/10 of the Conference of Parties (COP), Guyana is required to prepare a Fifth National Report (5NR) for the period 2011-2014.

This 5NR to the UNCBD covers the period 2011 to 2014 and describes actions taken by Guyana to conserve and sustainably manage its diversity and how these actions are contributing to the achievement of the UNCBD strategic goals and the Aichi Biodiversity Targets of the updated Strategic Plan for Biodiversity 2011-2020. The latest developments, i.e. developments which have occurred since the last national report (Fourth National Report) are provided as requested by the UNCBD.

The 5NR preparation followed the UNCBD guidelines for the preparation of 5NRs and was in accordance with Article 26 of the Convention and decision X/10 of the COP. The guidelines proposed that the report be composed of three main parts and provided key questions which the Guyana 5NR attempted to address as much as possible based on available information. The UNCBD guidance is as follows:

Part I – An update on biodiversity status, trends and threats and implications for human well-being.

- Q1. Why is biodiversity important for your country?
- Q2. What major changes have taken place in the status and trends of biodiversity in your country?
- Q3. What are the main threats to biodiversity?
- Q4. What are the impacts of the changes in biodiversity for ecosystem services and the socio-economic and cultural implications of these impacts?

Part II – The national biodiversity strategy and action plan (NBSAP), its implementation and mainstreaming of biodiversity.

- Q5. What are the biodiversity targets set by your country?
- Q6. How has your national biodiversity strategy and action plan been updated to incorporate these targets and to serve as an effective instrument to mainstream biodiversity?
- Q7. What actions has your country taken to implement the Convention since the fourth report and what have been the outcomes of these actions?
- Q8. How effectively has biodiversity been mainstreamed into relevant sectoral and cross-sectoral strategies, plans and programmes?
- Q9. How fully has your national biodiversity strategy and action plan been implemented?

Part III – Progress towards the 2015 and 2020 Aichi biodiversity Targets and contribution to the relevant 2015 Targets of the Millennium Development Goals (MDGs).

- Q10. What progress has been made by your country towards the implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets?
- Q11. What has been the contribution of actions to implement the Convention towards the achievement of the relevant 2015 targets of the MDGs in your country?
- Q12. What lessons have been learnt from the Implementation of the Convention in your country?

This Executive Summary provides a synopsis of the main points of the 5NR.

Introduction

Guyana is situated on the northern coast of South America and is approximately 215,000 km² 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 2013¹. 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 GDP¹.

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 km² is the single largest remaining tropical rainforest in the world and is home to at least 10% of the world's known biodiversity².

Guyana is home to a vast expanse of primary tropical forest, freshwater and other unique ecosystems. Guyana is usually considered to consist of four (4) main natural regions³ - Coastal Plain, Hilly Sand and Clay Region, Interior Savannas and Forested Highlands, although the FAO mapped five (5) separate Physiographic Regions:

- 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) savannah, (iii) freshwater, (iv) wetland, (v) coastal, and (vi) marine. These ecosystems support diverse species to the extent that as of 2010 Guyana's species status was estimated as 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 virus.

According to FAO⁴, 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 International Union for the Conservation of Nature (IUCN) for Guyana is the Giant Otter (*Pteronura brasiliensis*). The only Endangered bird species listed in Guyana are: Sun parakeet (*Aratinga solstitialis*); Hoary-throated spintail (*Synallaxis kollari*); and, the Red siskin (*Carduelis cucullata*). Guyana has no listed Critically Endangered or Endangered freshwater vertebrates.

The IUCN Red List Endangered marine species known to occur in Guyana include: the Green Sea Turtle (*Chelonia mydas*), the Nassau Grouper (*Epinephelus striatus*), the Scalloped Hammerhead (*Sphyrna lewini*), the Squat-headed Hammerhead Shark (*Sphyrna mokarran*), the Atlantic Bluefin Tuna (*Thunnus thynnus*), the Sei Whale (*Balaenoptera borealis*), the Blue Whale (*Balaenoptera musculus*), and the Fin Whale (*Balaenoptera physalus*). The Critically Endangered marine species include: the Daggernose Shark (*Isogomphodon oxyrinchus*); the Caribbean Electric Ray (*Narcine bancroftii*); the Largetooth Sawfish (*Pristis pristis*), and the Hawksbill Sea Turtle (*Eretmochelys imbricata*). 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 fishes are threatened⁵.

¹ National Budget, 2014.

² WWF-Guianas Wetlands of Guyana study, 2012.

³ Text on Guyana's main natural regions taken from Guyana's National Land Use Plan, 2013.

⁴ FAO, Global Forest Resources Assessment 2005. <http://www.fao.org/forestry/country/20807/en/guy/>.

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

The local conservation status of the IUCN Red List of threatened species reported is not known. Guyana has no adopted or proposed list of threatened or endangered species. Despite their IUCN listing internationally, evidence supported by several studies suggests that the IUCN Red List threatened species that occur in Guyana are found in healthy populations throughout their ranges in Guyana. Pickles *et al* (2009)⁶ conducted a biodiversity assessment of the head of the Rewa River in southern Guyana. Their survey documented a high density of the threatened species (50% of Guyana's threatened species were observed) within the Rewa Head. Lim *et al* (1999)⁷ biodiversity study conducted in the Iwokrama forest of central Guyana showed that the Iwokrama forest supports healthy populations of Guyana's threatened species'.

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, habitats and ecosystems 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 as well as coastal 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, (iii) expansion of extractive industries, and (iv) new settlements.

National Biodiversity Strategy and Action Plan and Mainstreaming of Biodiversity

Guyana's first prepared a National Biodiversity Action Plan (NBAP) for the period 1999 to 2004. The NBAP aimed "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 Environmental Protection Agency (EPA), in 2004, conducted a review of the NBAP and prepared a second NBAP (NBAP II) for the period 2007 to 2011 that focused on addressing four thematic areas - forests, agriculture, coastal resources, and marine and freshwater resources. Subsequently, the EPA commenced a process to revise and update the NBAP II towards the preparation of a National Biodiversity Strategy and Action Plan (NBSAP). This NBSAP is expected to include a strategy for implementation, as well as agreed national targets. It further expects to set out the vision, the roles, duties and obligations of the country and its citizens and the actions to protect, conserve, use sustainably and share equitably the benefits arising from biodiversity. The NBSAP also examines synergies with national initiatives and, in particular, incorporates the objectives of Guyana's Low Carbon Development Strategy (LCDS) and the Aichi 2011- 2020 Targets.

From the assessment conducted for the preparation of the 5NR, it was found that biodiversity is being mainstreamed at various levels and by different stakeholders in Guyana. A few examples of these 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 Government of Guyana (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.

⁶ Pickles, R., McCann, N. and A. Holland, 2009. A Biodiversity Assessment of the Rewa Head, Guyana. ZSL Conservation Report No. 10. The Zoological Society of London, London.

⁷ Lim, B., Engstrom, K., Mark D. and F. A. Reid, 1999. Guide to the Mammals of the Iwokrama Forest. Iwokrama International Centre for Rainforest Conservation.

The Strategy seeks to not only expand subsistence agriculture but also to push entrepreneurial enterprise and to diversify agriculture by embracing non-traditional crops and also 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. Government has developed a Sea and River Defence Policy⁸, 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.

Implementation of NBAP and Key Achievements and Challenges

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 since the Fourth National Report:

- National policies were developed including the National Forest Policy, 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 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 (2013), Species Protection Regulations (1999), Protected Areas Act (2011), the Forest Act (2009), and the Hydro-Electric Power Amendment Act (2013) which allows for the creation of biodiversity offsets. The Wildlife Management and Conservation Regulations were gazetted in 2013 and the Wildlife Import and Export, Biosafety and ABS legislation 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 management⁹. All the natural resources related Agencies and Commissions are now under the purview of the Ministry. A Costed Strategic Framework 2013 -2018 for the MNRE was also prepared.
- 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 NPAS, management plans for individual protected areas, and establishing field presence in protected areas.

⁸ National Mangrove Management Action Plan, 2010-2012.

http://www.gcca.eu/sites/default/files/catherine.paul/national_mangrove_management_action_plan_2010-2012.pdf.

⁹ 2012 Annual Report, MNRE.

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

Challenges

Some of the main challenges to enhancing biodiversity conservation and protection have been identified 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 qualified resources staff in key natural resources institutions;
- limited or no awareness of the NBAP by key stakeholders in the sector. Where some awareness regarding the NBAP exists, stakeholders indicated that the document is in a format that is not user friendly; and
- limited baseline data to establish adequate trends on biodiversity.

Progress to-date to implement the UNCBD Strategic Plan 2011-2020

Guyana has made considerable progress to achieve the Aichi Targets and the targets as outlined in the UNCBD Strategic Plan 2011-2020. These actions reflect the country's new development thrust based on a low carbon trajectory and priority given to protecting and sustainably managing forest ecosystems. In keeping with this principle of green growth, much effort is being placed to protecting and promoting Guyana's natural assets with significant efforts being made towards establishing urban and rural protected areas and the development of ecotourism. The following is a snapshot of some of the key initiatives which have contributed to achieving the Aichi Targets and UNCBD Strategic Plan 2011-2012.

Emphasis is placed on agriculture for food security as well as the importance placed on increasing protection for biodiversity and new growth areas such as eco-tourism for economic development. Specific details can be obtained from the full report, however, the key progress in these areas are summarized below:

- The Protected Areas Act was enacted in 2011 and subsequently the PAC was established. This legislation also established a National Protected Areas System (NPAS).
- Two new protected areas were established. These are the Kanuku Mountains and Shell Beach.
- A NPAS Plan was prepared and provides a roadmap for the development of the NPAS.
- The draft management plan for the Kaieteur National Park was revised, and a management plan for the Shell Beach Protected Area is currently being developed.
- A revised draft of the management plan for the Kanuku Mountains Protected Area was completed.
- The Protected Areas Act mandates the establishment of a National Protected Areas Trust Fund to provide long-term financing for the NPAS. Regulations for the operation of the Fund as required under the Act were prepared and approved by the Cabinet and the Board of Trustees appointed for the Trust Fund which has been endowed with US \$18.5 million from contributions by the GoG, Kreditanstalt für Wiederaufbau (KfW), and Conservation International (CI).
- A *Three Parks Initiative*, which aims to revitalize the National Park, Zoological Park, and the Botanical Gardens, was launched.
- A Mangrove Visitor Centre was constructed that now hosts approximately 3 000 students per year and 200 visitors per month.
- A mangrove inventory of the entire coastline was completed. Monitoring of the mangrove forests was enhanced with the establishment of a ranger unit comprising 8 rangers monitoring approximately 36.5 km of mangroves.

Contribution of Implementation Actions towards achievement of MDGs

The UNCBD has recognized that achievement of the MDGs is dependent on the effective conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resource resources. In 2001, Guyana set an ambitious agenda in its Poverty Reduction Strategy Paper (PRSP) aimed at generating economic growth, improving

its provision of social services, enhancing governance structures and progressing in a timely manner towards the achievement of the MDGs by 2015¹⁰. Reports, which charted the country's progress towards attainment of the eight MDGs, were completed in 2003, 2007 and 2011. For *MDG 7 – Ensuring Environmental Sustainability* and under which aspects of biodiversity actions are included, Guyana has made significant progress and is well positioned towards meeting this Goal by 2015.

Suggested Actions at National, Regional and Global Levels

Based on the information and stakeholder perspectives obtained during the preparation of this 5NR, the following are suggested actions at the global and national level:

- Provide assistance to countries to develop better databases, analyzing and generating better quality information for decision-making and for tracking and measuring results. (global).
- Institute a robust monitoring system, without which it will be impossible to demonstrate success of any programmes, action plans, strategies or policies or attribution of this success (local). An opportunity exists to expand the scope of the current MRVS to cover more biodiversity parameters.(national).
- Identify 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 preparing national reports (national).

¹⁰ Poverty Reduction Strategy Paper, 2011-2015.

1. INTRODUCTION

1.1 Description of Guyana

Guyana, the only English speaking South American country, is approximately 215,000 km² in size and is bordered by Venezuela on the west and northwest, Suriname on the east, Brazil on the south and southwest, and the Atlantic Ocean on the north.

Guyana has a relatively stable population of approximately 747,883 persons¹¹ and is culturally diverse with several Amerindian cultures as well as cultural influxes from Europe, Africa, India and China.

Guyana remains primarily an agricultural and natural resource based economy. Over the last two years, Guyana's economy has continued to grow at an average 5 percent annually. Per capita Gross Domestic Product (GDP) has risen from US \$1,694 in 2006 to US \$3,496.3 in 2013¹². 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 GDP².

In recent years, the Extractive Industry Sector (EIS)/mineral sector has experienced rapid growth both in terms of production and value, especially in the gold industry. In 2013, the mining and quarrying industry recorded 8 percent growth over 2012 with the gold industry achieving total declarations of 481 087 ounces, 9.7% above the previous year, and a historic performance¹³.

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 who are highly dependent on the range of goods and services made available from the ecosystem.

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.

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 economy¹⁴. 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

¹¹ Guyana Population and Housing Census, 2012. Preliminary Report, June 2014.

¹² National Budget, 2014. Budget Speech, Sessional Paper No. 1 of 2014, Tenth Parliament of Guyana, Under the Constitution of Guyana, First Session 2012-2014.

¹³ Guyana's Extractive Industry Sector: A Synopsis of Issues and Recommendations for the mining sector as a Sustainable Element of Guyana's Low Carbon Development Strategy (LCDS), June 2013. Contributors: CI-Guyana, WWF- Guianas, and Projekt-Consult GmbH.

¹⁴ A National Strategy for Agriculture in Guyana 2013-2020. Ministry of Agriculture.
<http://agriculture.gov.gy/National%20Agriculture%20Strategy%202013-2020.pdf>.

(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 6). In 2013, visitor arrivals totaled 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.

Guyana's NDS identifies tourism as a sector that can contribute to sustainable development 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 have been made to attract high-end ecotourists from North America and Europe in niche markets, initially to the Rupununi area of Guyana. Over the last four years, tourism grew annually at an average rate of 20% in the Rupununi.

1.2 Ratification and national reporting to the UNCBD

Guyana was among the 168 countries which signed the United Nations Convention on Biological Diversity (UNCBD) in June 1992 at the Rio Summit and subsequently ratified the Convention in August 1994. Guyana has since prepared and submitted four national reports to the UNCBD for the periods 1994-1999, 2000-2003, 2004-2006, and 2007-2010.

This Fifth National Report (5NR) to the UNCBD covers the period 2011 to 2014 and describes actions taken by Guyana in conserving and sustainably managing its biodiversity. The 5NR preparation followed the UNCBD guidelines for the preparation of 5NRs. The guidelines provide key questions which the Guyana 5NR attempted to address as much as possible based on available information. These questions are:

SECTION I

1. Why is biodiversity important for Guyana?
2. What major changes have taken place in the status and trends of biodiversity in Guyana?
3. What are the main threats to biodiversity?
4. What are the impacts of the changes in biodiversity for ecosystem services and the socio-economic and cultural implications of these impacts?

SECTION II

1. What are the biodiversity targets set by Guyana?
2. How has Guyana's national biodiversity strategy and action plan been updated to incorporate these targets and to serve as an effective instrument to mainstream biodiversity?
3. What actions has Guyana undertaken to implement the Convention since the fourth report and what have been the outcomes of these actions?
4. How effectively has biodiversity been mainstreamed into relevant sectoral and cross-sectoral strategies, plans and programmes?
5. How fully has Guyana's national biodiversity strategy and action plan been implemented?

SECTION III

1. What progress has been made by Guyana towards implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets?
2. What has been the contribution of actions to implement the Convention towards achievement of the relevant 2015 targets of the Millennium Development Goals in Guyana?

3. What lessons have been learned from the implementation of the Convention in Guyana?
4. In addition to addressing the key requirements of UNCBD as part of the 5NR reporting, the report also highlights key initiatives undertaken by Guyana during the reporting period and which have contributed in a significant way to the protection and maintenance of Guyana's biodiversity.

1.3 Brief description of Guyana's biological diversity

1.3.1 Biogeographic Provinces

Guyana is situated in the neo-tropical bio-geographical province of northeastern South America and is home to a vast expanse of primary tropical forest, freshwater and other unique ecosystems. Guyana is part of the Guiana Shield region which forms part of the Amazon Biome (Figure 1). The Amazon Biome, spanning 6.7 million km², is the single largest remaining tropical rainforest in the world and is home to at least 10% of the world's known biodiversity¹⁵.



Figure 1: Map¹⁶ showing Guyana in relation to South America, Amazonia, and the Guiana Shield Biogeographic Provinces.

The Guiana Shield is a geomorphologic complex that is extremely rich biologically located in northeastern South America. The variety of landscapes of the Guiana Shield includes sandstone tepuis, granite inselbergs, white sands, seasonally flooded tropical savannahs, lowlands with numerous rivers, isolated mountain ranges, and coastal swamps, each supporting a characteristic vegetation¹⁷. This variety accounts for a great deal of the high diversity and endemism of the Shield's biota. The highlands of the Shield have a flora and fauna with numerous endemic species¹⁸.

¹⁵ WWF-Guianas Living Guianas Report, 2012.

¹⁶ Map sourced from the *WWF Living Guianas Report, 2012*.

¹⁷ Huber *et al.*, 1995. Huber, 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.

¹⁸ 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.

1.3.2 Landscapes and Ecosystems

Guyana is usually considered to consist of four (4) main natural regions¹⁹: Coastal Plain, Hilly Sand and Clay Region, Interior Savannas, and Forested Highlands, although the FAO 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 Natural Regions are shown in Figure 2 and the Physiographic Regions according to the FAO in Figure 3.

The Coastal Plain

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 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 2). 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 plain 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.

¹⁹ Text on Guyana's main natural regions taken from Guyana's National Land Use Plan, 2013.

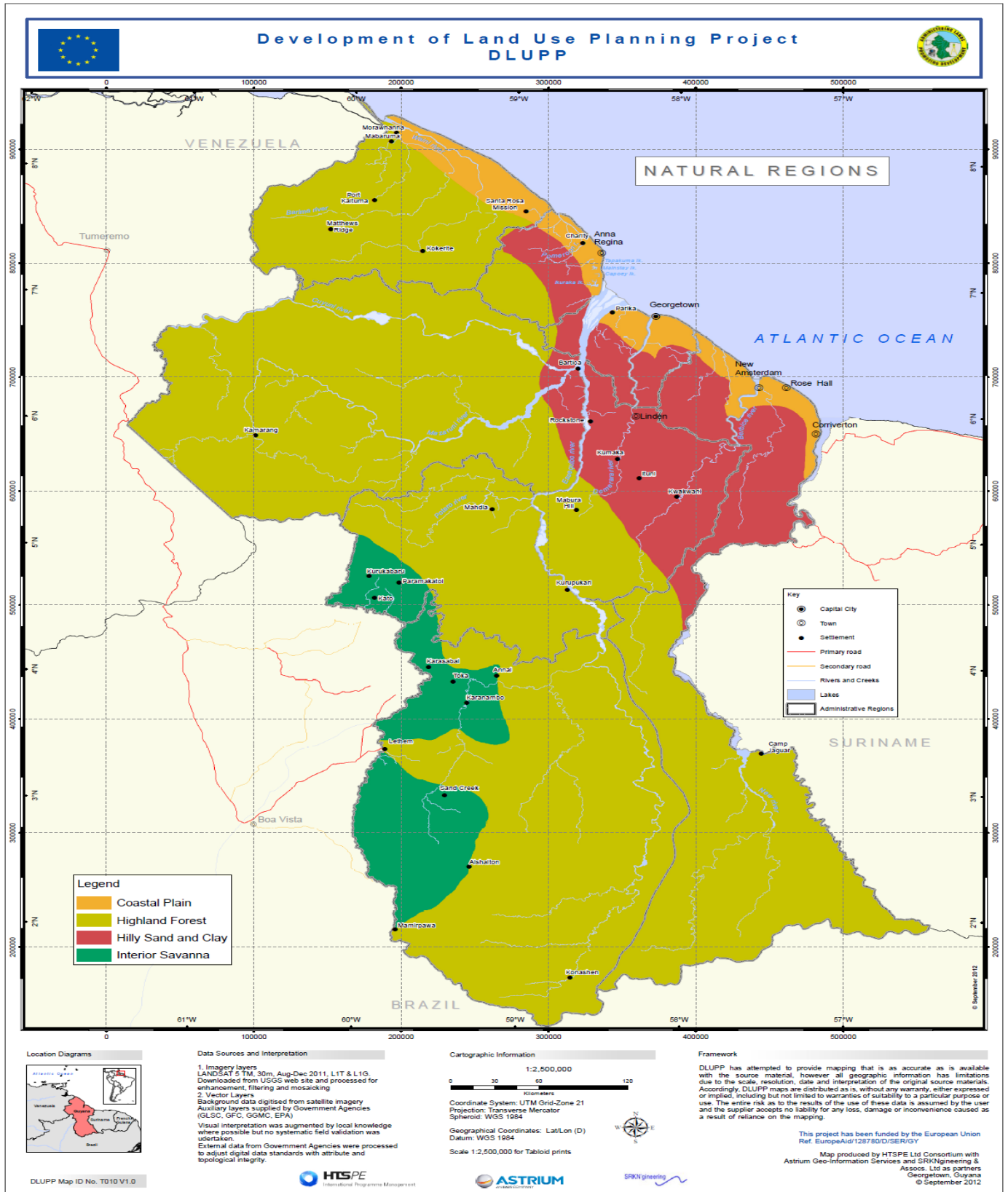


Figure 2: Map showing Guyana's Natural Regions.

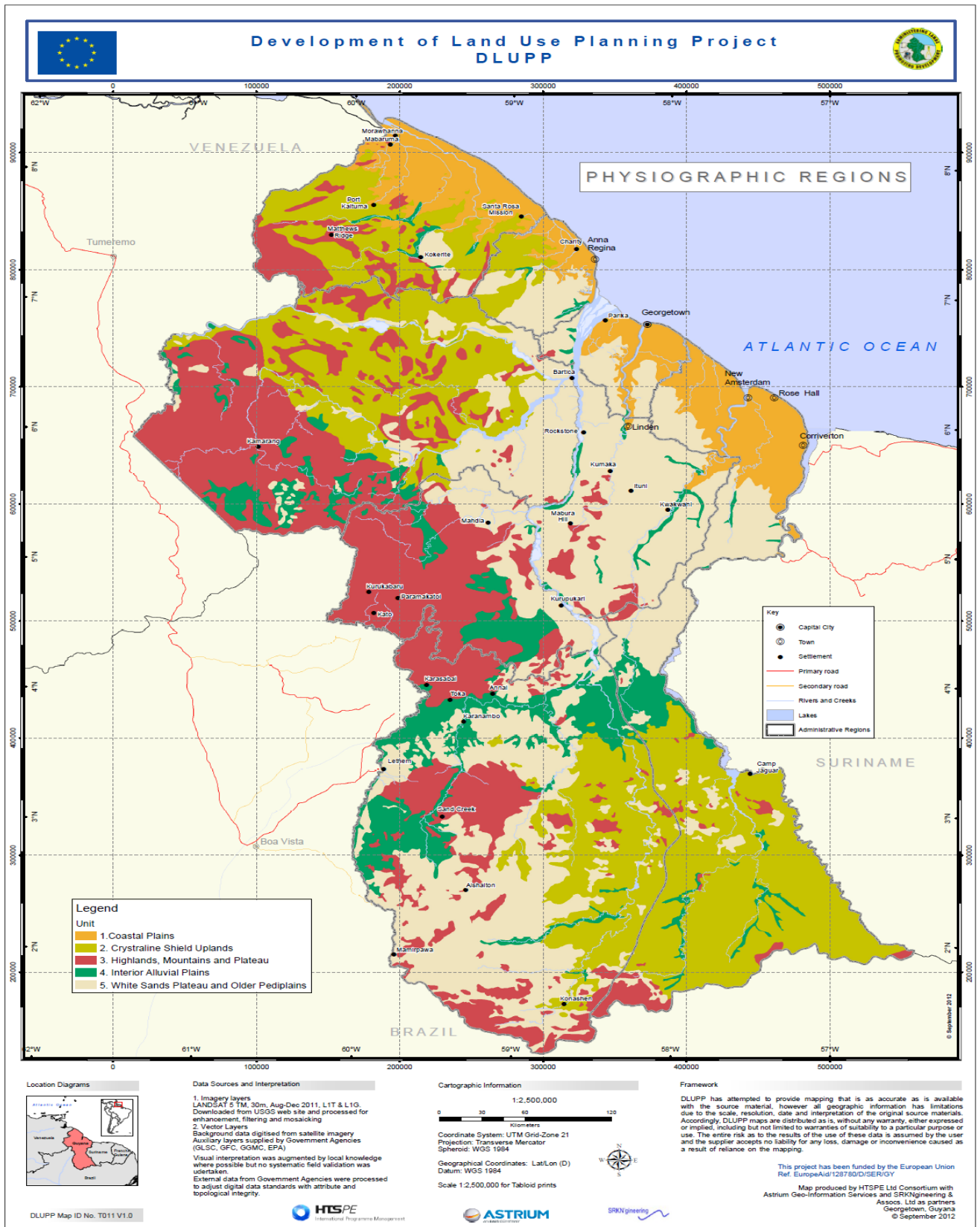


Figure 3: Map showing Guyana's Physiographic Regions.

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 3) 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 region 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 about 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 Savannahs 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 3).

The Savannah itself is generally flat but in places is 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 Guyana²⁰ as follows:

1. Forests in the coastal plain (Venezuela-Guyana-Suriname-French Guiana); includes mangroves 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

²⁰ 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.

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); include the dry to moist forests 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 savannahs. 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 savannahs 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.

Freshwater and Wetland Ecosystems

Three freshwater eco-regions exist within Guyana²¹. 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 Guyana²².

Coastal Ecosystems

Guyana is sandwiched between the estuaries of the Amazon and Orinoco Rivers and the movement of coastal currents and shoals impact 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 Area²³ 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

²¹ Freshwater Ecoregions of the World (FEOW). <http://www.feow.org/globalmap>.

²² 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](#).

²³ Text on the Shell Beach Protected Area taken from Guyana's Protected Areas Commission Protected Areas System Plan, 2013-2015.

variety of parrots and macaws, numerous wading birds including many scarlet ibis (*Eudocimus ruber*) and 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 including artisanal fishery, composed mainly of prawns and shrimp (sea bob), is an important contributor to the national economy comprising just under 6% of GDP²⁴. 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 Brazil²⁵.

1.3.3 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 virus²⁶.

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 threatened²⁷. Guyana has a total of 1182 native tree species²⁸ of which 1 species *Vouacapoua americana* is listed Critically Endangered. Three species: *Trichilia surumuensis*, *Aniba rosaedora*, *Virola surinmensis*, are listed as Endangered and a total of 18 species are listed as Vulnerable²⁹.

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: Sun parakeet (*Aratinga solstitialis*); Hoary-throated spinetail (*Synallaxis kollari*); and,

²⁴ Guyana National Land Use Plan, 2013.

²⁵ Eka, W. and B. A. Knoppers, (2003). A review and redefinition of the Large Marine Ecosystems of Brazil, p 355-372 In Sherman, K. and Hempel, G. (eds.), 2006. Large Marine Ecosystems of the World: Trends in Exploitation, Protection and Research. Elsevier Science. Amsterdam, The Netherlands.

²⁶ Guyana's Fourth National Report to the Convention on Biological Diversity. Environmental Protection Agency, 2010.

²⁷ World Wildlife Fund (WWF)- Guianas, 2012. Wetlands of Guyana – An insight into the ecology of selected wetlands with recommendations from WWF-Guianas.

²⁸ FAO, Global Forest Resources Assessment 2005. <http://www.fao.org/forestry/country/20807/en/guy/>.

²⁹ The conservation status of species sourced from the IUCN Red List of Threatened Species. Version 2014.2. <www.iucnredlist.org>.

the Red siskin (*Carduelis cucullata*). Guyana has no listed Critically Endangered or Endangered freshwater vertebrates.

The IUCN Red List Endangered marine species known to occur in Guyana include: the Green Sea Turtle (*Chelonia mydas*), the Nassau Grouper (*Epinephelus striatus*), the Scalloped Hammerhead (*Sphyrna lewini*), the Squat-headed Hammerhead Shark (*Sphyrna mokarran*), the Atlantic Bluefin Tuna (*Thunnus thynnus*), the Sei Whale (*Balaenoptera borealis*), the Blue Whale (*Balaenoptera musculus*), and the Fin Whale (*Balaenoptera physalus*). The Critically Endangered marine species include: the Daggernose Shark (*Isogomphodon oxyrinchus*); the Caribbean Electric Ray (*Narcine bancroftii*); the Largetooth Sawfish (*Pristis pristis*), and the Hawksbill Sea Turtle (*Eretmochelys imbricata*).

The local conservation status of the IUCN Red List of threatened species reported is not known. Guyana has no adopted or proposed list of threatened or endangered species. Despite their IUCN listing internationally, evidence supported by several studies suggests that the IUCN Red List threatened species that occur in Guyana are found in healthy populations throughout their ranges in Guyana. Pickles *et al* (2009)³⁰ conducted a biodiversity assessment of the head of the Rewa River in southern Guyana. Their survey documented a high density of the threatened species (50% of Guyana's threatened species were observed) within the Rewa Head. Lim *et al* (1999)³¹ biodiversity study conducted in the Iwokrama forest of central Guyana showed that the Iwokrama forest supports healthy populations of Guyana's threatened species.

1.3.4 Endemism

Guyana is not a phylogeographic 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 Guyana³². Local plant endemism is often associated with such habitats as white sands, serpentine rock, swamps, flood plains, rock outcrops and cloud forest³³.

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.²⁰

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.

1.3.5. Genetic Diversity

Limited genetic research and cataloging has been conducted in Guyana with the exception of plant genetic resources for food and agriculture (PGRFA) where substantial progress was made in conservation management and sustainable use. Sugarcane and rice are the twin pillars of Guyana's agriculture sector and provide an income for more than 20% of the Guyanese population that depend upon agriculture for their livelihoods.

Arable land in Guyana accounts for more than 400,000 hectares. Approximately 161,874 hectares of land are under cultivation consisting mainly of sugarcane and rice and other crops such as coconut, cassava, citrus and other fruits³⁴. Except for cassava, all agricultural products, important for food security and

³⁰ Pickles, R., McCann, N. and A. Holland, 2009. A Biodiversity Assessment of the Rewa Head, Guyana. ZSL Conservation Report No. 10. The Zoological Society of London, London

³¹ Lim, B., Engstrom, K., Mark D. and F. A. Reid, 1999. Guide to the Mammals of the Iwokrama Forest. Iwokrama International Centre for Rainforest Conservation.

³² Steege, H. ter, 2000. Plant Diversity in Guyana, with recommendations for a National Protected Area Strategy. The Tropenbos Foundation. Tropenbos Series 18.

³³ Gentry, A. H., 1992. Tropical Forest Biodiversity: distributional patterns and their conservational significance. *Oikos* 63: 19-28.

³⁴ Guyana's 2nd National Report to the FAO on PGRFA, 2012.

commercial exports are produced on the narrow coastal plains. The dairy and beef cattle, swine, poultry, sheep, goats, wildlife and other livestock such as rabbits and bees that comprise Guyana's livestock sector, are spread all over the country.

1.3.6 Protected Areas and Priorities for Conservation

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.

SECTION I: STATUS, TRENDS, THREATS AND IMPLICATIONS FOR HUMAN WELL-BEING

2. Importance of Biodiversity to the Economy and Human Well-Being

Biodiversity, as defined by the CBD, includes not only diversity within species populations and the number of species but also the diversity of ecosystems. Both the quantity and quality attributes of biodiversity are important when considering the links between nature, economic activity and human well-being. The global initiative on “The Economics of Ecosystems and Biodiversity” (TEEB³⁵) recognizes four groups of ecosystem services and associated benefits for human well-being as outlined in Box 1.

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, 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.

BOX 1: THE FOUR GROUPS OF ECOSYSTEM SERVICES AND ASSOCIATED BENEFITS RECOGNISED BY TEEB.

Provisioning Services – benefits from products obtained from ecosystems such as food, building materials, fuel, water, and medicinal resources.

Cultural Services - non-material benefits people obtain from ecosystems, e.g. spiritual enrichment, intellectual development, traditional knowledge, recreation and aesthetic values, and tourism.

Regulating Services – benefits obtained from the regulation of climate, air quality, carbon sequestration, natural hazards such as floods, landslides, erosion prevention, and, pollination and biological control.

Habitat or Supporting Services – provide habitat for migratory species and to maintain the viability of gene-pools.

2.1 Benefits from Regulating Services

Forest and Climate Regulation

Guyana, like most low-lying coastal states and with approximately 90% of the population living on a coast that is 1-2 m below sea level, is extremely vulnerable to the effects of climate change. One of the major contributors to global warming is tropical deforestation and with over 87% of the country is covered in forest Guyana believes that its forest can play an important role in climate regulation and thereby assist in addressing the global problem of climate change and its effects. At the same time, it is recognised 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 and agriculture. Significant mineral deposits also exist below the surface. The Office of the President, based on an independent assessment, 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 billion³⁶. 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.

³⁵ TEEB, 2010. The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB. <http://www.teebweb.org>.

³⁶ Low Carbon Development Strategy, 2010. Office of the President. <http://www.uncsd2012.org/content/documents/Revised-LCDS-May-20-2010-draft-for-MSSC.pdf>.

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, 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 year².

Following up on its belief that Guyana can play an important role in addressing the global problem of climate change and its effects, the GoG, in 2009, signed a memorandum of understanding (MOU) with the Kingdom of Norway committing Norway to provide US \$250 million in support of Guyana's avoided deforestation efforts up to 2015 and the building of a working model of REDD+. At the time of preparing this report, Guyana had earned US\$115 million from Norway under this partnership from three consecutive payments and a fourth payment is expected. This represents the second largest interim REDD+ mechanism globally (the Brazil-Norway partnership being the first) while maintaining 99% of its forests.

2.2 Benefits from Provisioning Services

Forests Products

The forest resources of Guyana are used for multiple purposes including for wood and wood products particularly for export and for use in the local construction industry, for non-timber forest products (used for furniture and crafts), fuel, and ecotourism. They are also an important source of food and medicines for Amerindian communities.

Sawn wood continues to be the highest earner in the wood export market for Guyana, accounting for US \$19.67 M in 2013 compared with US \$19.37 M in 2012 (Table 1). There continues to be a high International demand for Guyana's hardwood logs and lumber (Figure 4).

Table 1: Forest Product Export Summary Year 2013³⁷.

PRODUCT	Jan – Dec 2012		Jan – Dec 2013		% Change Over	
	Volume	Value	Volume	Value	Jan – Dec 2012	
	m ³	US\$	m ³	US\$	% Vol	% Val
Logs	82,875.21	13,926,410.67	76,615.79	12,451,749.35	(7.55)	(10.59)
Sawnwood	23,976.60	19,375,960.18	22,835.09	19,676,530.60	(4.76)	1.55
<i>Dressed</i>	8,266.86	9,536,556.49	7,757.95	9,172,635.37	(6.16)	(3.82)
<i>Undressed</i>	15,709.74	9,839,403.69	15,077.14	10,503,895.23	(4.03)	6.75
Roundwood	6,097.52	2,348,129.57	6,380.28	2,774,713.41	4.64	18.17
Splitwood	1,934.48	1,751,795.03	1,781.22	1,730,696.43	(7.92)	(1.20)
Plywood	4,344.08	2,193,745.76	4,714.50	2,369,415.27	8.53	8.01
TOTAL TIMBER & PLYWOOD	119,227.89	39,596,041.21	112,326.88	39,003,105.06	(5.79)	(1.50)
Furniture (pcs)	154.00	20,196.40	250.00	52,896.32	62.34	161.91
Building Comp. (pcs)	2,201.00	131,342.12	3,336.00	177,579.41	51.57	35.20
Mouldings (m)	19,663.25	38,874.92	27,373.19	79,028.30	39.21	103.29
Pre-Fabricated Houses (pcs)	1.00	12,883.63	-	-	-	-
OTHER (than Plywood) VALUE ADDED	22,019.26	203,297.07	30,959.19	309,504.03	40.60	52.24
Fuelwood (m ³)	9,297.07	214,297.07	8,164.33	196,480.92	(12.18)	(8.52)
Other – Craft, Ornament (pcs)	10,269.00	19,512.97	10,211.00	99,856.25	(0.56)	411.74
Non - Timber Forest Products (pcs)	2,346.00	38,117.00	1,264.00	19,519.50	(46.12)	(48.79)
OTHER PRODUCTS	21,912.07	272,421.01	8,441.50	315,914.67	(61.48)	15.97
TOTAL EXPORT VALUE		40,071,759		39,628,523.76		(1.11)

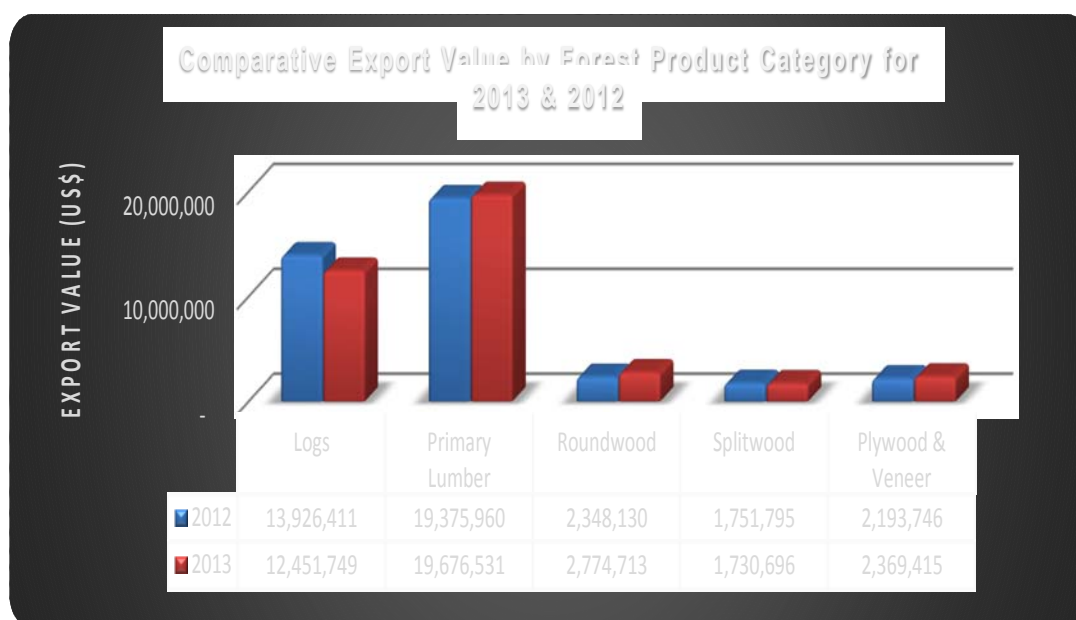


Figure 4: Graph Showing Comparative Export Value by Forest Product Category for 2013 and 2012³⁸.

During 2013, there was an overall 1.11% decline in the total wood export value when compared to year 2012. However, this marginal decline was attributed to the increased domestic demands for timber products in the housing and construction industry, as well as the utility sub-sector. This trend is expected

³⁷ Forest Sector Information Report - Annual Review, 2013. Guyana Forestry Commission. <http://www.forestry.gov.gy>.

³⁸ Forest Sector Information Report - Annual Review, 2013. Guyana Forestry Commission. <http://www.forestry.gov.gy>.

to continue with the emergence of a number of housing schemes and other developments.

Agriculture

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 (Box 2³⁹). 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).

Two of Guyana's agricultural products are ranked among the top 10 in the world. These are Natural Gums (#2) and Cashew Apples (#4). There are 19 other agricultural commodities ranked between 2-49 and another 19 ranked between 52-174 (Table 2).

Box 2: Summary of Agriculture Contribution to the Economy.

- ▲ AGRICULTURE CONTRIBUTES ALMOST 20% TO OUR ECONOMY
- ▲ AGRICULTURE ACCOUNTS FOR MORE THAN 33% OF EMPLOYMENT IN OUR COUNTRY
- ▲ ALMOST 40% OF GUYANA'S EXPORT EARNINGS COME FROM AGRICULTURE.
- ▲ AVERAGE OF ABOUT 11% OF THE NATIONAL BUDGET ESTIMATES GO TO AGRICULTURE

³⁹ A National Strategy for Agriculture in Guyana, 2013-2020. Ministry of Agriculture. <http://agriculture.gov.gy/National%20Agriculture%20Strategy%202013-2020.pdf> .

Table 2: World ranking of Guyana in production of different agri-commodities⁴⁰ (value wise).

World Ranking	Commodity	World Ranking	Commodity
2	Gums Natural	52	Cherries
4	Cashew apple	55	Eggplants (aubergines)
23	Ginger	59	Pineapples
27	Pepper (Piper spp.)	60	Avocados
31	Cow peas, dry	60	Grapefruit (inc. pomelos)
31	Okra	61	Coffee, green
33	Coconuts	66	Mangoes, mangosteens, guavas
33	Taro (cocoyam)	70	Cassava
33	Spices, nes	74	Lemons and limes
37	Plantains	76	Pumpkins, squash and gourds
37	Roots and Tubers, nes	85	Oranges
38	Fruit, tropical fresh nes	85	Sweet potatoes
39	Sugar cane	87	Chillies and peppers, green
39	Beans, green	90	Bananas
42	Rice, paddy	95	Cucumbers and gherkins
43	Broad beans, horse beans, dry	99	Watermelons
44	Cocoa beans	120	Honey, natural
44	Yams	126	Tomatoes
49	Citrus fruit, nes	132	Cabbages and other brassicas

During 2013, about 12,700 tonnes of fresh fruits, vegetables and processed foods valued at US \$6.95 M (G \$1.4 B) were exported to Caribbean region and other countries.

⁴⁰ A National Strategy for Agriculture in Guyana, 2013-2020. Ministry of Agriculture. <http://agriculture.gov.gy/National%20Agriculture%20Strategy%202013-2020.pdf>.

Table 3: Major non-traditional crops exported from Guyana during 2010-2013⁴¹.

COMMODITY	EXPORT VOLUME (tonnes)				EXPORT VALUE	
	2010	2011	2012	2013	G \$	US \$
					2013	2013
Coconut (dry)	5,449	7,883	8,630	10,213	612,801,840	3,003,930
Copra	901	734	971	755	133,170,213	654,585
Heart of Palm	489	393	320	386	211,813,852	1,040,522
Crude (coconut oil)	361	357	334	289	79,502,572	390,099
Mango	328	170	182	163	40,988,094	201,187
Pumpkin	546	452	189	146	26,135,174	128,417
Watermelon	479	289	84	116	19,510,190	95,843
Coconut (Water)	231	461	132	94	21,206,100	104,272
Eddo	95	157	61	89	30,433,402	149,419
Pineapple	60	106	52	71	26,580,688	130,520
Copra Meal	82	7	0	61	19,939,770	97,744
Sauces	6	2	35	54	36,899,750	173,540
Pepper (wiri wiri)	56	38	41	42	32,588,938	160,178
Lime	78	85	21	29	14,697,882	72,367
Breadnut (Katahar)	10	9	12	22	13,731,761	67,386
Other Exports	329	407	116	169	96,307,741	480,647
TOTAL	9,561	11,621	11,186	12,700	1,416,307,967	6,950,655

The livestock industry contributed more than US \$58 M to Guyana's economy. Guyana is self-sufficient in fresh meats. Table 4 provides an overview of livestock production over the past five years. Livestock production is still well below potential capacity.

Table 4: Livestock Production in Guyana (2009-2013)⁴².

	Unit	2009	2010	2011	2012	2013
Poultry Meat	KG	27,086,806	24,969,212	25,573,466	30,452,761	29,280,260
Table Eggs	Each	18,914,422	14,169,197	23,508,323	21,234,317	17,964,574
Beef	KG	2,110,394	2,260,339	2,153,320	1,635,374	2,262,373
Mutton	KG	95,017	99,750	167,080	129,391	125,551
Pork	KG	265,906	304,639	202,599	199,048	571,962
Milk	Liters	30,900,000	26,800,000	34,175,857	39,191,368	46,483,931

The fishing industry continues to grow in economic importance in Guyana. Approximately 21,500 persons are employed in this industry and many more indirectly through boat building, repair and supply of equipment. It provides a source of relatively cheap animal protein. In 2003, the estimated per capita

⁴¹ A National Strategy for Agriculture in Guyana, 2013-2020. Ministry of Agriculture. <http://agriculture.gov.gy/National%20Agriculture%20Strategy%202013-2020.pdf>.

⁴² A National Strategy for Agriculture in Guyana, 2013-2020. Ministry of Agriculture. <http://agriculture.gov.gy/National%20Agriculture%20Strategy%202013-2020.pdf>.

annual consumption of fish in Guyana was 54 kg which was among the highest per capita consumption of fish and fish products within the Caribbean region. Table 5 shows fish and prawn exports and value for 2008-2013.

Table 5: Annual Exports for Fish, Prawns and Fish products (2008-2013)⁴³.

ITEM	2008	2009	2010	2011	2012	2013	
	WEIGHT (MT)	WEIGHT (MT)	WEIGHT (MT)	WEIGHT (MT)	WEIGHT (MT)	WEIGHT (MT)	VALUE (G\$000)
Prawns	623	823	641	294	280	560	1,628,310
Sea bob/Whitebelly	9,686	9,669	8,773	9,114	12,509	11,091	7,933,965
Shrimp Dried	15	10	10	2	16	7	9,077
Fish Frozen	7,935	8,210	5,706	6,983	7,880	8,337	3,998,816
Fish Fresh		0	0	0	1	6	2,591
Fish Salted	0	0	0	0	0	3	273
Fish Smoked	19	36	15	54	75	154	53,186
Fish Fillets	379	486	540	577	905	825	496,488
Fish Dried	214	215	123	264	75	121	105,340
Fish Eggs	7	9	14	32	39	25	1,164
Fish Glue	95	96	98	156	141	171	427,154
Shark Salted	23	10	56	21	43	1	517
Shark Fin	36	36	28	68	23	38	209,409
Shark Bones		7	0	0	0	6	0
Crab Meat/Back	22	22	20	15	22	20	13,625
Live Crab	1	0	0	0	0	1	269
Squid	10	17	9	0	0	0	0
Ornamental Fish	29	23	4	0	2	37	8,357
TOTAL	19,094	19,669	16,037	17,581	22,011	21,403	14,888,541

US \$1= G \$206

Freshwater and Hydropower

One key ecosystem service provided by forests and inland freshwater ecosystems is the provision of freshwater. Guyana is listed among the top five water surplus countries of the world and has an annual per capita water availability of 314,963 m³ (water availability of 241 km³ and a population of 765,169) indicating an enormous water surplus⁴⁴.

Results from the US Army Corps of Engineers in a 1998 national water resources study showed that about 90% of the Guyana's domestic water supply comes from groundwater sources, and the remaining 10% from surface water. The study also reported that industrial water supply comes from both surface and ground water and approximately 40% of the ground water supply is for industrial uses and needs. The GoG is currently pursuing initiatives towards integrated water tourism management with the development of a Strategy.

⁴³ A National Strategy for Agriculture in Guyana, 2013-2020. Ministry of Agriculture. <http://agriculture.gov.gy/National%20Agriculture%20Strategy%202013-2020.pdf>.

⁴⁴ National Land-Use Plan, 2013.

A 165 MW Hydropower Project for Amaila Falls is currently being developed in keeping with Guyana's development objective of re-orienting the economy towards low carbon growth. The Amaila project has the potential to satisfy 90% of Guyana's current power demand and to enable the country to be self-sufficient in providing abundant low-cost power for development of industry, agriculture and domestic needs. There are other on-going initiatives such as the establishment of the Kato micro-hydropower plant as well as initiatives to explore joint collaboration between Guyana and Brazil on hydropower development.

2.3 Benefits from Cultural Services

Tourism

The contribution of tourism to the national economy has increased over the last 10 years (Table 6). In 2013, visitor arrivals totaled 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.

Table 6: Guyana Travel & Tourism Total Contribution to GDP⁴⁵.

Guyana	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Travel & Tourism Total Contribution to GDP										
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

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. Ecotourism was identified as a high-potential low carbon sector within the LCDS framework and was highlighted as one of three focal areas for the 2013–2015 period. 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 average rate of 20% in the Rupununi and Guyana went from two international tour operators booking trips to over 45 international tour operations booking trips⁴⁶.

⁴⁵ World Travel and Tourism Council (WTTTC). Data generated in May 31, 2014 using the WTTTC economic data search tool. <http://www.wttc.org/research/economic-data-search-tool/>.

⁴⁶ Guyana's Low Carbon Development Strategy, 2013.

According to the National Budget 2014, work has commenced on the development of a Hinterland Tourism Development Plan and focus continues to be placed on community-based tourism.

The Rupununi Region is well recognized home to a large number of species found in Guyana and some endemic species of the Guiana Shield and is one of the most attractive tourist destinations in Guyana⁴⁷. The presence of the Iwokrama International Programme in the Region and its work over the last 25 years in demonstrating sustainable forest utilization and conservation and working closely with the local Amerindian communities has helped to raise the profile of the Rupununi both in terms of its high conservation value as well as significant ecotourism potential. In addition to Iwokrama's own tourism initiatives which have been very successful in raising Guyana's international profile and that of the Rupununi, several of the communities have capitalized on the potential of the Region and have established successful community-based tourism businesses.

Rewa is another example. These communities have organized themselves through the North Rupununi District Development Board (NRDDB) and have established key partnership with tourism stakeholders including tour operators.

In the international arena, *National Geographic Traveler*, in 2011, pegged 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 Amerindian owned and operated Surama Eco-Lodge (Box 3⁴⁸) as one of the best hotels in South America for their 2011 Stay List.

In 2014, *Traveler* named Guyana as one of the 2014's must-see places on planet earth as it offered curious travelers an opportunity to experience one of only four remaining intact rain forest ecosystems on the planet.

Birdlife International has proposed a total of 10 Important Bird Areas for Guyana (Figure 5) with an area of more than 366,600 ha or 1.7% of the country's land area, which demonstrates the country's potential as a bird watching destination.

Box 3: Community-Based Economies - Surama, a Small Amerindian Community Eco-Tourism Enterprise.

Surama is a small Amerindian community of the Makushi people living in the north Rupununi. The village is situated within 13 km² of savannah land surrounded by forest, hills and the Pakaraima mountain range, and has a population of about 287 people whose quality of livelihood is directly dependent on the natural capital of the region. The **Surama Eco-tourism Enterprise** started modestly in the early 1990's 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 benefit more than 75% of people living in the village. Taxes charged per visitor go towards a community fund. Since its establishment, there has been a steady increase in visitors with an average of 190 visitors per year.

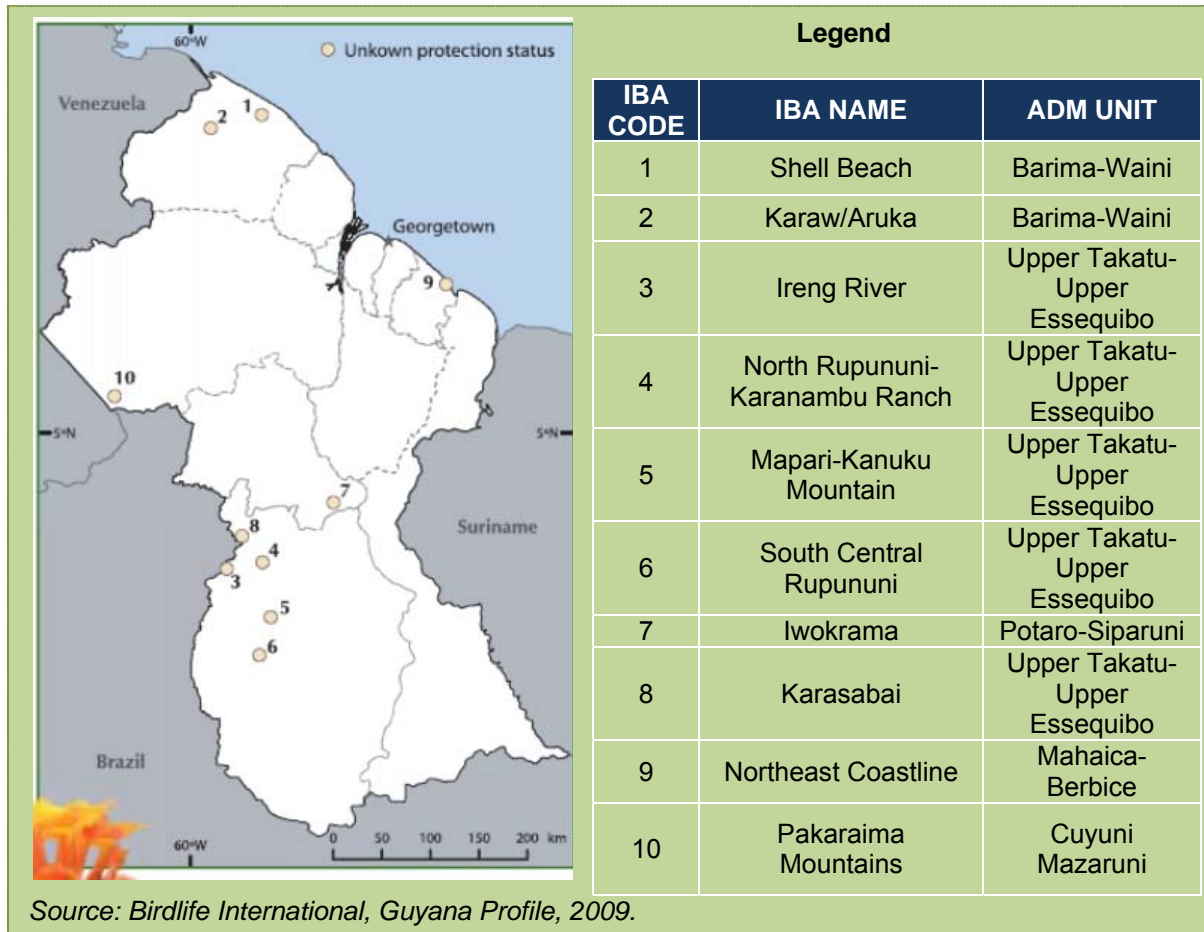
Rewa is another Amerindian community located in the north Rupununi in central Guyana. With about 300 inhabitants, the people of Rewa village are mostly from the Makushi tribe. The Rewa area is renowned for its abundance of wildlife and ecological diversity. The Rewa eco-lodge was started in 2005 with a community grant provided by Conservation International.

⁴⁷ Community Tourism Enterprise in the Rupununi. A Blueprint. Conservation International Guyana, 2010.

<http://www.exploreGuyana.org/wwwfiles/file/Community%20Tourism%20Enterprise%20Development%20in%20the%20Rupununi-%20A%20Blue%20Print%20coordinated%20by%20CIG.pdf>.

⁴⁸ Information downloaded from <http://suramaecolodge.com/> and Rewa Ec Lodge. Welcome to an adventure in wilderness spirit. <http://www.rewaguyana.com/Index.aspx>.

Figure 5: Location of Proposed Important Bird Areas in Guyana.



The Kaieteur National Park, Iwokrama Rainforest Reserve, the National Park, Zoological Park and the Botanical Gardens, all of which form part of the National Protected Areas System (NPAS), are also important tourism sites. Kaieteur Falls, considered to be one of the world's most impressive waterfalls, is Guyana's premier tourism site in the Kaieteur National Park. Water flows over Kaieteur Falls at an average of $553 \text{ m}^3 \text{ s}^{-1}$ over the waterfall making it one of the most powerful waterfalls in the world⁴⁹. Considerations for tourism development feature prominently in the Management Plans that are currently being developed for Kaieteur National Park, Shell Beach, and the Kanuku Mountains which also form part of the NPAS.

Under the *Three Parks Initiative*, which aims to revitalize the National Park, Zoological Park, and the Botanical Gardens, the Protected Areas Commission (PAC) has undertaken a number of park upgrades as well as initiated the development of several projects, one of which includes the completion of the Zoological Park Master Plan. The plan illustrates a cutting edge approach to restructuring and reorienting zoo exhibits based on ecosystem representativeness. The ecosystems to be featured in the new zoo layout include the Coastal Wetlands, Savannahs, Mountain Highlands and Rainforests. The new plan aims to encourage visitors and enhance informal education through interactive and engaging experiences. The realization of the Zoological Master plan resulted from collaboration with the private sector (the Beharry Group of Companies) and CI-Guyana.

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

⁴⁹ Draft NKP 5 Year Management Plan, 2012 -2017.

years (2011-2013), Guyana has dominated the Caribbean Tourism Organization (CTO) /TravelMole Sustainable Tourism Awards which recognizes individuals, groups, organizations or companies in any of CTO Member Countries. Guyana has won awards for sustainable tourism, heritage protection, biodiversity, and community benefit⁵⁰.

Communities including Amerindian Communities

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.

The Amerindian population has long been recognized as the stewards of Guyana's forests and continues to play a significant role in protecting and maintain forests both on their own Amerindian lands as well as lending support to national conservation efforts at both the ecosystem and species level.

In February, 2004, the GoG issued title to 6250 km² or approximately 1.5 million hectares (2.9% of Guyana's land area) of land in Southern Guyana in the Konashen Amerindian District, to be managed by the Wai Wais. Southern Guyana is host to some of the most pristine expanses of evergreen forests in the northern part of South America. The Smithsonian Institution has identified nearly 2,700 species of plants from this region, representing 239 distinct families.

In developing a plan for sustainable use, the Wai Wais identified the importance of biodiversity to the community (Box 4⁵¹).

The Wai Wais are currently pursuing the aligning of their titled land as the Konashen Community-Owned Conservation Area (COCA) within the NPAS.

The Amerindian Communities have also played a key role in the development and operations of the Iwokrama International Centre and the management of the Programme site. They are co-managers of the rainforest reserve and are involved in every aspect of the operations from monitoring patrols to being represented on the Board of Trustees - the highest level of decision-making for the Reserve. In the last 2 years, the communities are partners in the development of the first ever Community Monitoring Reporting

Box 4: The importance of biodiversity identified by the Wai Wai Amerindian Community

Ahce kacho xa tipine menatu comota chewno komo?

Why is biodiversity important to you?

- **On poyero miki kirwanhe`kesesitopo mimyasi comota.**
Produces and cleans the air that we breathe
- **Onmarha kirwanhe nirasi, roowo etahkara nirasi tuna marha.**
Keeps the soil in place so that it does not clog the waterways.
- **Onwara marha nirasi comota nusmunkes eepu ymo (Essequibo) kwaka tihtosom ahnororo komo wokrume.**
Absorbs rainfall, filters, and slowly releases water into the rivers and streams for us and all of the animals to drink.
- **On poyero marha ixexaxe miimo ciitopo me exirke weewe mko yimichi, kaksom miyarma.**
Provides wood and other products for our homes, clothing, rope, and baskets, among other things.
- **Mik hak marha nimyasi knahri komo weewe yeperiri titko, kitmo kom marha miya rma.**
Provides food that we eat everyday such as nuts, fruits, fish, and meat.
- **Comota chew nasi kehci komo kasaray me ciisom**
Is the source of both traditional and modern medicines.
- **Mikhak min me nasi comota. lito nasi anarmenpan weewe komo.**
Provides a home to many animal and plant species.
- **Nihtinomexpesi tuuna mohtopo katpan marha.**
Determines the climate of the southern Guyana region including when the rain comes and how long the dry season will last.

⁵⁰ Draft NBSAP, 2012-2020.

⁵¹ Rapid Assessment Program, 2008. Biodiversity in the Konashen Community-Owned Conservation Area. Guyana. Conservation International, Arlington, VA, USA.
http://www.conservation.org/publications/Documents/CI_Konashen_COCA_Biodiversity_Booklet.pdf.

and Verification (CMRV) System in Guyana. More than 50 persons from the 16 Amerindian communities have been trained in monitoring the health of the forests and ecosystems, measure their community forest carbon stocks and to assess the well-being of their community using open source software developed for mobile phones. The communities are also involved in a second initiative focusing on consolidating the community monitoring approach, building on and replicating international approaches, sharing lessons learnt and reviewing community MRV achievements and challenges⁵².

The important role of communities and community-based organisations (CBOs) and non-governmental organisations (NGOs) working at the community level in natural resources management and conservation has been well recognized and reflected in the preparation of the Global Environment Facility (GEF) Small Grants Programme (SGP) Country Strategy.

The GEF Small Grants Programme⁵³ (GEF SGP) was established in Guyana in 2012 following an application by the GoG, endorsement by UNDP and approval by the GEF Council under Operational Phase 5 (2011-2014). The SGP engagements with stakeholders indicated that the targeted beneficiaries' interests and priorities lie within the SGP focal areas of Biodiversity Conservation, Climate Change Mitigation, Land Degradation, and the Elimination of Persistent Organic Pollutants (POPs), with Civil Society Organisations (CSOs) indicating that they would like SGP to support the following projects:

- Biodiversity – community conservation programmes, biodiversity surveys, resource mapping, management planning, natural resources management training and awareness;
- Climate change – awareness programmes, low-carbon livelihood projects, community MRV programmes;
- Land degradation – flooding and erosion prevention projects;
- Persistent Organic Pollutants – Solid waste management and anti-littering programmes;
- Capacity building – governance, project management, policy and negotiation; and
- Cross-cutting/multi-focal – small-scale agriculture and livestock projects, agro-processing, ecotourism, environmental education and awareness, administrative support.

Figures 6, 7 and 8 show the profiles of CSOs consulted, environmental and livelihood issues that were identified during consultations.

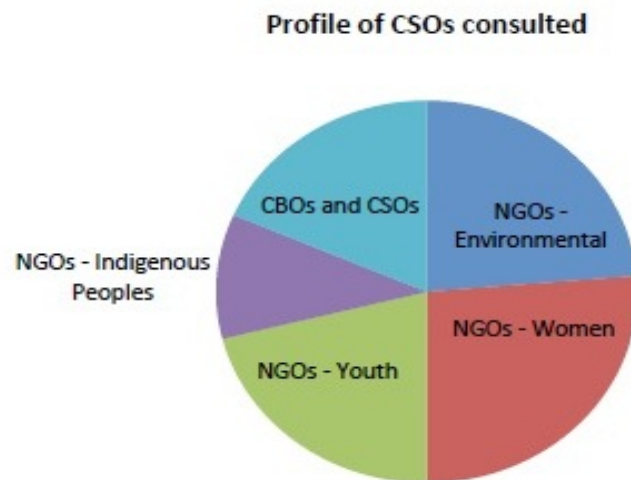


Figure 6: Profiles of Community Based organisations consulted⁵⁴.

⁵² Iwokrama Annual Report, 2012-2013. www.iwokrama.org.

⁵³ Country Programme Strategy, GEF SGP, Guyana.

<http://www.gy.undp.org/content/dam/guyana/docs/SGP%20Guyana%20CPS%20for%20OP5.pdf>.

⁵⁴ Country Programme Strategy, GEF SGP Guyana.

<http://www.gy.undp.org/content/dam/guyana/docs/SGP%20Guyana%20CPS%20for%20OP5.pdf>.

Environmental Issues Identified by CSOs consulted

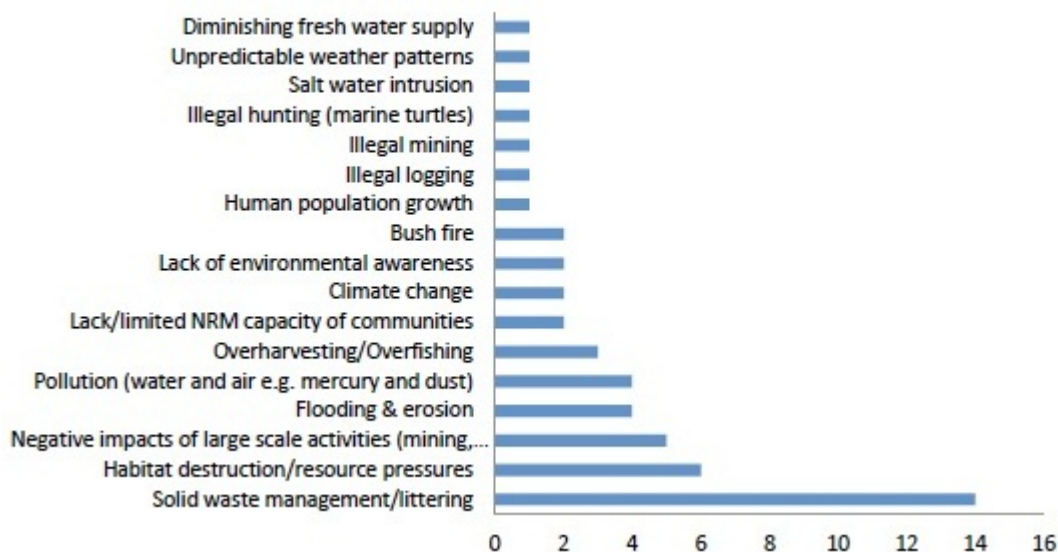


Figure 7: Environmental Issues Identified at Community Consultation meetings⁵⁵.

Livelihood Issues Identified by CSOs consulted

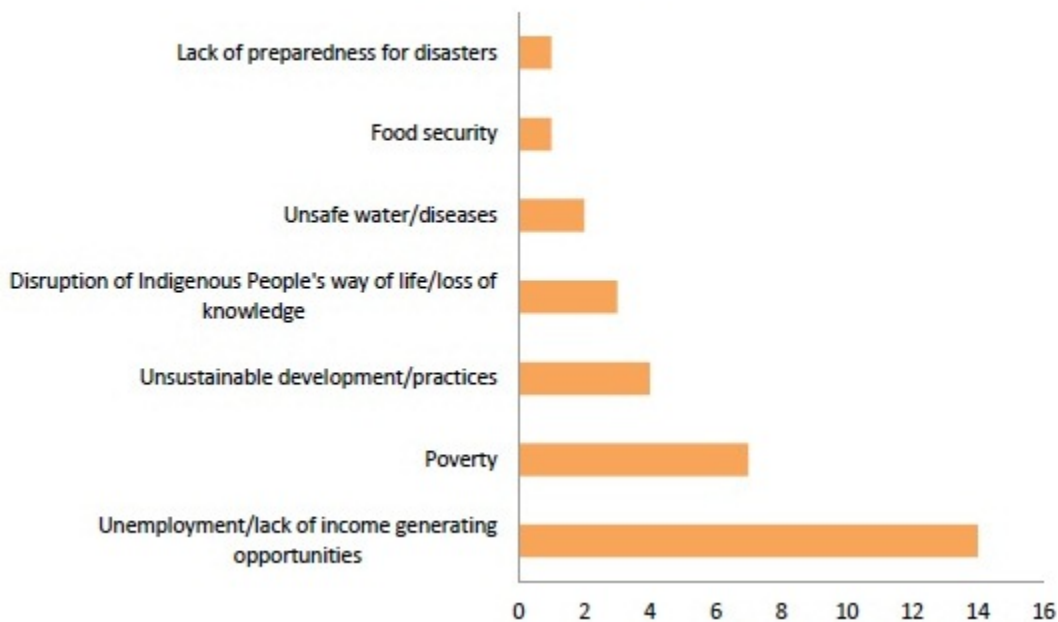


Figure 8: Livelihood issues identified during consultations with CBOs⁵⁶.

By the end of 2013, SGP Guyana committed 90% of its allocation through the approval of eight grants. The total value of the grants approved amounted to US \$606,077 with SGP contributing US \$313,189

⁵⁵ Country Programme Strategy, GEF SGP Guyana. <http://www.gy.undp.org/content/dam/guyana/docs/SGP%20Guyana%20CPS%20for%20OP5.pdf>.

⁵⁶ Country Programme Strategy, GEF SGP Guyana. <http://www.gy.undp.org/content/dam/guyana/docs/SGP%20Guyana%20CPS%20for%20OP5.pdf>.

while co-financing amounted to US \$292,888. The projects cover SGP focal areas of Biodiversity Conservation, Sustainable Forest Management, Climate Change and Chemicals. The grantees comprised a women's group, a youth group, five Amerindian Peoples group and one farmer's group. The projects will be implemented across six of the ten administrative regions in Guyana, benefitting both coastal and hinterland communities. A profile of the approved projects is presented in Table 7.

Table 7: Profile of SGP projects approved in 2013⁵⁷.

Grantee	Project Title	Project Description	Total value of Project (US\$)	Funding provided by SGP (US\$)
1. North Rupununi District Development Board	Strengthening capacity to support local implementation of fisheries monitoring and management in the North Rupununi Wetlands	The project seeks to develop the capacities of 16 Amerindian communities to manage the Arapaima fish and fisheries of the North Rupununi via capacity building, arapaima surveys, conservation education and awareness, consultations and development of management plans.	78,115.00	49,325.00
2. South Rupununi Conservation Society	Training of Ranger-Researchers in the South Rupununi, in collaboration with the "Ongoing Protection of Red Siskins in South Rupununi" CLP Project	The project seeks to protect the Red Siskin bird through capacity development of individuals from the six Amerindian communities where the bird exists in the areas of bird research, tour guiding, ranger training/monitoring, and conservation awareness.	70,491.00	34,146.00
3. Global Youth Movement-Guyana	Community and Farmers Environment, Health and Recycling Project	The project seeks to address the improper disposal of PET plastics and burning of solid waste in Region 5, and the improper use, storage and management of farming chemicals which contributes to soil degradation, and to reduce the use of mercury in gold mining and jewellery production	115,907.50	50,000.00
4. Guyanese Women in Development	Community led Mangrove Restoration: Towards Sustainable Management of Guyana's Mangrove Forest	The project seeks to address climate change by replanting 2km mangroves (carbon sequestration through reforestation) at Mon Repos, Victoria and potentially Buxton on the ECD, and No. 43 Village – Wellington Park in Corentyne. The project also includes community monitoring, awareness and income generating activities.	100,000.00	50,000.00

⁵⁷ SGP Guyana Report, 2013.

https://sgp.undp.org/index.php?option=com_docman&task=doc_details&qid=447&Itemid=188#U_FZ-1avtFI

Grantee	Project Title	Project Description	Total value of Project (US\$)	Funding provided by SGP (US\$)
5. Guyana Agriculture Producer's Association	Capacity Building and Protected Agriculture Demonstration for Farmers in Guyana	The project seeks to address climate change impacts on the agricultural sector by building capacity amongst poor, rural and vulnerable vegetable farmers in Regions 2, 3, 4, 5 and 6 by providing training and setting up demonstration facilities in Hydroponics and Grow Box/ Shade Houses.	103,415.00	50,000.00
6. Kanuku Mountains Community Representative Group	Building climate change resilience amongst the 21 communities of the KMPA	The project seeks to develop the capacities of the KMCRG and the 21 Amerindian communities of the Kanuku Mountains Protected Area (KMPA) on climate change and the role forest play in mitigating climate change.	88,849.50	49,479.50
7. South Central People's Development Association	Safeguarding Katoonari's bush island forests through savannah farming	The project seeks to demonstrate savannah farming as an alternative to shifting cultivation which contributes to deforestation and climate change.	44,198.00	25,238.00
8. Aishalton Village Council	Reducing deforestation in Aishalton Village through savannah farming	The project seeks to plant upland rice in the savannah as opposed to clearing forests to plant rice which contributes to deforestation and climate change	0.00	5,000.00
			606,077.00	313,188.50

2.4 Benefits from Habitat or Supporting Services

Freshwater Ecoregions of the World (FEOW⁵⁸) was jointly developed by the Conservation Science Program of World Wildlife Fund and by The Nature Conservancy. It provides a new global biogeographic regionalization of the Earth's freshwater biodiversity and covers virtually all freshwater habitats on Earth. According to the FEOW, there are three freshwater eco-regions which span Guyana as described below.

1. Orinoco Delta & Coastal Drainages Freshwater Eco-region

This eco-region includes the entire Orinoco Delta complex in Venezuela extending inland to Barrancas along the main stem of the Orinoco, all of the small rivers draining directly into the delta, and adjacent Atlantic coastal drainages in northwestern Guyana. The latter categories include east flowing rivers entering the Gulf of Paria, and northern Orinoco Delta; small north flowing tributaries entering the delta east of Barrancas (e.g. Manaco, Aguirre, and Barima); and coastal rivers entering the Atlantic between the eastern mouth of the Orinoco Delta and the Essequibo drainage divide (e.g. Barama, Pomeroon, and Waini). The Orinoco deltaic plains form one of the largest wetland complexes in South America, and together are a highly productive nursery, feeding, and breeding area for a number of freshwater and marine organisms. The Orinoco Delta is an important area for migrating and breeding aquatic birds. Notable species include the scarlet ibis (*Eudocimus ruber*), American flamingo (*Phoenicopterus ruber*), and the sandwich tern (*Sterna sandvicensis*).

⁵⁸ Fresh Water Ecoregions of the World. <http://www.feow.org>.

The Orinoco Delta provides nursery habitats for migrating goliath catfish like the piraiba or kumakuma (*Brachyplatystoma filamentosum*), Laulao catfish (*B. vaillantii*), and dourada (*B. rousseauxii*), as well as the jaú or gilded catfish (*Zungaro zungaro*).

2. Essequibo Freshwater Eco-region

This eco-region includes the entire Essequibo River basin in Guyana and part of southeastern Venezuela where it drains the eastern margin of the Guiana Shield and low country south of the Orinoco Delta. The Essequibo is a biogeographically complex basin that hosts both endemics and species otherwise distinct from neighbouring river systems to the east (Atlantic coastal drainages), west (Orinoco), and south (Amazonas). It has a unique composition of endemic Guiana Shield taxa that are considered the most primitive sister groups to many fish taxa in South America.

3. Guianas Freshwater Eco-region

This eco-region includes all of the independent rivers running off the northern and eastern slope of the Guiana Shield into the Atlantic Ocean, from the Demerara River (Guyana) to the Oyapock (French Guiana and Brazil). It is limited to the south by the Amazon drainage divide. A recent compilation of species lists more than 420 described fish species distributed in 10 orders and 43 families, of which 169 are considered endemic. The eco-region contains 18 gymnotoid species, all of which have electrogenic or electro-sensory organs; the largest is the electric eel (*Electrophorus electricus*). The eco-region contains sites along the coast that are important habitats for breeding, feeding, and wintering water birds such as the semi-palmated sandpiper (*Calidris pusilla*).

Of the thirty-two families of waterfowls identified, 12 are found along the coast of Guyana. Many of these bird species migrate from the northern, western and eastern United States for the winter season⁵⁹. Shell Beach is the only area in Guyana where four of the world's endangered species of marine turtles - Leatherback (*Dermochelys coriacea*), Green *Chelonia mydas*, Hawksbill (*Eretmochelys imbricata*) and Olive Ridley *Lepidochelys olivacea* come to lay their eggs during March to August every year.

⁵⁹ Bayney, A. The effect of birding on local migrant waterfowl populations along the coast of Guyana. UG Department of Biology. <http://www.mangrovesgy.org/home/images/stories/Documents/Birds%20along%20the%20coast%20of%20Guyana.pdf>.

3. Status, Trends and Threats to Biodiversity

This section provides a succinct overview of the various components of Guyana's biodiversity related to the status, trends and threats based on available evidential information. The status and trends are presented for the ecosystem level for which there is available in-country information as against the taxonomic group or species level where there is little or no available empirical or published information. The section also describes the main direct pressures or drivers of biodiversity loss.

3.1 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.

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 ha⁶⁰. 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 8.

Table 8: Area Deforested 1990 to 2012⁶¹.

Period	Years	Forest Area ('000 ha)	Change ('000 ha)	Change (%)
Initial forest area 1990		18 473.39		
Benchmark (Sept. 2009)	19.75	18 398.48	74.92	0.41
Year 1 (Sept. 2010)	1	18 388.19	10.28	0.056
Year 2 (Oct. 2010 to Dec. 2011)	1.25	18 378.30	9.88	0.054
Year 3 (Jan. 2012 to Dec. 2012)	1	18 487.88	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%/yr⁶². The detection of forest change was made more precise with the use of 5 m resolution satellite imagery for Year 3 as compared to previous years where 30 m resolution was used. Such improvements therefore facilitated increased accuracy in the detection and attribution of the key drivers of deforestation in Guyana.

Figure 9 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.

⁶⁰ GFC, December, 2013. Guyana REDD+ Monitoring Reporting and Verification System (MRVS), Year 3 Interim Measures Report – 01 January 2012 – 31 December 2012, Version 3.

⁶¹ GFC, December, 2013. Guyana REDD+ Monitoring Reporting and Verification System (MRVS), Year 3 Interim Measures Report – 01 January 2012 – 31 December 2012, Version 3.

⁶² GFC, December, 2013. Guyana REDD+ Monitoring Reporting and Verification System (MRVS), Year 3 Interim Measures Report – 01 January 2012 – 31 December 2012, Version 3.

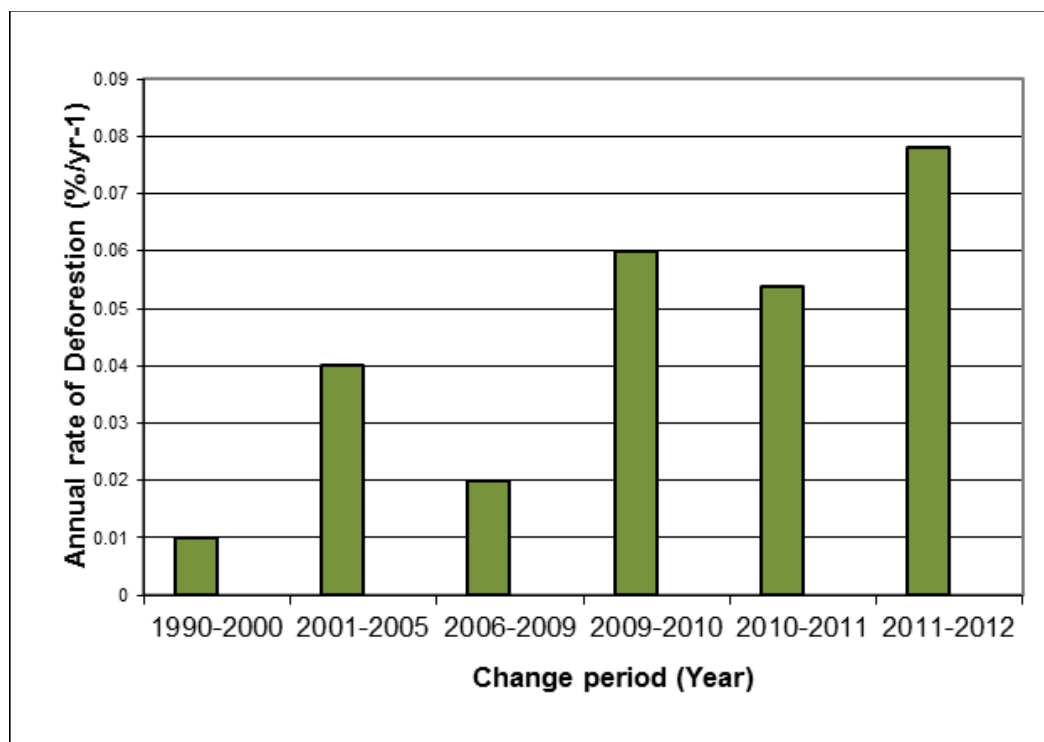


Figure 9: Annual Rate of Deforestation by Period from 1990 to 2012⁶³.

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. A 2006 study on the state of the North Rupununi Wetlands⁶⁴ indicated that the ecological system was performing wetland functions as would have been expected in healthy wetland systems. The findings also 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 study⁶⁵ which identified and characterized 23 wetlands sites within Guyana (Table 9). The study focused specifically on representative freshwater and brackish water areas of open water bodies, permanently flooded vegetated lands, and seasonally flooded lands of marine/coastal wetlands, inland wetlands and human-made wetlands. The results of the study, however, only provided baseline information and preliminary insight into the characteristics of the study sites and did not give insight into the overall status or health of the wetlands studied.

⁶³ GFC, December, 2013. Guyana REDD+ Monitoring Reporting and Verification System (MRVS), Year 3 Interim Measures Report – 01 January 2012 – 31 December 2012, Version 3.

⁶⁴ Darwin Initiative Guyana Partnership, 2006. The state of the North Rupununi Wetlands.

⁶⁵ WWF-Guianas Wetlands of Guyana study, 2012.

Table 9: Wetlands Sites in Guyana Studied by WWF-Guianas in 2012.

Lake Mainstay, Essequibo Coast	Assakata Lake and wetlands, North West District
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 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 vegetation⁶⁶.

The total area covered by coastal zone forest/mangrove forests in Guyana has declined over the past twenty-five years. A recent study⁶⁷ 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 ac). 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 10 shows the map of the coastal forest zone.

⁶⁶ Berry, P. E. Huber, O. and B. K. Holst, (1995). Floristic analysis and phytogeography', pp. 161-191 in P.E. Berry, B.K. Holst and K. Yatskiyevych (eds.), Flora of Venezuelan Guyana, Volume 1, Introduction. Missouri Botanical Garden, St. Louis, USA.

⁶⁷ Report on the Mapping and Inventory of Coastal Zone Forest in Guyana, South America, August 31, 2011. Prepared by Persaud, H. on behalf of the Guyana Mangrove Restoration Project.

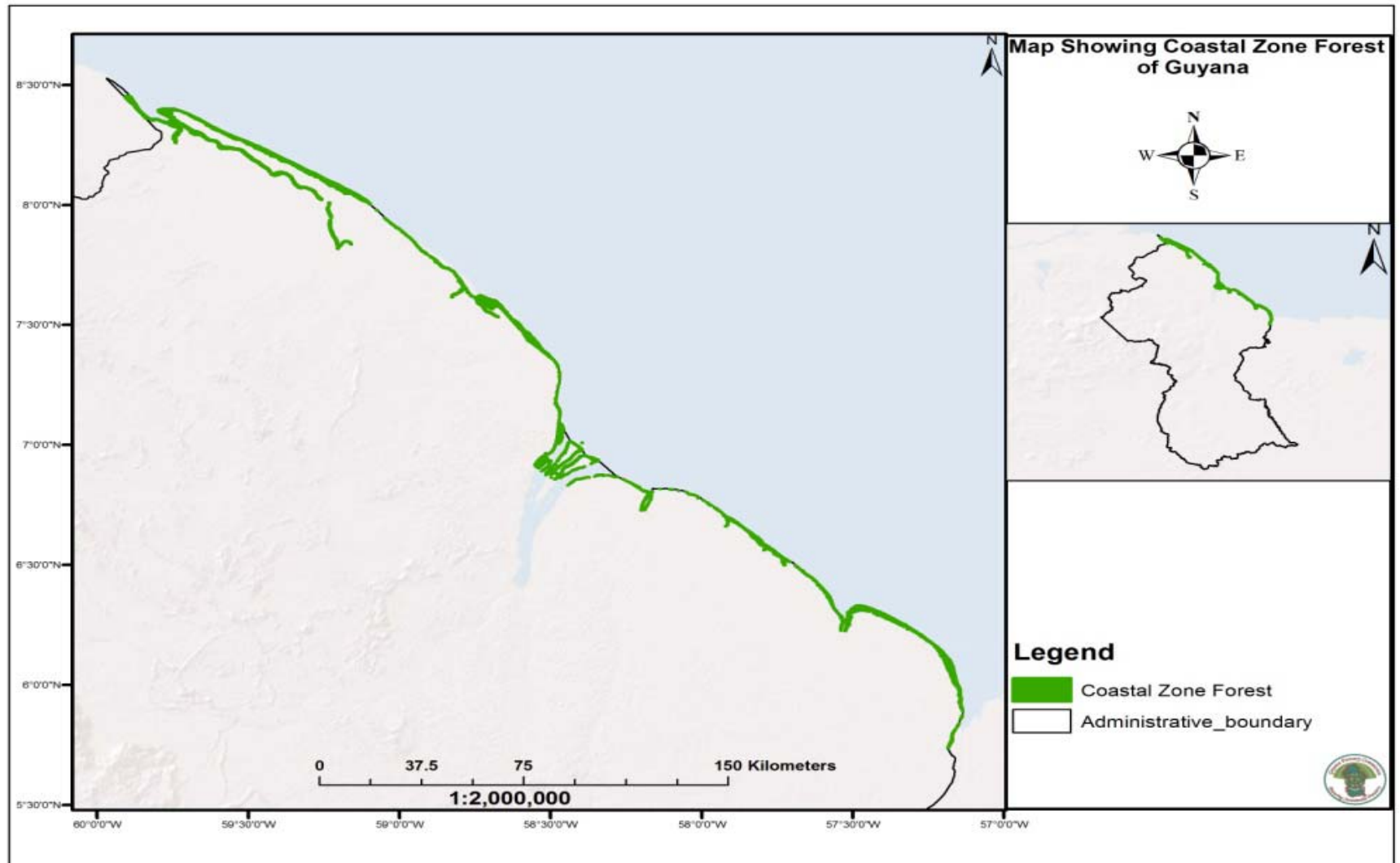


Figure 10 : Map showing coastal zone forest of Guyana.

Guyana's marine ecosystem and by extension the marine ecosystems of the Guianas are 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 contains⁶⁸. Additionally, many river plumes, including that of the Amazon River and other major rivers, and the Corentyne and Essequibo Rivers, enrich the marine habitats along the coast of the Guianas with nutrients.

Protected Areas and Priority for Conservation

Guyana has made steady progress in conservation and protected areas development. Approximately 5.6% of the country's land area is legally protected in the national protected areas system⁶⁹. These include the Kanuku Mountains and Shell Beach Protected Areas which were recently established legally as Protected Areas, along with the Kaieteur National Park, the Iwokrama International Centre for Rainforest Conservation and Development and the community-owned conservation area at Konashen. 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.

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.

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 species⁷⁰.

3.2 Main Threats

Climate change, land degradation and deforestation 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.

⁶⁸ World Wildlife Fund (WWF) - Guianas, 2012. Wetlands of Guyana – An insight into the ecology of selected wetlands with recommendations from WWF-Guianas.

⁶⁹ Protected Areas Commission, June 2013. Protected Areas System Plan, 2013-2015.

⁷⁰ Guyana's 2nd National Report to the FAO on PGRFA, 2012.

Climate Change

According to the Second National Communication (SNC) to the UNFCCC, Guyana is particularly vulnerable to climate change impacts due to its extensive low-lying coastal zone where over 90% of the population resides and where the main livelihoods, economic activities and infrastructure are found. This zone is threatened by sea-level rise, increase in storm surges, and changes in rainfall patterns. Any impact on the coastlands will have consequences for the country's economy sustained by agriculture, forestry, and fishing - economic activities that are highly sensitive to changes in climate.

Projected climate change scenarios, for the twenty-first century that cover precipitation and temperature changes, sea-level rise and storm surge on the coastal zone, were examined in the SNC. According to the results, Guyana will experience increases in temperature, increased rainfall in the rainy season, and less precipitation in months where there are already water deficits. The rainfall patterns would experience considerable temporal and spatial change over the country. Overall, however, the climate projections indicate that mean annual precipitation could decrease. These projections align with the most recent findings of the Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment Report (AR5) that project precipitation decreases for Guyana. It is projected that the low-lying coastal plains will be under the foremost threat of sea-level rise. The projections show that by 2031, the increase in sea-level could reach 26 cm, and for 2071, it could be up to 51 cm. In addition, by 2031, storm surges could result in a 2.94 cm sea-level rise (in a moderate scenario), and up to 5.94 cm (in a catastrophic scenario). These changes could translate into ecosystems disruptions, floods, landslides, storm surges and droughts, among other impacts.

Figure 11 graphically shows the extension of different lands that would be inundated for 2051 under the scenarios sea-level rise, minimum and maximum storm surges according to the CGCM2⁷¹ model. Figure 12 shows the worst case scenario analyzed by 2051, where more than 142,000 ha would be inundated out of which 29,443 ha would be rice cultivated land; 28,032 sugar cane, and 22,361 residential land.

⁷¹ Coupled General Circulation Model (CGCM) for Climate Simulations – For more details, See Guyana's Second National Communication to the UNFCCC, Ministry of Agriculture.

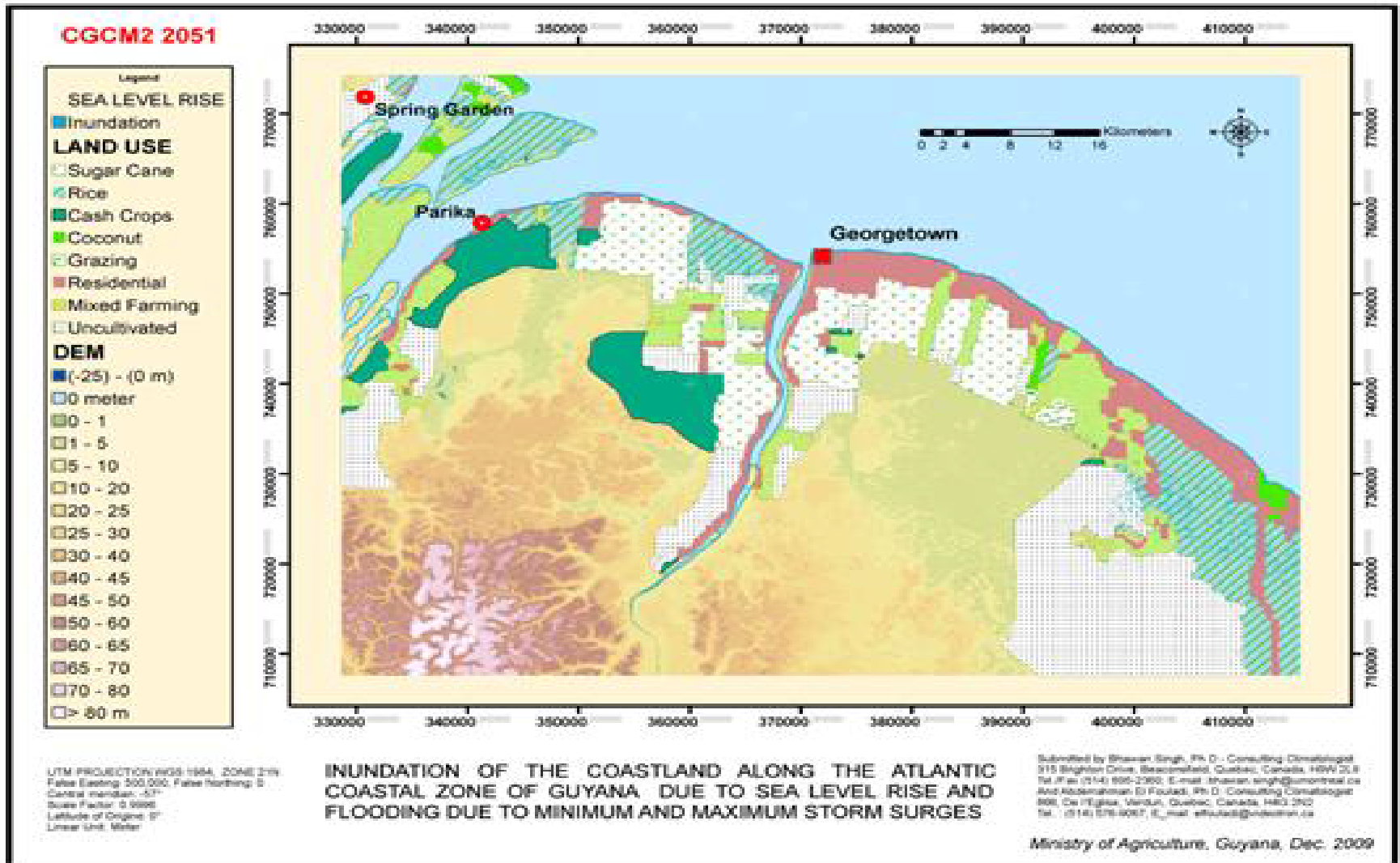


Figure 11: Inundation due to sea level rise, minimum and maximum storm surges according to the CGCM2 model for the year 2051 for the selected study area on the coastal zone of Guyana.

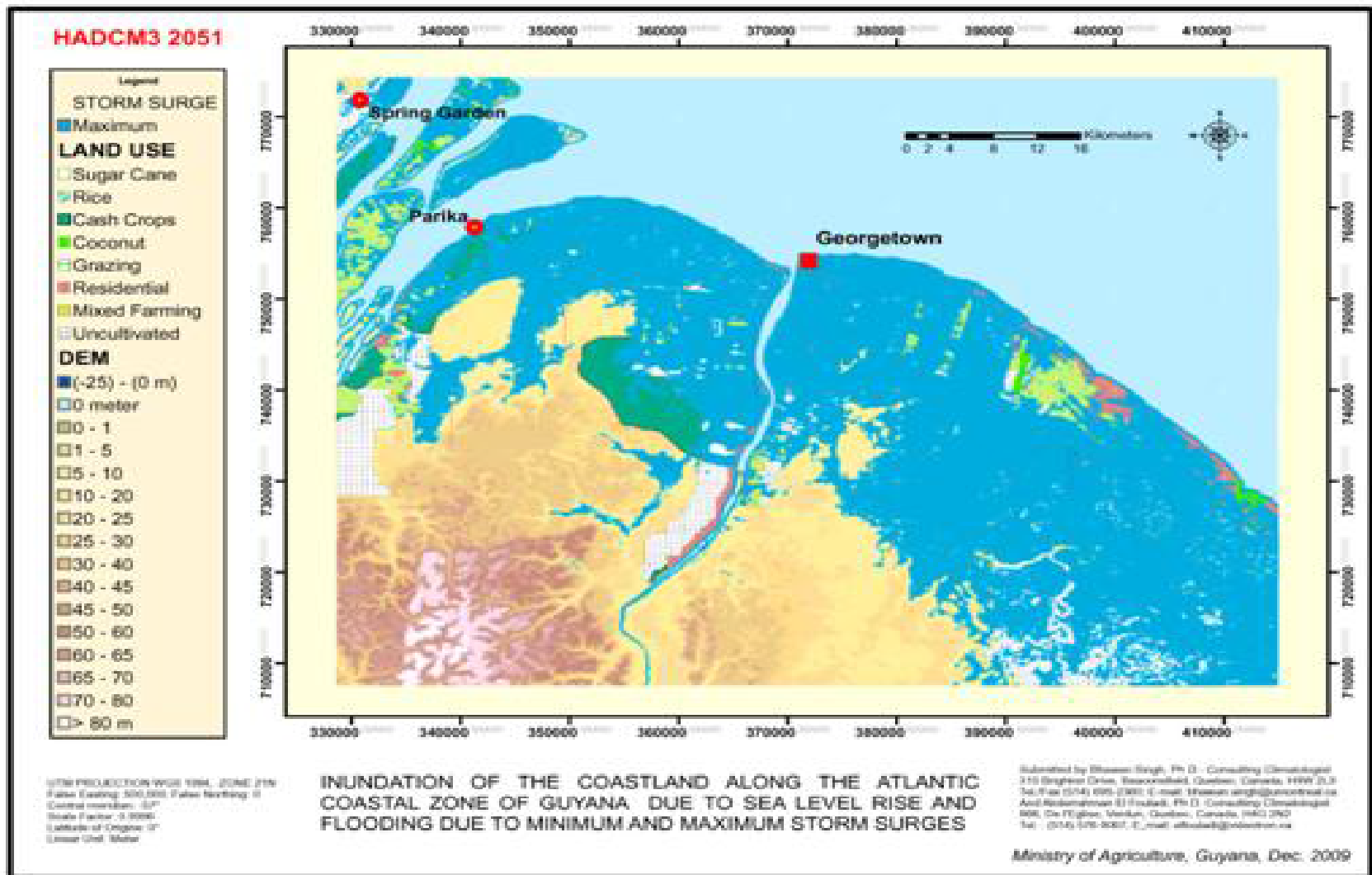


Figure 12: Inundation due to minimum and maximum storm surges (5 m) and sea level rise according to the HadCM3 for the year 2051 for the selected study area on the coastal zone of Guyana.

Increasing threat of land degradation

Land degradation adversely affects the productive, physiological, cultural and ecological functions of land resources, such as soils, water, plants and animals⁷². The inability of severely degraded land to provide ecosystem functions and services leads to a loss of environmental, social, economic and non-material benefits that are critical for society and development⁷³. Furthermore, given that ecosystems provide the essential services required by humans such as water, food, fuel, climate regulation, disease control⁴¹, etc., land degradation leads to socioeconomic problems such as food insecurity, poverty and limited development, land use conflicts and migration, damage to basic resources and ecosystems, and loss of biodiversity through changes to habitats at both species and genetic levels⁷⁴.

There are some areas across Guyana that are potentially vulnerable to land degradation (Figures 13 & 14). The 2008 land degradation assessment⁷⁵ revealed the following:

1. 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.
2. Land degradation has not received national attention and as such, the extent to which this event is occurring has not been measured. 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.
3. The nature-base 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 13).

⁷² Sherman, K. and G. Hempel, 2008. The UNEP Large Marine Ecosystem Report: A perspective on changing conditions in LMEs of the world's regional seas. UNEP Regional Seas Report and Studies No. 182. United Nations Environment Programme. Nairobi, Kenya.

⁷³ FAO, 2008.

⁷⁴ LADA Secretariat, 2008. Sherman, K. and G. Hempel, 2008. The UNEP Large Marine Ecosystem Report: A perspective on changing conditions in LMEs of the world's regional seas. UNEP Regional Seas Report and Studies No. 182. United Nations Environment Programme. Nairobi, Kenya.

⁷⁵ National Assessment of Land Degradation in Guyana - Diagnostic Report - Lands and Surveys Commission, United Nations Development Programme & Global Environment Facility, 2008.

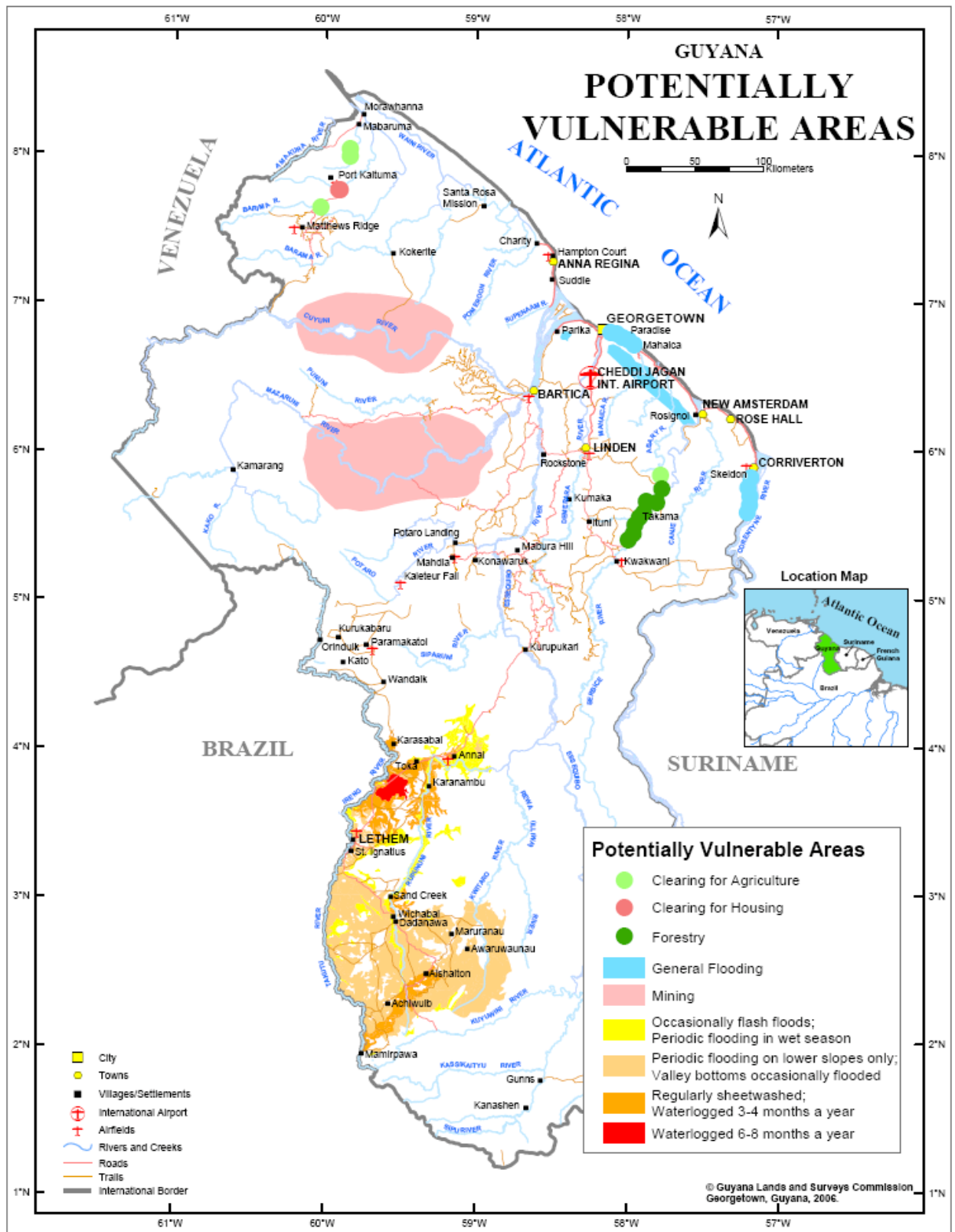


Figure 133: Potentially Vulnerable Areas⁷⁶.

⁷⁶ National Assessment of Land Degradation in Guyana - Diagnostic Report - Lands and Surveys Commission, United Nations Development Programme & Global Environment Facility, 2008.

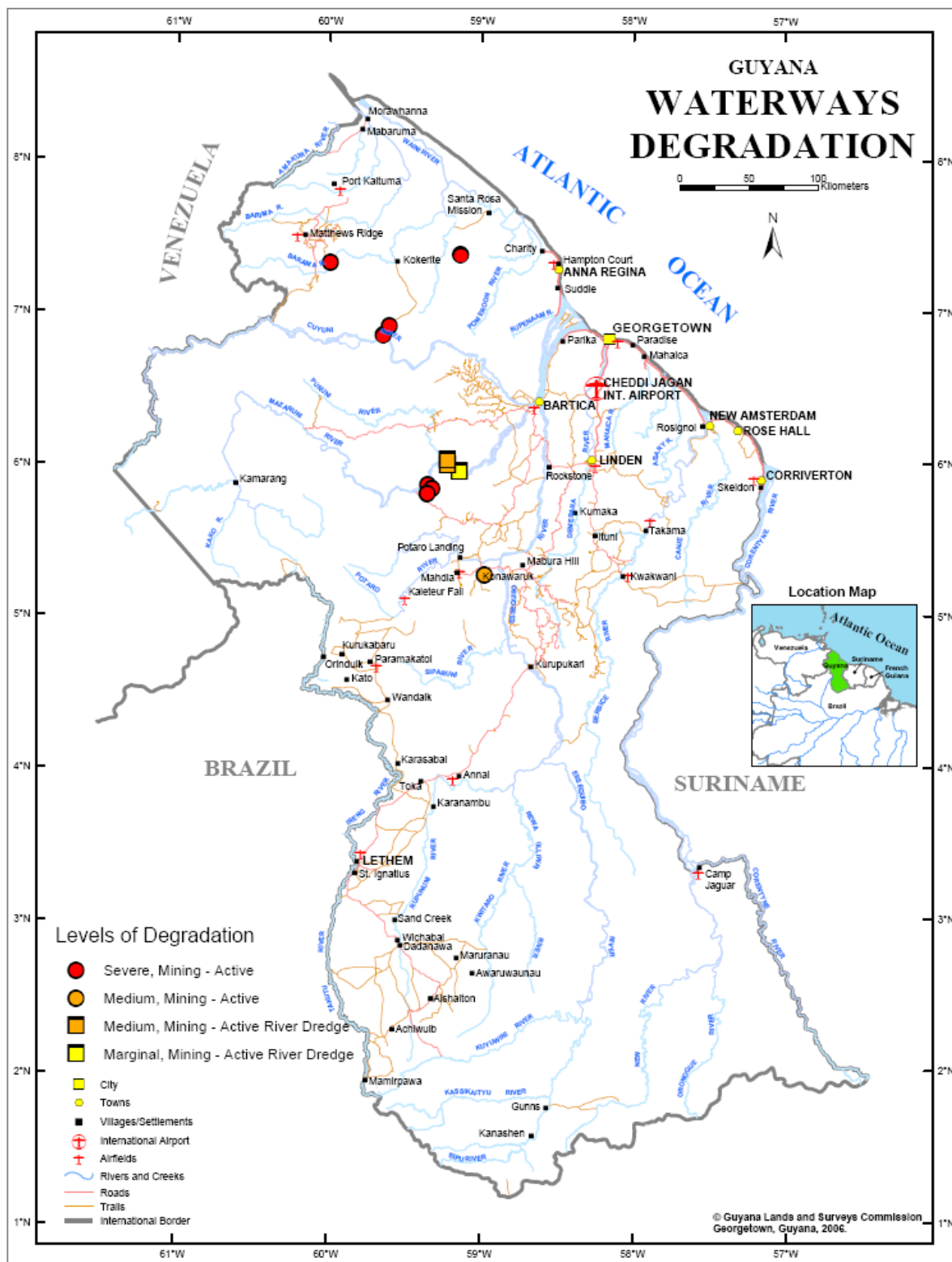


Figure 144: Water Degradation in land units where Mining and Forestry Overlap⁷⁷.

⁷⁷ National Assessment of Land Degradation in Guyana - Diagnostic Report - Lands and Surveys Commission, United Nations Development Programme & Global Environment Facility, 2008.

Deforestation

Asner *et al* (2006)⁷⁸ showed that there is significant connection between the presence of roads, selective logging practices and deforestation in the Brazilian Amazon, though little is known about the impacts of infrastructure on tropical forest biodiversity⁷⁹. Benítez-López *et al* (2010)⁸⁰ studied the effects of infrastructure proximity on mammal and bird populations worldwide. The study showed that mammal and bird population densities declined with their proximity to infrastructure. Another impact of infrastructure on mammals and birds was that the animals tended to avoid infrastructure in open areas over longer distances than in forested areas.

Deforestation rates within Guyana 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:

- 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 10 shows Forest Change Area for Guyana by Period and Driver from 1990 to 2012.

⁷⁸ Asner, G. P., Broadbent, E. N., Oliveira, P. J. C., Keller, M., Knapp, D. E., and J. N. M. Silva, (2006). Condition and fate of logged forests in the Brazilian Amazon. PNAS 103: 12947-12950.

⁷⁹ WWF-Guianas Living Guianas Report, 2012.

⁸⁰ Benítez-López, A., Alkemade, R., and P. A. Verweij, (2009). The impacts of roads and other infrastructure on mammal and bird populations: A meta-analysis. Biological Conservation 143: 1307–1316.

Table 10: Forest Change Area by Period and Driver from 1990 to 2012⁸¹.

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.

⁸¹ 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 15. 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.

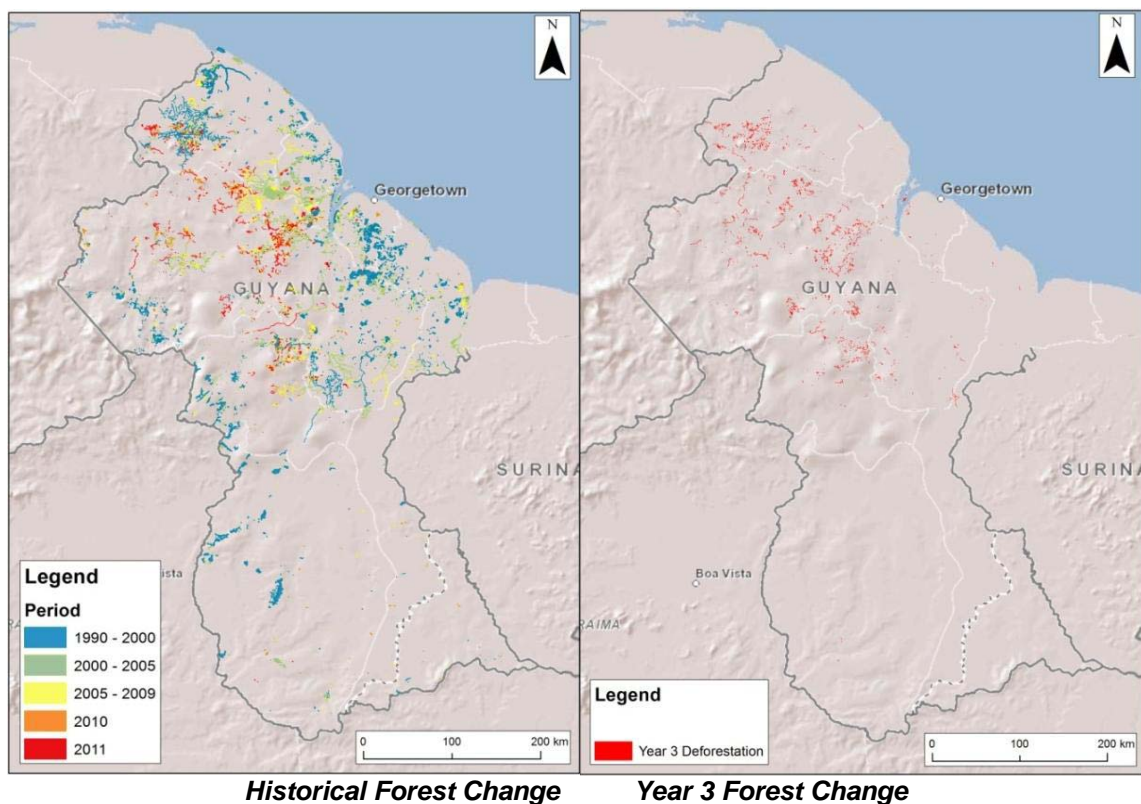


Figure 155: Historical and Year 3 Forest Change⁸².

Key Emerging Threats/ Pressure

The following are key emerging threats and pressures:

- A threat to the fishing industry is beginning to emerge. A decline in fish catch of 6.5% in 2013 was attributed to overfishing⁸³. Several other reasons are mentioned for this, including high exploitation costs due to high fuel prices, inadequate management of fish resources, and fish stock decline throughout the Guiana region⁸⁴. According to WWF-Guianas Living Guianas Report, 2012, Guyana's marine shrimp fisheries are accepted as being overexploited, especially the prawn fisheries, and there is concern that the sea bob (a smaller shrimp) and sharks are also showing signs of over-exploitation.
- The mangrove belt has been severely depleted apparently from heavy damage by human use, rise in sea level, and increased wave force⁸⁵. The fringe of natural mangrove along the coast has been reduced to tens of meters wide or zero for some places⁸⁶.

⁸² GFC, December, 2013. Guyana REDD+ Monitoring Reporting and Verification System (MRVS), Year 3 Interim Measures Report – 01 January 2012 – 31 December 2012, Version 3.

⁸³ National Budget, 2014.

⁸⁴ WWF-Guianas Living Guianas Report, 2012.

⁸⁵ National Mangrove Restoration Project. www.mangrovesgy.org/home/index.php/2014-04-27-16-39-08/conservation-status-of-

- Despite the declining prices on the world market, gold mining continues to increase and significant extraction of gold is expected with significant expansion by small-scale operators and 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, and removal of trees and soil. Mining has been identified as the single largest driver of deforestation with up to 0.06% of annual forest loss⁸⁷. According to the WWF-Guianas Living Guianas Report, 2012, the most degraded forest areas in Guyana are found in the North-West region of the country, which is known to have the highest concentration of mining concessions. This area coincides with timber concessions, meaning that forestry will have provided infrastructure for mining.
- Development pressures in the interior and forested areas of Guyana, facilitated by improved infrastructure (roads, trails, and airstrips) and expansion in extractive industries (mining and forestry), along with agriculture, wildlife trade and hunting, all stand to place increased threats to biodiversity.
- Anecdotal evidence suggests overfishing and overhunting on commercial scales are beginning to emerge as a significant threat to biodiversity, primarily as a result of a growing demand for wild meat. Sport fishing and hunting has been reported to be on the increase in unspoiled and less-developed areas such as the Rupununi area and the intermediate savannahs of Guyana.
- 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 reefs. With the recent global exposure as a tourist destination and the increasing visitor arrivals, 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.

Notwithstanding these threats, Section II provides a comprehensive overview of initiatives completed and on-going as part of the implementation of the national strategy and the mainstreaming of biodiversity.

mangroves.

⁸⁶ 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/>.

⁸⁷ GFC and Poyry, 2011. Interim measures Report, Guyana REDD+ Monitoring, Reporting and Verification System (MRVS).

SECTION II: IMPLEMENTATION OF THE NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN (NBSAP) AND MAINSTREAMING OF BIODIVERSITY

4. NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN

4.1 Brief Background and Overview of NBSAP

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*”. In 2004, the Environmental Protection Agency (EPA), with assistance from the United Nations Development Programme (UNDP), conducted a review of the NBAP to identify achievements and setbacks and plan for a second action plan.

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. Further, in an effort to more effectively coordinate activities for NBAP II implementation, the EPA's Strategic Plan (2006-2010) addressed the provision of adequate institutional structure, human and financial resources for this purpose. Additionally, the National Strategy and Action Plan (2007-2011) for Synergistic Environmental Capacity Development for Biodiversity, Climate Change and Land Degradation, outlined approaches to facilitate efficient implementation of NBAP II.

The EPA, with support from the GEF, through the United Nations Environment Programme (UNEP), has recently revised and updated the NBAP II to the National Biodiversity Strategy and Action Plan (NBSAP) (2012-2020), which has included a strategy for implementation, as well as agreed national targets agreed upon through national and sub-national consultations. This document, which is now referred to as the National Biodiversity 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, 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 goals while meeting at the same time, its obligations to the UNCBD. In this regard, it incorporates the objectives of Guyana's LCDS and the Aichi 2011-2020 Targets.

4.2 Revising and Updating of NBAP II to NBSAP to align with the Strategic Plan for Biodiversity 2012-2020 and Aichi Targets

A revised National Biodiversity Strategy and Action Plan (NBSAP) (2012-2020) was completed during 2014. The revision 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 NGOs and the private sector. Extensive use was made of the guidelines, manuals and other recommended resources for the preparation of NBSAPs.

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. An assessment of stakeholders' knowledge and use of the previous NBAP (2007-2011) as well as the extent of biodiversity mainstreaming activities was also done.

The revised and updated NBSAP (2012 -2020) reflects Guyana's low carbon development thrust, mainstreaming of biodiversity in priority sectors such as agriculture, mining and ecotourism, and *in situ* and *ex situ* conservation of biodiversity. It recognizes the need for better quality of information to assess status, threats and trends in biodiversity and emphasizes the need for communication, resource and capacity building strategies to ensure effective natural resources planning and management. The revised/updated NBSAP (2012-2020) places emphasis on monitoring and evaluation and better implementation of the conventions and protocols and includes the vision for biodiversity which is “ *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”.

Nine strategic objectives have been identified with 47 actions to be implemented by 2020, contributing to the five goals of the Strategic Plan and 12 of the 20 AICHI targets (Table 12). The strategic objectives (SO) are as 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.

4.3 NBSAP and Mainstreaming

Mainstreaming biodiversity has no single agreed-upon definition. Mainstreaming means integrating or including actions related to conservation and sustainable use of biodiversity in strategies relating to production sectors, such as agriculture, fisheries, forestry, tourism and mining. Mainstreaming might also refer to including biodiversity considerations in poverty reduction plans and national sustainable development plans⁸⁸. Mainstreaming of biodiversity can take place in different settings. It can focus on production landscapes, particularly those where natural resource-based industries such as agriculture, forestry and wildlife are active. It can also be focused on enabling environments at local, national or global levels and including development policy, legislation, land-use planning, finance, taxation, economic incentives, international trade, capacity building, research, and technology. Mainstreaming can be pursued by conservation NGOs, industries, governments or even communities. In Guyana, biodiversity is being mainstreamed at various levels and by different stakeholders.

Box 5: CBD Mainstreaming Mandate

According to **Article 6b of the Convention**, Parties have an obligation to: “Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies”.

In addition, COP V endorsed the **Ecosystem Approach**, which provides for the integrated management of land, water and living resources and promotes a balance in the achievement of the three objectives of the Convention, as the primary framework for action under the Convention.

⁸⁸ Mainstreaming Biodiversity Conservation. A Framing Paper for the Scientific and Technical Advisory Panel of the Global Environment Facility. V. 13. Kent M. H. Redford Archipelago Consulting.

The revised/updated NBSAP (2012-2020) implementation is ongoing and mainstreaming of biodiversity in accordance with this strategy and action plan will continue. Several initiatives were implemented since the preparation of the Fourth National Report, and in accordance with NBAP II have contributed to the mainstreaming of biodiversity considerations into key areas including policies, legislation, planning and development.

4.3.1 National Policies, Strategies and Legislation

Guyana developed a number of national policies, strategies and legislation related to biodiversity conservation and management, mostly within the framework of natural resources management and environmental protection. All these aimed towards conservation and management of Guyana's natural resources, inclusive of sustainable utilization of its components.

4.3.1.1 Strategies

Guyana's development framework for sustainable development and integrated planning and decision making, environmental and natural resources management has been strengthened since the Rio Summit (1992) with the incorporation of measures to facilitate this in the national development frameworks which include:

1. National Development Strategy (2001-2010⁸⁹).
2. Low Carbon Development Strategy (2013).
3. National Competitiveness Strategy (2006).
4. Guyana Poverty Reduction Strategy Paper (2011–2015).
5. National Strategy for the Conservation and Sustainable Use of Guyana's Biodiversity (1997).
6. National Protected Areas Strategy (2002).
7. National Strategy for Agriculture in Guyana (2013-2020).

Low Carbon Development Strategy

Importantly, since the preparation of the Fourth National Report, Guyana has been pursuing a low carbon development path with the preparation and implementation of the LCDS. Guyana's LCDS was prepared in 2009 and has since been revised in 2010 and updated in 2013.

The LCDS presents Guyana's vision and plan for the country's forest to be protected and maintained in an effort to reduce global carbon emissions while at the same time attracting resources for development that would put Guyana onto a low carbon growth path. The LCDS has three main components: (i) investment in low carbon economic infrastructure; (ii) investment and employment in low carbon economic sectors; and, (iii) investment in communities and human capital. It provides the framework to transform Guyana's current economy to that of a "low carbon economy" while addressing issues related to climate change. The LCDS is currently in its implementation phase and is being coordinated by the Office of the President through the Office of Climate Change and overseen by a Multi-Stakeholder Steering Committee (MSSC). The LCDS is being supported through a partnership between GoG and the Kingdom of Norway whereby Norway has committed to provide financing to support Guyana's avoided deforestation efforts and the building of a working model of REDD+. Monies received under this initiative are being managed under the Guyana REDD-Plus Investment Fund (GRIF). The GRIF aims to align national economic development with climate resilience and low-deforestation, low carbon growth by investing in low-carbon strategies identified in the LCDS. The Government has outlined how it aims to utilize this fund. Priority investments identified will be in:

- Amaila Falls (hydropower) equity;
- Amerindian Development Fund;
- Amerindian Land Titling;
- Institutional Strengthening of key institutions in natural resources management;

⁸⁹ While the duration is from 2001 to 2010, currently it is still considered to be in use.

- Medium and Small Enterprises and vulnerable groups sustainable livelihoods;
- An International Centre for Biodiversity Research; and
- Adaptation Projects and other support for the LCDS⁹⁰.

Under the LCDS, a national system to monitor [measure], report and verify (MRVS) emissions or removals of carbon from the forest sector was developed by the Guyana Forestry Commission (GFC) and is currently being implemented. The MRVS provides the basis for reporting in accordance with the principles and procedures agreed to by GoG in relation to reducing emissions from deforestation and forest degradation.

In addition to the MRVS, there are other forest governance initiatives being pursued under the LCDS which are intended to improve sustainability and enforcement of standards to prevent environmental degradation and excessive forest loss and species therein. Some of these measures include the country's commitment to the Extractive Industry Transparency Initiative, the European Union Forest Law Enforcement, Governance and Trade (EU-FLEGT) programme, Independent Forest Monitoring and preparation of a National Land Use Plan (NLUP). Other measures include institutional strengthening and capacity building of regulatory agencies in the natural resources sector. Measures are also being implemented to better track illegal activities and deforestation through improved information sharing across the natural resources management agencies, such as the newly established Geospatial Information Management Unit within the Ministry of Natural Resources and the Environment.

The LCDS also outlined how Guyana intends to ensure that at least 10% of the country land area would be under some form of protection. Activities have progressed in this area, including the enactment of the Protected Areas Act and the establishment of the Protected Areas Commission. Guyana's policy objective in this area 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.

This is in keeping with the NPAS objectives which includes preservation of all natural ecosystems, protection of areas of particular biological significance, contribute to mitigating against the effects of climate change and natural hazards, maintaining of cultural heritage, providing opportunities for education and training, contribution to sustainable economic development, employment opportunities for remote communities through conservation services, etc. Some of the recent activities to move this process forward include establishing of the PAC and two new protected areas (2011); the establishing of the National Protected Areas Trust Fund; developing a strategic plan for the PAC; development of a systems plan for the protected areas system (2013-2015); management plans for individual protected areas; and, establishing a field presence in these protected areas.

National Strategy for Agriculture

In addition to the LCDS, a National Strategy for Agriculture in Guyana (2013-2020) was developed. The Strategy outlines a roadmap to ensure that Guyana achieves its ambitions as a food and nutrition secure nation and as a major contributor to food and nutrition security within the Caribbean Region. 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. The Strategy focuses on a wide range of activities including environmental sustainability, plant and animal health, agro-diversity, land availability, agro-energy and efficient infrastructure. Among the 25 priority areas identified for implementation are several that promote conservation and sustainable use of biodiversity. These are outlined below.

- Safeguarding plant genetic resources. In this regard, the Ministry will seek genetic stocks and varieties that improve quality and yield for crops, fish and livestock and demonstrate resilience to climate change.

⁹⁰ Low Carbon Development Strategy. <http://www.lcds.gov.gy>.

- Promoting the growth of specialty fish.
- Establishing soil health as a major priority in the development of a modern and effective agricultural sector, assuring food security, economic benefits and environmental protection. Soil health will be promoted through the prudent utilization of biological, chemical and physical methods in an ecosystem agronomic approach. The escalating demand for agricultural products, particularly food, increasing land degradation because of unsustainable practices and the need to improve yield, demand that soil health is maintained.
- A strategy for the management and development of the Fisheries Sector 2012-2020.
- Improving marine fishing (deep-water, trawl and artisanal fishing) in a sustainable environment to support export of fish products.
- Promoting farmed-based fishing (aquaculture) and inland fisheries as a significant part of diversification and as a critical component for wealth generation.
- Exploring and promoting the emerging area of sports fishing utilizing the catch and release method. This would provide an opportunity for world anglers to sport-fish for some of the world's most exotic fresh water species.
- The Vision for Agriculture 2020 recognizes Guyana's lead role in the advocacy and in implementation of programmes for global solidarity to stop climate change and its adverse effects. Guyana will develop its own RIO+20 Agricultural Environmental Agenda and will lead by example.
- Mapping where agricultural land exists and how much will be needed to supply future demand for food, fiber, and fuel production, and for the maintenance of ecosystems in changing economic, environmental and demographic circumstances.

4.3.1.2 Policies

Guyana developed a number of policies related to biodiversity conservation and management, mostly within the framework of natural resources management. These policies all aim towards conservation and management of Guyana's natural resources, inclusive of sustainable utilization of its components, and include:

- National Forest Policy (2011);
- Policy on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilization (2007);
- Biotechnology, Biosafety and Biosecurity Policy (2007);
- National Integrated Water Resources Management Policy and Roadmap (2013);
- Guyana Power Sector Policy and Implementation Strategy (2010 – 2014);
- Sea and River Defence Policy (2009);
- National Policy on Inland Fisheries and Aquaculture (2012); and
- National Land Use Policy (prepared in Draft).

National Forest Policy

Since the Fourth National Report, Guyana has revised the National Forest Policy (NFP) in 2011, which aims to ensure the *“conservation, protection, management and utilization of the nation's forest resources while ensuring that the productive capacity of the forests for both goods and services is maintained or enhanced⁹¹”*. The revised NFP addresses the country's national and global responsibility for the sustainable management of the forest and recognizes the critical role of forests in maintaining the ecosystems and life supporting services.

Draft National Land Use Policy

The draft National Land Use Policy, which was prepared in 2004, was revised in 2007 and 2012. The policy aims to streamline land use planning and to create conditions necessary to achieve types of land

⁹¹ Guyana Forestry Commission, 2011. National Forest Policy.

uses which are sustainable, socially desirable and environmentally compatible on state lands and provides the framework for coordination among land uses. It will also facilitate integration of land use and the preparation of a NLUP. The revision of the policy in 2012 incorporated the principles of sustainable land management.

ABS Policy

A national policy addressing Access and Benefit Sharing (ABS) has been finalized and endorsed by the GoG in 2007. The policy addresses ABS in the context of Guyana and the UNCBD and defines the mandates and the responsibilities of the national agencies directly involved in the implementation of the policy. Implementation of the ABS policy follows a draft ABS Regulations that addresses prior informed consent, sharing of benefits, genetic resources among other aspects. These draft regulations are currently being revised to incorporate the requirements of the Nagoya Protocol, which Guyana has recently acceded to.

National Biosafety Framework

A National Biosafety Framework for Guyana was also developed and endorsed by Cabinet and is currently in the implementation phase. As part of the National Biosafety Framework, a draft policy on biotechnology, biosafety and biosecurity has been prepared in accordance with Guyana's obligations under the Cartagena Protocol. The policy aims to control and monitor Genetically Modified Organisms (GMO) and Living Modified Organisms (LMO) while preventing adverse effects on the conservation and sustainable use of biological diversity in Guyana. In addition to GMOs and LMOs, the policy also targets all elements of genetic materials used in genetic manipulation, as well as, laboratory and field applications of biotechnology within Guyana. Consultations were recently held on the draft policy and the feedback from these consultations is currently being addressed.

Power Sector Policy and Implementation Strategy

A Power Sector Policy and Implementation Strategy was prepared in 2010 and outlines the power sector initiatives to be implemented by the Guyana Government for the medium term (2010-2014), and in some areas, a long-term (15 year) perspective is given. The policy recommends measures to reduce the country's dependence on imported fossil fuels, such as exploring hydro, wind, solar and biofuels as possible alternatives. Projects under the Clean Development Mechanism (CDM) that was created by UNFCCC in 1997 to assist developing countries to address their Sustainable Development needs were also recommended.

National Integrated Water Resources Management Policy

A National Integrated Water Resources Management Policy and Roadmap was also prepared in 2013 to ensure water resources are managed in a manner to safeguard the health, safety and welfare of Guyana's citizens and ecosystems and to ensure effective, efficient, and equitable use of water resources consistent with the sustainable development goals of the nation. This policy sets out the framework for the management of Guyana's water resources and presents a road map for the planning for integrated water resources management, which includes maintaining the integrity of the aquatic ecosystems.

National Policy on Inland Fisheries and Aquaculture

The National Policy on Inland Fisheries and Aquaculture was developed in 2012 and was guided by the Caribbean Community Common Fisheries Policy (2011). The policy aims at promoting the sustainable development of inland fisheries and aquaculture to ensure food security and social and economic benefits while protecting, maintaining and rehabilitating the ecosystem. The policy also focuses on institutional strengthening, capacity building and research and development.

Sea and River Defence Policy

Guyana has developed a Sea and River Defence Policy⁹², which calls for alternative solutions to traditional sea defence structures and includes the re-establishment of mangroves for flood protection and safeguarding environmental resources. An initiative to restore and plant new mangrove forests has contributed to carbon sequestration, adaptation to climate change through the strengthening of natural sea defences, protection of coastal zone biodiversity and job creation. Resulting from this initiative were:

- a mangrove inventory of the entire coastline;
- a newly established mangrove ranger unit comprising 8 rangers, monitoring some 36.5 km of mangroves;
- a mangrove monitoring plan and mangrove monitoring protocols;
- restoration of five (5) km of mangroves along the coast;
- a code of practice for mangrove harvesting;
- a Mangrove Visitor Centre hosting 3 000 students per year and 200 visitors per month;
- on the policy and regulatory side, mangrove protection is now considered in the National Forest Act; and
- a Mangrove Action Plan was approved by Cabinet in 2010.

4.3.1.3 Plans

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

- National Environmental Action Plan (2001-2005).
- National Biodiversity Action Plan II (2007-2011).
- National Forest Plan (2011).
- National Protected Areas System Plan (2013-2015).
- National Land Use Plan (2013).
- National Mangrove Management Action Plan (2010).
- Integrated Coastal Zone Management Action Plan (2000).
- Fisheries Management and Development Plan (2006).
- Marine Fisheries Management Plan (2013-2020).

National Forest Plan

In 2010, the National Forest Plan was revised through a national consultative process. This revised plan provides the framework for improving the management of Guyana's forestry sector and compliance with national legislation governing the sector. Moreover, the plan has been aligned with the National Forest Policy, and national development plans such as the LCDS and the REDD+ framework.

National Protected Areas System Plan

The NPAS Plan was prepared in 2013 covering the period 2013 to 2015 and is built on the need to allow for the protection and maintenance of Guyana's unique natural and cultural heritage, whilst at the same time facilitating sustainable social, environmental and economic development. The plan reflects the goal and objectives of the NPAS and was prepared in accordance with the Protected Areas Act, 2011. Several initiatives to enhance the protected areas system are included in the plan such as to adequately maintain and manage existing protected areas, expand on the national protected areas, monitoring of protected areas, enhancing of public awareness and participation, etc. This plan is to be updated as is necessary.

⁹² 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 Land Use Plan

The NLUP was developed in 2013 and provides support to decision making through looking at development options and constraints throughout the country. It was compiled by assessing current land use, potential, constraints and stakeholders' concerns. It provides a strategic framework to guide land development in Guyana. As such, the NLUP is built upon a number of national policies and strategies that have a direct relevance for land use and land management. The NLUP seeks to enable financial resources to be targeted at optimal land uses at the regional level and to provide a spatial element to development planning.

National Mangrove Management Action Plan

A new National Mangrove Management Action Plan was developed in 2010, replacing the Action Plan of 2001. The Action Plan provides a framework to guide stakeholders involved in the utilization and protection of mangrove resources and its primary objective is to foster a coordinated approach to policy formulation, planning, institutional cooperation and implementation of actions and activities for mangrove management. Its primary objective is to respond to climate change and to mitigate its effects through protection, rehabilitation and wise use of the country's mangrove ecosystems through processes which maintain their protective function, values and biodiversity while meeting the socioeconomic developmental and environmental protection needs in estuarine and coastal areas. Most of the coastal areas of Guyana are covered in mangrove vegetation.

Marine Fisheries Management Plan

The Marine Fisheries Management Plan provides a 7-year management plan for marine fisheries in Guyana, from 2013 to 2020 and updates the previous management plan, which covered the period 2007 to 2011. The key fisheries outlined in the plan are artisanal fishery, industrial sea bob and prawn fishery, semi-industrial red snapper fishery and shark fishery. Within the document, detailed management measures are outlined for each fishery including long- and short-term objectives, including measures to protect and conserve marine species.

4.3.1.4 Legislation

Several pieces of legislation were developed to ensure protection of the country's environment and sustainable use and conservation of the natural resources, including:

- Environmental Protection Act, 1996.
- Environmental Protection Regulations, 2000
 - The Environmental Protection Authorization Regulations;
 - The Environmental Protection Air Quality Regulations;
 - The Environmental Protection Water Quality Regulations;
 - The Environmental Protection Hazardous Waste Management Regulations; and
 - The Environmental Protection Noise Management Regulations.
- Litter Enforcement Regulations, 2014.
- Wildlife Management and Conservation Regulations, 2013.
- Species Protection Regulations, 1999.
- Protected Areas Act, 2011.
- Forest Act, 2009.
- Fisheries Act, 2002.
- Mining Environmental Regulations, 2005.
- Kaieteur National Park Act, 1929.
- Iwokrama International Centre of Rainforest Conservation and Development Act, 1996.
- Wild Birds Protection Act, 1990.
- Plant Protection Act, 2011.
- Hydro-Electric Power (Amendment) Act, 2013.

Wildlife Management and Conservation Regulations

The Wildlife Management and Conservation Regulations (2013) is a critical piece of legislation which focuses on the management and conservation of wildlife. It addresses issues including the capturing, gathering, collecting, hunting, killing and taking of wildlife. The Regulations cover the use of wildlife for any purpose, including as bush meat, research, and medicinal purposes. It also makes provisions for the classification of wildlife, as well as areas within Guyana. The regulations are already being enforced.

Wildlife Import and Export Bill

The Wildlife Import and Export Bill is being prepared to complement the Wildlife Management and Conservation Regulations. The Wildlife Import and Export Bill will provide a national framework and mechanism to govern the international trade of all species of wildlife in Guyana and to enable Guyana to fulfill its obligation under the Convention of International Trade in Endangered Species. This legislation will allow the Wildlife Division to be classified as an Authority. The Wildlife Import and Export Bill, which was tabled in the National Assembly in 2013, is currently being reviewed and revised. Once enacted, the legislation will repeal the Species Protection Regulations (1999) and Wild Birds Protection Act (1990).

Biosafety/Biotechnology Bill

A Biosafety/Biotechnology Bill, proposed in the National Biosafety Framework (2007), was drafted and is currently undergoing consultations. Thereafter, the Bill is expected to be reviewed and presented to the National Assembly for consideration.

ABS Regulations

Regulations addressing Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) were drafted. Guyana subsequently acceded to the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization and as a result it became necessary to review and update the regulations to fulfill the requirements of the Protocol.

Protected Areas Act

The Protected Areas Act (2011) provides the framework for the establishment and management of a national system of protected areas, including a mechanism for sustainable long-term financing (the National Protected Areas Trust Fund) and establishment of a PAC. Under the Protected Areas Act, existing and new state-owned protected areas, Amerindian protected areas, privately managed protected areas, and Urban Parks such as the Botanical Gardens and the Zoological Park will comprise the NPAS.

Plant Protection Act

The Plant Protection Act, which was enacted in 2011, provides for the prevention, eradication and control of diseases and pests affecting plants. The Act is administered by NAREI.

Hydro-Electric Power (Amendment) Act

Hydro Power (Amendment) Act (2013) provides for consideration to be given to the conservation and preservation of the environment, flora, fauna, aquatic life and ecological habitat in areas surrounding hydroelectricity generating facilities. The Act also makes provisions for the establishment of hydroelectric reserve offset areas within which activities damaging to the environment are strictly prohibited.

4.3.2 Institutional Framework

Since the preparation of the Fourth National Report, Guyana has further strengthened its institutional framework to ensure the sustainable utilization and protection of natural resources. One key action is the creation of a Ministry with specific responsibilities for natural resources and the environment. Additional institutions were also created and adjustments made within existing institutions to further strengthen capacity.

Ministry of Natural Resources and Environment

The Ministry of Natural Resources and Environment (MNRE) was created in 2011 to facilitate the efforts of Government to continue to focus on expanding and diversifying the economy on the basis of rationale use of Guyana's natural resources. The Ministry has the responsibility to coordinate activities in the forestry, mining, environmental management, wildlife, protected areas, and land use planning sectors. In addition, the Ministry has overall responsibility for the following institutions: GFC, GGMC, Guyana Gold Board, GLSC, EPA, Wildlife Management Authority, National Parks Commission and Protected Areas Commission to allow for greater coordination among the principal natural resources agencies.

The administration of environmental affairs is the overall responsibility of the MNRE and is executed by the EPA. Most of the other institutions which have some responsibility for natural resources management also fall under the purview of the MNRE.

Protected Areas Commission

The Protected Areas Commission was established by the Protected Areas Act in 2011. The Commission's functions include establishing, managing, maintaining, promoting and expanding the national protected areas system. This encompasses the monitoring and regulating of activities and the use of resources within protected areas; preparing, developing and effectively implementing management plans; conducting scientific studies and research; providing support and advice to Amerindian Villages to enable them to develop Amerindian PAs; and promoting public involvement in decision-making processes.

Guyana Forestry Commission

The GFC also falls under the purview of the MNRE and the Forest Act 2009 mandates the GFC with the overall management of Guyana's State Forests. Approximately 87% of Guyana's forest cover is classified as State Forest and is under the jurisdiction of the GFC. With the implementation of the LCDS, a Guyana REDD+ Secretariat was established in 2009 as a part of the GFC to coordinate all national REDD+ activities, under the direction of the GFC, Office of the President, and the Office of Climate Change (OCC), and to oversee the implementation of REDD+ activities under the LCDS framework. The GFC is also the lead Agency for developing the MRV System.

Environmental Protection Agency

The EPA, which was established under the EP Act of 1996, is responsible for programmes for the conservation and sustainable use of biodiversity, establishment of national parks and protected areas system, wildlife protection management, and, integrated coastal zone management⁹³. The EPA, in 2013, has established a Compliance and Enforcement Division within its structure to enhance its monitoring and enforcement capabilities.

⁹³ EPA Strategic Plan, 2006 – 2010.

Wildlife Management Authority

The Wildlife Division is to be transformed with the passage of the Wildlife Import and Export Bill to the Wildlife Import and Export Authority which will be the Management Authority of Guyana. The role of the Management Authority will be to ensure the regulation of the international trade in wildlife, to assess the level of the trade and to devise measures to effectively manage the trade in a sustainable manner. The Wildlife Scientific Authority, which is an independent body, will continue to exist to advise the Wildlife Management Authority with respect to whether trade is detrimental to the survival of the species.

National Committees

New committees formed since the Fourth National Reports include the Land Reclamation Committee (LRC) and the Mangrove Action Committee.

The LRC aims to coordinate the efforts on land reclamation of mined-out areas and to provide guidance to the Ministry of Natural Resources and Environment and the GGMC, while building on existing initiatives and recommendations. The deliverables of the LRC are also intended to support the Ministry's Strategic Priority Goal of '*Sustainable Resource Use and Monitoring*' with expectations of restoring key natural resources to their natural state. The composition of the Committee consists of the natural resources agencies and other relevant stakeholders. The LRC is currently examining areas to execute the project.

With the preparation of the National Mangrove Management Action Plan in 2010, a Mangrove Action Committee was established. The Committee comprises representatives of all stakeholders who represent an inter-agency commitment to the restoration and management of mangroves. The function of the Committee is to oversee the progress towards meeting the goals of the Mangrove Management Action Plan.

4.3.3 Education Programmes, Curricula and Other Initiatives

Initiatives are being implemented at different levels relating to education and training so as to improve the capacity locally in order to assist with the implementation of the various measures to ensure sustainable use of natural resources and the conservation and protection of biodiversity. Some of the key initiatives are highlighted below. However, there are other efforts by other stakeholders such as WWF, CI and Iwokrama which all play critical roles in education and training, public awareness, and capacity building for young scientists, etc,

University of Guyana (UG) Science and Technology Support Project

The UG Science and Technology Support Project, which is financed by the World Bank, is currently being implemented. This project aims at contributing to the capacity development, especially human resources, to enable Guyana to successfully implement the LCDS. The Project focuses on those faculties most relevant for science education in response to the human capacity and environmental knowledge demands of the LCDS.

The objective of the Project is to strengthen the four science and technology faculties at UG through infrastructure, research and curricular improvements while developing the basis for improved facilities management and future growth.

The project comprises three components. Component 1 supports carrying out of a science curriculum reform process by updating existing curricula and/or reorienting the existing curricula of UG aimed to support the carrying out of selected research relevant to the LCDS through the provision of research grants to selected UG lecturers. Twice each year, the UG Research and Publications Committee would review standardized research grant applications and apply common criteria to assess (i) their relevance to the LCDS, (ii) potential for funding, and (iii) clearance of any environmental and social safeguard issues. Component 2 supports (a) rehabilitation and/or improvement of existing science laboratory buildings of four faculties located within the UG; (b) provision of scientific and multimedia equipment to

the existing science laboratory buildings; and, (c) establishment of a campus wide internet network within UG to connect its faculties and libraries to the internet and to prepare UG to connect it into an international link. Component 3 supports building of institutional capacity within UG through the provision of technical assistance on managerial and administrative capacities and strategic business planning matters; and honoraria to selected UG staff for carrying out project tasks.

Forestry Training Centre Inc.

The Forestry Training Centre Inc. (FTCI) is an autonomous entity of the GFC that provides critical theoretical and practical exposure to stakeholders on reduced impact logging, road building, forestry inventory and other key components of SFM, forest industry development and management of natural resources. FTCI's mission is to promote the use of Reduced-Impact Logging Techniques, to enhance efficiency and to promote rationalization in the forest industry in Guyana and the region by providing hands-on training to forest managers, supervisors and operators in the forestry sector, including governmental agencies, NGO's and hinterland communities. FTCI's main focus has been the development of local timber harvesting technologies and practices that promote the conservation of forest and the training of field operatives to carry out such practices. A fundamental aspect of the technologies and practices developed is the conservation of the forest environment and its diversity by:

- restricting the size and number of forest gaps;
- implementing directional tree felling that limits damage to residual forest stock;
- carrying out proper planning of the alignment and construction of skid trails and log markets;
- ensuring the economical use of heavy-duty machines; and
- ensuring the conservation of water courses by restrictions on logging on the margins of water courses.

Guyana Mining School and Training Centre Inc.

The Guyana Mining School and Training Centre Inc. was established by the GGMC in 2012 to assist with the supplying of skilled personnel to the mining sector to foster better development of skills and technical knowledge needed to enhance the sector. The training offered, which has theoretical and practical components, responds to the needs of miners such as training in the use of excavators and other heavy-duty machinery, improving mineral recovery, optimizing the use of the sluice box, and other processing equipment. It also targets areas such as sustainability, health and safety, hazardous materials management, etc. The training caters to small- and medium-scale mining operations as well as large-scale ventures.

School of Earth and Environmental Sciences (SEES)

The School of Earth and Environmental Sciences (SEES) was established at the UG in 2005 in recognition of the shared expertise, analytical techniques and complementarities that existed between the Department of Geography, Faculty of Arts and the Environmental Studies Unit, Faculty of Natural Sciences. It was expected that the merger will allow students specializing in the science field to benefit from a broader foundation and the rationalization of overlapping programmes.⁹⁴

The School offers a Bachelor of Science (B.Sc.) Degree in Environmental Sciences and Bachelor of Arts (B.A.) Degrees in Geography, Human Geography and Economic Geography. Recently SEES commenced offering a Postgraduate Diploma/Master of Science (MSc) Degree in Environmental Management, with two specialization streams in Natural Resources Management; and Climate Change and Disaster Management.

The Programme seeks to build capacity amongst national and regional professionals, equipping them with the competencies, knowledge, skills and technical expertise to plan and implement policies, plans, programmes and actions that will enhance development, sustain livelihoods, reduce environmental

⁹⁴ <http://uog.edu.gy/schools/sees/>.

degradation and destruction and improve environmental quality, as well as to effectively plan for and respond to disasters and climate change within a risk management framework. The School also offers short courses in environmentally-related areas, and participates in other activities such as public awareness and research. In addition to SEES, the Faculties of Agriculture and Forestry and Natural Sciences offer programmes directly related to biodiversity.

Bina Hill Institute for Research, Training and Development

The Bina Hill Institute was established in 2001 and works with several partners to conduct training and research and provide other services in the North Rupununi. The aim of the Institute is to build the capacity of the youths of the North Rupununi by developing leadership skills, fostering an appreciation for the Amerindian culture and the management of the environment, while expanding upon the existing social and cultural framework, thus preparing them for life in an ever-changing world.

Training being conducted by Bina Hill Institute includes Natural Resource Management, Forestry, Wildlife Management, Agriculture, Tourism, Business Studies, Life Skills, Traditional Skills, Basic Computer Skills, Mathematics and English. Youths also benefit from leadership training. The training is intended to build capacity for both occupational and economic development. Biodiversity researchers also use the Institute as a base, including fisheries surveys for arapaima and aquarium fish. The Institute has also established Radio Paiwomak and a Youth Learning Centre and supports adult and distance education and literacy programmes. Training opportunities are shared among villages of the North Rupununi.

International Centre for Biodiversity

The GoG has proposed the establishment of an International Centre for Biodiversity Research to be based at the University of Guyana. The Centre will be dedicated to researching Guyana's biodiversity and assessing its economic value and how this can be maximized. The Centre is expected to work with emerging global institutes to ensure that Guyana is integrated with international advances in the relevant fields. The purpose of the initiative is to support the implementation of the LCDS and will follow on from the current UG Science and Technology Support Project. A feasibility study for the Centre has recently commenced.

4.3.4 Sectoral and Cross Sectoral Activities

There are several sectoral and cross sectoral programmes and initiatives which are being implemented that would allow for the protection and conservation of biodiversity.

Mining Land Reclamation and Rehabilitation

There are abandoned mining areas across Guyana which requires some form of reclamation and restoration. In the past, efforts were made to reclaim some of these sites as pilot projects. The Government now plans to intensify these efforts through a Land Reclamation Project which is focused solely on reclamation of mined out areas. The initiative will support the country's commitment to REDD+ and sustainable forestry management and the implementation of the LCDS.

Some reclamation efforts to date include accessing the mined-out pits in Region Seven (Cuyuni-Mazaruni) and Region Eight (Potaro-Siparuni) and conducting studies and surveys in the most recent mined-out areas while replanting trees and other protective vegetation in the old mined-out areas. These exercises, which are primarily carried out by the GGMC, had recently focused on replanting some 10 hectares of mined-out white sand covered land in Mahdia, Region Eight, with the *Acacia mangium*, a multi-purpose plant that facilitates soil fertility by fixing nitrogen in the soil. Replanting efforts are also currently ongoing at Isseneru, Noitgedacht, Aranka, and Arakaka. These activities will spread to other areas. At Noitgedacht, GGMC has been utilizing the mined-out land for three purposes; the planting of *Acacia mangium* and cultivating crops between the *Acacia mangium*, utilizing the old mining pits as fish ponds for sport fishing, and the construction of a recreational facility for the benefit of the youths in the area.

Efforts are also being made to have miners comply with the environmental requirements and reclaim mined out areas and practice progressive reclamation. This will be done through enforcement by the GGMC. The Mining Environmental Regulations (2005) require mining operations to prepare Reclamation and Closure Plans and conduct reclamation and closure activities. Large-scale mining operations are already rehabilitating mined out areas as part of their Closure Plan.

Conservation

Guyana has over the years implemented measures to ensure the conservation and protection of the biological and other natural resources. The LCDS outlined 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. Protection and conservation efforts have a long history, stretching back to 1929 and the creation of the Kaieteur National Park, which was one of the first protected areas in the region. Since then, Guyana has made steady progress in conservation and protected areas development. Key accomplishments include the establishment of the Iwokrama International Centre in 1996 and the creation of the community-owned conservation area at Konashen in 2006. These achievements ultimately paved the way for the Protected Areas Act of 2011, which was a watershed moment for protected areas in Guyana. For the first time, Guyana has in place a national legislative framework that allows for the establishment, management and growth of an effective system of protected areas.

The passage of the Act was followed by the legal establishment of two new protected areas atn the Kanuku Mountains and Shell Beach. These areas joined the existing Kaieteur National Park and Iwokrama Rainforest Reserve, and the COCA at Konashen, which together account for approximately 8.6% of Guyana's landmass. The National Protect Areas System also includes the National Park, Zoological Park and the Botanical Gardens. The location of the protected areas can be observed in the Figure 16.

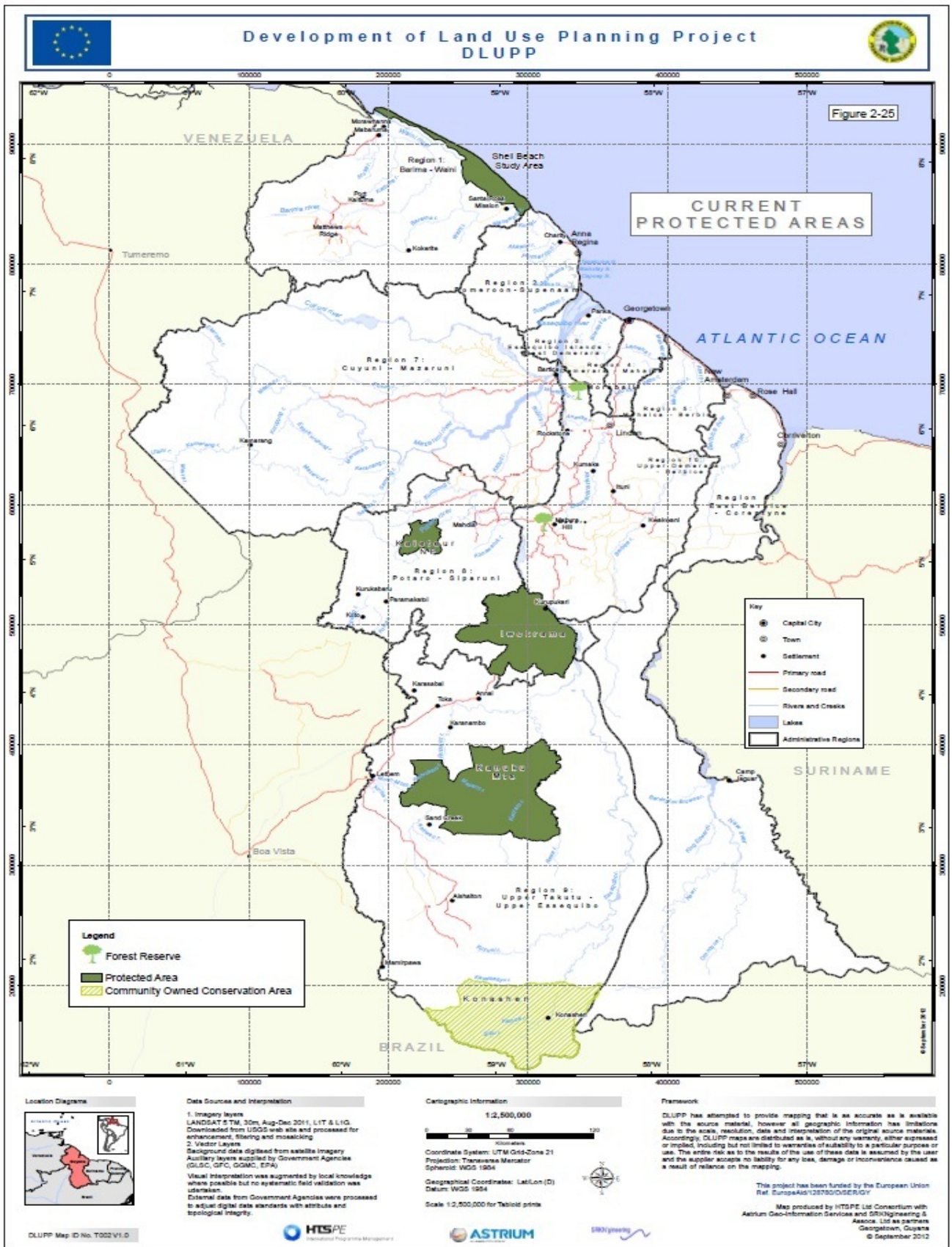


Figure 16: Guyana's Protected Areas.

With the Act in place, 2012 saw the establishment of the PAC office. The initial focus was on operationalizing the legal and institutional framework, raising awareness in communities on the new legislation and the work of the PAC, and preparing management plans for the areas within the NPAS. Progress was made possible in part through a number of long-standing partners for Guyana's protected areas, including the EPA, the Government of Germany, CI, WWF, Fauna and Flora International, and the GMTCS.

The PAC is now working to create new partnerships. One example saw the signing of a MoU with Panthera, which paves the way for future collaborations with the private sector and corporate groups. Current activities are focused on the rehabilitation of the National Park, Zoological Park and the Botanical Gardens under the Three Parks Initiative, facilitating the creation of the National Protected Areas Trust Fund, developing a strategic plan for the PAC, a systems plan for the NPAS, management plans for individual protected areas, and establishing a field presence in these protected areas. Partnerships will also be strengthened with local communities, the private sector, NGOs and other important stakeholders in-country and overseas.

In addition to the national efforts, conservation is also practiced at local levels, mainly through the initiatives of NGOs and CBOs. Some of these measures include sustainable resource extraction and alternative means of livelihood including sustainable tourism operations. The Iwokrama International Centre for Rainforest Conservation and Development (Iwokrama) is currently managing a reserve of 371,000 hectares of rainforest as a protected area to ensure lasting ecological, economic and social benefits and is working with communities within and around the forest to develop sustainable practices in resource management and use.

CI is involved in several initiatives to ensure conservation, including supporting the establishment of the Kanuku Mountains Protected Area and the establishment and management of the COCA. CI is also involved in efforts to support the growth of sustainable community enterprises and the realization of Low-Carbon Livelihoods in the Rupununi. Currently, WWF is also involved in several initiatives in Guyana to promote conservation, including biodiversity assessments, supporting the establishment and management of protected areas, supporting the concept of green economies and payment for ecosystem services, pollution abatement in the gold mining sector, and promoting marine turtle conservation and sustainable fisheries. CI, with support from WWF, and in collaboration with the PAC, has been promoting the use of tools such as land use planning in the identification of priority areas for biodiversity. The GMTCS conducts the monitoring of marine turtle at Shell Beach with support from WWF.

There has also been an increase in activities from CBOs relating to conservation. The COCA 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. Karanambu Trust is involved in activities to ensure the conservation of the Rupununi savannah and wetlands ecosystem. The NRDDB also promotes conservation through its activities, and is involved in several initiatives such as sustainable community tourism, community monitoring, reporting verification system, training and awareness, natural resources management, etc. The South Rupununi Conservation Society is working to protect the endangered Red Siskin (*Carduelis cucullata*), a bird that was trapped to near extinction to supply the cage bird trade. Other communities in the Rupununi are involved in the sustainable management of their traditional lands and resources while some coastal CBOs are engaged in sustainable utilization of resources from mangrove areas.

There are also efforts at both the national and community levels to protect, conserve and enhance mangrove forests along Guyana's coastal areas. Most of these mangroves areas falls outside the protected areas system and as such, additional efforts are being made to protect this area.

Forest Management

Guyana's pristine forest covers approximately 87% of the total land area and has had relatively low rates of deforestation. This is mainly as a result of GoG initiatives to protect and manage the state forest estate.

It is believed that GoG agencies in active collaboration with local communities and non-governmental agencies can protect and maintain the forests in an effort to reduce global carbon emissions and at the same time attract resources for the country to grow and develop. As such, several measures are being implemented to ensure the protection and sustainable utilization of forest resources.

Guyana has a significant logging sector. However, this sector is highly regulated to ensure that activities do not contribute to significant forest loss and impact biological resources. The GFC has implemented several measures to ensure sustainable forest management (SFM) of state forest. Some of these measures are as follows:

- Guyana has developed principles, policies and guidelines for improved forest management and timber harvesting practices. This is reflected in the NFP and National Forest Plan, the Forest Act and management and operational guidelines.
- Forest concessionaires are required to obtain Environmental Authorisation from the EPA and prepare Forest Management and Annual Operational Plans for their operations. Larger concessionaires are required to conduct Environmental and Social Impact Assessments and prepare Environmental Management Plans.
- Guyana has embraced the principles of Reduced Impact Logging and has developed a Code of Practice for Timber Harvesting which outlines measures which has to be complied with by operators within the sector. Some measures include the requirements for exclusion areas and buffer zones, 100% pre-harvest inventory, and guidelines for road construction, felling, skidding, trucking, operational and camp hygiene, and occupational health and safety. In addition, logging on slopes greater than 40% is not allowed and there must be minimum distance of 10 m between harvest trees to minimize the size of canopy openings.
- All large concessions must allocate 4.5% of the total area to biodiversity conservation during the life of the concession. This area must be a representative of the various vegetation types found in that concession and represent all flora and fauna. No harvesting may take place within this area once approved for biodiversity conservation.
- Logging activities must be conducted by a cycle ranging from 40-60 years and harvesting is done only in approved blocks. There is an annual allowable cut for each concession. Harvesting of certain keystone species is also restricted.
- Training in Reduced Impact Logging and other measures are being provided through the Forestry Training Centre Inc.
- GFC monitors each operation to ensure compliance with the required measures.

In addition, Guyana has embraced the REDD+ framework at a national scale. Through this mechanism, the country is consistently developing its efforts to reduce deforestation and forest degradation, and in particular, through the application of sustainable forests management.

A national system to monitor [measure], report and verify emissions or removals of carbon from the forest sector was developed by the GFC and is currently being implemented. The MRV-system provides the basis for reporting in accordance with the principles and procedures agreed to by GoG in relation to reducing emissions from deforestation and forest degradation.

Strong forest governance that exemplifies the principles of sustainable forest management, forest legality, and sustainable development of forest resources, and concurrently balances the social, economic and

environmental dimensions, has been a top priority for the GoG and the European Union⁹⁵. As part of executing this common mandate, Guyana and the EU are currently negotiating a Voluntary Partnership Agreement (VPA) under the existing EU FLEGT Action Plan with the objective of concluding negotiations by September 2015. Guyana and the EU anticipate that the conclusion and effective implementation of the VPA will contribute to the sustainable management of Guyana's forests rural employment and economic development. A VPA will be legally binding on both parties once negotiations are completed and the agreement is concluded. When fully operational, the system provides confidence to the EU buyers that Guyana's timber products were legally sourced.

In addition to the MRVS and the VPA, there are other forest governance initiatives being pursued under the LCDS which are intended to improve sustainability and enforcement of standards to prevent environmental degradation and excessive forest loss. Some of these measures include the country's commitment to the Extractive Industry Transparency Initiative, Independent Forest Monitoring and preparation of a NLUP. Other measures include institutional strengthening and capacity building of regulatory agencies in the natural resources sector.

Further, in 2009, the Governments of Guyana and Norway signed a Memorandum of Understanding which set out how the two countries will "*work together to provide the world with a relevant, replicable model for how REDD-plus can align the development objectives of forest countries with the world's need to combat climate change*". This agreement has resulted in significant steps being undertaken to ensure deforestation is reduced and degraded forest land restored, some of which are described above.

Environmental Impact Assessments

Environmental Impact Assessments (EIAs) are being utilized as a tool to ensure biodiversity is considered in development planning and implementation. The Environmental Protection Act outlines the EIA process to be followed for any project that may significantly impact the environment to the extent of requiring an EIA to be completed. The EPA is mandated to ensure that any project that may have a significant impact on the environment must acquire an Environmental Authorization from the EPA. The EPA has developed EIA Guidelines which further details the process.

As part of the baseline information for an EIA, a biodiversity assessment of the project area has to be conducted. An analysis of the potential impacts of the project on biodiversity of the area has to be done, with special emphasis on habitats and endangered, rare and threatened species. Recommendations then have to be made on the way forward to ensure impacts to biodiversity are prevented/minimized, including mitigation and management measures. Projects requiring the conduct of EIAs include those from the logging and mining sectors.

Projects

Since the Fourth National Report, Guyana has continued to pursue and implement projects which directly satisfy the obligations of the UNCBD and which are also in line with the previous NBAP II. These projects also contributed directly to the protection and conservation of biodiversity. A summary of the key projects currently or recently implemented are outlined in Table 11 below.

⁹⁵ Joint statement on a Voluntary Partnership Agreement (VPA) on Forest Law Enforcement, Governance and Trade (FLEGT) between Guyana and the European Union, Georgetown, 2012.
http://eeas.europa.eu/delegations/guyana/documents/press_corner/euguyanaflegt.pdf .

Table 11: Summary of Projects currently being implemented.

Project Title	Project Objectives	Project Details
Land Reclamation Project.	This project is focused on reclamation of mined-out areas.	Activities are being implemented by GGMC. An Action Plan was prepared and to date, studies and surveys were conducted in the most recent mined-out areas while replanting trees and other protective vegetation is being done in the old mined-out areas in Regions Seven and Eight. Funding of \$500 million Guyana dollars for this initial phase of the project was provided by GoG.
Guyana Protected Areas Systems Project II.	This second phase of GPAS Project aims to ensure the sustainable operation and management of the National Protected Area System and include development of a management plan for the Shell Beach Protected Area, procurement of equipment and infrastructure development for the Protected Area Commission and Kaieteur National Park and other activities such as consulting services, monitoring and reporting.	<p>Several of the activities under this project commenced in 2014. Stakeholders' consultations for the development of the Shell Beach Protected Area Management Plan have commenced and are still ongoing. Work on the Protected Areas Commission building and the Tukeit Guest House is almost completed and mobilization has commenced at Kaieteur Top for the works to be done on the Staff Living Quarters.</p> <p>The project is being funded by KfW Entwicklungsbank (the German Development Bank).</p>
Community Measuring Reporting and Verification (CMRV) Project.	The purpose of the CMRV is to develop and implement a community-based measuring, reporting and verification process for REDD+.	<p>Since 2011, the project has been working with sixteen Amerindian communities of North Rupununi to build local capacity to develop and run a community measuring, reporting and verification system. The project is carried out in collaboration with the NRDDDB, Iwokrama, and the Global Canopy Programme.</p> <p>The project has been building capacity for a local project management team and a total of 32 community members working as data collectors, to successfully run a community-based forest monitoring programme. This initiative has collected a wide range of data on natural resources, forest change, biomass and well-being using smart phones and open source software.</p> <p>The CMRV project has also been working closely with the GFC in testing and demonstrating the efficacy and value of community-based monitoring approaches as part of efforts to inform the development of the national monitoring, reporting and verification system, and in order to support</p>

Project Title	Project Objectives	Project Details
		<p>Amerindian participation in the a proposed 'opt-in' mechanism for REDD+ in Guyana.</p> <p>Further training is taking place in North Rupununi to continue to improve local capacity to independently carry out monitoring activities. There is also an emphasis on working with the Toshaos and Village Councils to integrate the monitoring data into local development and resource management plans.</p>
<p>Local Solutions for Future Challenges: Community-Owned Best Practice for Sustainable Resource Adaptive Management in the Guiana Shield (COBRA).</p>	<p>The COBRA project is studying the impact of new funding sources aimed at addressing emerging challenges, such as climate change, on Amerindian communities, often the most marginalized sectors of society and is also investigating how CSOs are able to work with Amerindian communities in order to respond more effectively to these new funding opportunities. The lessons learnt from the project will be used to build capacity in a wide range of Amerindian communities and influence how policy is developed and delivered in the region and other parts of the world.</p>	<p>The COBRA project commenced in 2012 and is being implemented with Iwokrama, NRDDDB and the communities of the Rupununi serving as the key partners locally. To date, best practices in the North Rupununi along with the challenges faced were documented by the COBRA Team. A Best Practice Video was also produced. As the project is in its final year, initiatives are now being undertaken to expand the project to cover the South Rupununi.</p>
<p>Global Environment Facility Small Grants Programme.</p>	<p>The Global Environment Facility (GEF) Small Grants Programme (SGP) provides grants directly to CSOs, including CBOs and NGOs to design and implement projects that will bring environmental and livelihood benefits to communities. Priority is given to poor and vulnerable communities in the areas of Biodiversity Conservation, Climate Change Mitigation, Sustainable Forest Management and Prevention of Land</p>	<p>To date, approval was granted for eight projects which are now in the implementation phase. The beneficiaries comprise a women's group, a youth group, five Amerindian Peoples group and one farmer's group. Some of the CBOs discussed above benefitted from these grants, including the NRDDDB, South Rupununi Conservation Society, South Central People's Association and the Kanuku Mountain Community Representative Group. These projects are being implemented across six of the ten administrative regions in Guyana, benefitting both coastal and hinterland communities. The total value of the grants approved amounted to US\$606,077.</p>

Project Title	Project Objectives	Project Details
	Degradation, Reduction and/or Elimination of Persistent Organic Pollutants (Chemicals) and Protection of International Waters.	
Guiana Shield Facility.	The Guiana Shield Facility is a multi-donor funding facility for the long-term financing of national and regional activities to conserve ecosystems, protect biodiversity, and to sustain human livelihoods within the Guiana Shield eco-region. This project is the successor to the Guyana Shield Initiative and expected outcomes include report on biodiversity and environmental services; good practices and support to national governments on valuation of environmental services; and improved policies to protect ecosystems	<p>This project commenced in 2010 and will conclude at the end of 2014. The GFC is the focal point for the project given the contribution the GSF can make to the development of the national Monitoring Reporting and Verification System (MRVS). The Guyana project is titled “<i>Strengthening of Guyana’s Technical Capacity to Implement MRVS & Other REDD+ Related Activities</i>”, and is currently being implemented at a cost of USD 539,000. The duration of the project is 24 months, and there are four components, as follows:</p> <ul style="list-style-type: none"> ▪ Component 1- Development of National Reference Level for REDD+. ▪ Component 2- REDD+ Consultations on development of the National MRVS. ▪ Component 3- Exploration of Co-benefits under the MRVS. ▪ Component 4- Development of national REDD+ Strategies
Regional Project for Implementing National Biosafety Frameworks in the Caribbean Sub-region.	To assist member countries to implement effective, operable, transparent and sustainable National Biosafety Frameworks which cater for national and regional needs.	In Guyana, consultations on the national policy were held in 2013 and plans are being made for the policy to be revised based on the feedback received. The Biosafety/Biotechnology Bill was prepared and is now undergoing consultations. The Institutional Framework was prepared in 2013 and recommends that a National Biotechnology and Biosafety Committee be established under the EPA. This will be done once the legislation is enacted. Plans are also on stream to establish a laboratory to conduct risk analyses, etc. Once these initiatives are completed, public awareness activities will be conducted. At the regional level, plans are also on stream to set up a BCH and to offer a Masters programme in Biosafety at regional universities.
Rupununi Low Carbon Livelihoods Project (Leveraging Natural Capital in Guyana’s Rupununi).	The project aims to contribute to healthy and sustainable economic development of the Rupununi Region by creating and strengthening sustainable local-level community-based enterprises with a	The project is being implemented by CI with support from the IDB’s Multilateral Investment Fund. The project, which comprises several components, commenced in 2013 and since then there has been steady progress on the implementation. The project will last for three years and targeting approximately 42% of the population of the Rupununi, including 23 community-based enterprises. Work has commenced on six

Project Title	Project Objectives	Project Details
	<p>focus on nature-based tourism and agriculture. The project will test models for implementation of the LCDS at a local level in the Rupununi and seeks to demonstrate through its outcomes how natural resource-dependent local and indigenous communities in the Rupununi can enhance and ensure sustainability of their livelihoods, whilst maintaining the capacity of the Rupununi to provide environmental services such as carbon sinks and biodiversity.</p>	<p>components of the project including:</p> <ul style="list-style-type: none"> ▪ Baseline Greenhouse Gases, Climate Change and Economic Assessment. ▪ Facilitating a Business, Community and Government Network for Climate Responsive Development In the Rupununi. ▪ Selection and Implementation of Specific Interventions. ▪ Establishment and Implementation of a Revolving Innovation Fund. ▪ Securing Stakeholder Participation through Outreach, Monitoring and Evaluation of Results. ▪ Knowledge Management.

Awareness and Communication

Organization of seminar and interaction meetings, public information programmes on television and radios, school quizzes and competitions, feature articles and news in the local newspapers, magazines and on the internet, film and documentaries, national events such as Mashramani (float parades), Amerindian heritage month and GUYEXPO are some of the means used to create public awareness and share information on biodiversity and other environmentally-related issues in Guyana. Special occasions, such as Moruca Expo, Leguan Nite, Biodiversity Day, Environment Day, and Earth Day have been used to increase public awareness as well.

The MNRE has an online bulletin for sharing information on current affairs on natural resources and the environment. 211 articles have been published between January 2012 and April 2014. The Ministry also presents a weekly television programme El Dorado Shines which focuses on developments in the natural resources sector, including highlighting critical environmental issues.

The National Communications Network (NCN), the state-owned television station, air regular television programmes on farming technology, innovations and other scientific information related to agricultural development. These programmes are mainly intended for farmers. A popular local radio drama series Merundoi has taken steps to highlight the ills of improper garbage disposal with the hope of creating behavioral change among citizens. The episodes on this topic have been aired for some four months and have received positive feedback.

To increase the quantity of environmental reporting, improve the quality of environmental reporting and to recognize the outstanding work of key journalists covering environmental issues, and stimulate their continued efforts, CI sponsored a media award for local journalists. Four journalists won awards for the following articles:

- Wildlife traders warn against dolphin exports.
- Iwokrama canopy walkway to attract tourists, researchers.
- Damage to Konawaruk River.
- Gold mining: an industry on the verge of crisis?

Awareness and use of Guyana's biodiversity will continue to increase as future developments in the eco-tourism sector have been identified in the 2014 National Budget, the National Competitiveness Strategy and the Ministry of Tourism Hinterland Tourism Development Plan which will focus on marketing Amerindian villages as destinations for sports fishing and birding.

4.4 Implementation of NBSAP and CBD

4.4.1 Key Achievements

Over the years, Guyana has taken significant steps toward meeting the obligations of the UNCBD and ensuring conservation and protection of its natural resources. Most of these achievements are in line with the previous NBAP II. Below is a summary of the key achievements, with a focus on achievement since the Fourth National Report:

- The previous four National Reports to the Convention were prepared and submitted.
- The Protocols of the Convention were acceded to. In April 2014, Guyana acceded to the Nagoya Protocol on Access and Benefit Sharing. Guyana had already acceded to the other UNCBD Protocol, the Cartagena Protocol on Biosafety, in 2008. Policies and legislation required by these Protocols are currently being developed.
- Key pieces of legislation were enacted to conserve and protect biodiversity including the Environmental Protection Act (1996), Wildlife Management and Conservation Regulations (2013), Species Protection Regulations (1999), Protected Areas Act (2011), Forest Act (2009), etc. The Wildlife Management and Conservation Regulations were gazette in 2013 and the Wildlife Import and Export, Biosafety and ABS legislations are currently being developed.
- National strategies were developed to assist in biodiversity management and protection, including the Protected Areas Strategy and the much acclaimed LCDS.
- National policies were developed including the National Forest Policy, 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 the National Environmental Action Plan, National Biodiversity Strategy and Action Plan, National Forest Plan, NPAS Plan, National Land Use Plan, and the National Mangrove Management Action.

- Institutional and governance arrangements were strengthened with the creation of the 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 management⁹⁶. Under this new arrangement, all the natural resources related Agencies and Commissions are now under the purview of the Ministry.
- The PAC and the Wildlife Management Authority now play significant roles in ensuring biodiversity conservation and protection.
- Several new committees, such as the Mangrove Action 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.
- Significant progress has been made regarding protected areas, including establishment of the 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 systems plan for the NPAS, management plans for individual protected areas, and establishing field presence in protected areas.
- 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 surveys⁹⁷, WWF South Rupununi Biodiversity Assessment Team Expedition⁹⁸ and Biodiversity Assessment of the Rewa Head⁹⁹.
- Strengthened monitoring through the National and Community MRVS under the LCDS. The MNRE and its agencies have also enhanced their monitoring capacity through the establishment of the Environmental Management Compliance Division at the EPA and the REDD+ Secretariat at the GFC, enhanced technology such as remote sensing, increase in number of field personnel, etc.
- Collaboration with several NGOs achieved in key areas of establishment and management of protected areas, biodiversity assessments, research, training, public awareness, etc.
- Active participation of Community Based Organisations in sustainable use of resources, conservation, environmental and species protection, protected areas management, monitoring, etc.
- Pursuing and implementation of several projects which directly satisfy the obligations of the UNCBD and which are in line with the previous NBAP II.

4.4.2 Challenges and Opportunities

Many challenges, as is expected for a developing country, exist regarding the implementation of the NBAP, most relating to availability of adequate capacity and resources. However, with the recent development, such as having a dedicated Ministry for Natural Resources and the Environment, the pursuing of LCDS and having a more structure NBSAP, there are opportunities to overcome some of these challenges. This section outlines the challenges experienced and presents some opportunities to overcome these challenges.

⁹⁶ 2012 Annual Report, MNRE.

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

⁹⁷ World Wildlife Fund (WWF) - Guianas, 2012. Wetlands of Guyana – An insight into the ecology of selected wetlands with recommendations from WWF-Guianas.

⁹⁸ WWF – Guianas Global Wildlife Conservation, 2013. South Rupununi Biodiversity Team Expedition – Oct 22 - Nov 7, 2013.

⁹⁹ Pickles, R. McCann, N. I. and A. Holland, 2009. *Biodiversity Assessment of the Rewa Head*.

Challenges

Some of the main challenges faced in the implementation of the NBAP II are outlined 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.
- Insufficient coverage of biodiversity in major legislation with the exception of the Wildlife Regulations. This is the only 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.*'
- Limited or no awareness of the NBAP. Many of the institutions (over 50%) consulted in the preparation of this report indicated that they were not familiar with the NBAP. Those that were aware were not utilizing it.
- Stakeholders who were aware of the NBAP indicated that it was too detailed and not user friendly.
- There is currently a lack of quality baseline and trend data on biodiversity. This 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 and biodiversity monitoring) 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.
- In mainstreaming of biodiversity in the productive and ecotourism sectors, a myriad of guidelines, codes and manuals exist that set out the standards applicable to forestry, mining, and agricultural operations but many important biodiversity values (e.g. water sheds, 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. However, environmental impact assessments are usually done prior to the issuance of developmental consent.
- Other critical challenges at the institutional level include the:
 - Need for more coordination and integration among institutions;
 - Need for more funding;
 - Need for more technical skills and qualified persons for analytical work; and
 - 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.

Opportunities

- The revised NBSAP is more structured with a vision statement and clear objectives, targets and actions for biodiversity management until 2020. Through the consultation process, many of the stakeholders are already aware of the NBSAP and what it seeks to achieve. In addition, the document is more user friendly and can be utilized efficiently by all stakeholders.
- Along with the NBSAP, implementation plans were prepared, including a Resource Mobilization Plan, a Capacity Development Plan, a Technology Needs Assessment and recommendations for the Coordinating Structure. These should contribute significantly towards the implementation of the NBSAP.
- With the Ministry of Natural Resources and the Environment now in place, there is a more coordinated effort institutionally amongst natural resources agencies. Also, institutional governance for natural resources and the environmental sector has been strengthened and there is now direct representation at the level of Cabinet, Parliament, etc., allowing for greater attention to be paid to this area, and provision of the necessary mechanisms and resources.
- Now that national development is being pursued in line with a low carbon development path, there is the potential to mainstream biodiversity in all relevant aspect of development.
- There is the potential to access funding for biodiversity-related activities from natural resources agencies such as the GFC and GGMC, as well as from funds such as the Guyana REDD+ Investment Fund.
- Enhanced education and training now being provided by the University of Guyana, the Forestry Training Centre, the Mining School, the Bina Hill Institute, etc. will contribute directly to local capacity building and provide the necessary human resources required to ensure the conservation and protection of biodiversity.
- Increased monitoring of natural resources use by the EPA, GFC, GGMC, NGOs and CBOs will assist in curbing illegal and unsustainable use of these resources.
- With a restructuring of the University of Guyana natural resources programmes to be more in line with the LCDS, there is the opportunity to place more focus on biodiversity, both in the curricula and research activities.
- Given the current trend, there is the likelihood of an increasing role to be played by CBOs, especially relating to sustainable livelihoods, monitoring and sustainable resource use.

SECTION III: PROGRESS TOWARDS 2020 AICHI TARGETS AND CONTRIBUTION TOWARDS RELEVANT MILLENIUM DEVELOPMENT GOALS (MDGs)

5.0 PROGRESS IN IMPLEMENTING THE STRATEGIC PLAN FOR BIODIVERSITY (2011-2020) AND PROGRESS TOWARDS ACHIEVING THE AICHI TARGETS

Table 12 provides a succinct representation (utilizing a format suggested in the resource manual for the fifth national report) of the Guyana’s actions in implementing of the UNCBD Strategic Plan (2011-2020) and progress towards the Aichi Targets. These actions reflect the new development thrust based on a low carbon trajectory, the priority given to agriculture for food security, the importance placed on increasing protection for biodiversity, and new growth areas such as eco-tourism for economic development particularly for hinterland communities.

Table 12: Progress in implementing Strategic Plan for Biodiversity 2011-2020 and Progress towards Aichi Targets.

CONTRIBUTION TO MEETING THE CBD’S GOALS AND TARGETS	NBSAP STRATEGIC OBJECTIVE	PRIORITY ACTIONS	TARGET	PROGRESS
<p>Goal A: 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.</p>	<ul style="list-style-type: none"> ▪ Expand and improve awareness, appreciation and communication on biodiversity and ecosystems ▪ Create stronger and wider national, regional and international partnerships that contribute to achieving the goal and objectives of the NPSAP 	<ul style="list-style-type: none"> ▪ Develop and implement communication strategy in support of implementation of the NBSAP. ▪ Enhance communication and cooperation between relevant sectors and improve public and sectoral understanding of the value of biodiversity. ▪ Increase children’s learning outdoors, and increasing schools’ abilities to teach outdoors. ▪ Restructure and re-orient the Zoological Park 	<ul style="list-style-type: none"> ▪ Full implementation of the communication strategy to begin by 2015. ▪ By 2020, Coastal Wetlands, Savannahs, Mountain Highlands and Rainforests eco-systems featuring in the Zoological Park. ▪ By 2020, all environmental education teachers attended the annual teacher’s environmental education camp at least once. 	<ul style="list-style-type: none"> ▪ Draft communication strategy prepared. ▪ A <i>Three Parks Initiative</i>, which aims to revitalize the National Park, Zoological Park, and the Botanical Gardens, was launched. ▪ A Zoological Park Master Plan was done which illustrated a very sophisticated approach to restructuring and re-orienting zoo exhibits based on ecosystem representativeness. ▪ A Mangrove Visitor Centre hosting 3,000 students per year and 200 visitors per month was constructed. ▪ A potential link between protected areas and support for livelihoods of the mainly Amerindian communities associated with all protected areas, was explored. This led to identifying the marketing of crafts through the Kaieteur National Park and the Zoological Park gift shops. ▪ Annual Teachers’ Environmental Education Camps were held. The camps

		<p>representativeness to highly encourage visitors and enhance informal education through interactive and engaging experiences.</p> <ul style="list-style-type: none"> ▪ Support and encourage schools environment clubs, NGOs and CBOs that carry out biodiversity related initiatives. 		<p>were geared towards enabling the teachers to develop the knowledge and skills to make effective environmental education interventions within their schools and communities. Teaching methods were employed that made maximum use of the surrounding natural environment.</p> <p>http://www.epaguyana.org/index.php?start=1</p> <ul style="list-style-type: none"> ▪ Brochures published on biodiversity, wildlife and invasive species and several articles were published in the national newspapers. There is also a weekly column in the newspapers on matters related to the environment. http://www.epaguyana.org/index.php/downloads/eitdpublications ▪ Published quarterly by the EPA is a newsletter GreenLeaf which provides formation related to the environment including biodiversity in Guyana. http://www.epaguyana.org/index.php/downloads/eitdpublications ▪ <i>A report on Climate Change and Biodiversity Education at the Primary School Level to Support Sustainable and Low-Carbon Development in Guyana</i> (2014) was produced for the National Centre for Education Resource Development by CI-Guyana and CUSO. This report considers one priority action to be the infusion of climate change and biodiversity education into the national curricula. ▪ Organization of seminar and interaction meetings, public information programmes on television and radios, school quizzes and competitions, feature articles and news in the local newspapers, magazines
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				<p>and on the internet, film and documentaries, national events such as Mashramani (float parades), Amerindian heritage month and GUYEXPO are some of the means used to create public awareness and share information on biodiversity and other environmental related issues in Guyana. Special occasions, such as Moruca Expo, Leguan Nite, Biodiversity Day, Environment Day, and Earth Day have been used to increase public awareness as well.</p> <ul style="list-style-type: none"> ▪ The Ministry of Natural Resources and the Environment (MNRE) has an online bulletin for sharing information on current affairs on natural resources and the environment. 211 articles have been published between January 2012 and April 2014. ▪ The NCN, the state owned television station, air regular television programmes on farming technology, innovations and other scientific information related to agricultural development. These programmes are mainly intended for farmers. A popular local radio drama series Merundoi has taken steps to highlight the ills of improper garbage disposal with the hope of creating behavioural change among citizens. The episodes on this topic have aired for some four months and have received positive feedback. ▪ To increase the quantity of environmental reporting, improve the quality of environmental reporting and to recognize the outstanding work of key journalists covering environmental issues, and stimulate their continued efforts, CI sponsored a media award for local
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				<p>journalists. Four journalists won awards for the following articles:</p> <ul style="list-style-type: none"> ○ Wildlife traders warn against dolphin exports. ○ Iwokrama canopy walkway to attract tourists, researchers. ○ Damage to Konawaruk River. ○ Gold mining: an industry on the verge of crisis? <ul style="list-style-type: none"> ▪ Awareness and use of Guyana's biodiversity is expected to continue to increase as future developments in the eco-tourism sector have been identified in the 2014 National Budget, the National Competitiveness Strategy and the Ministry of Tourism Hinterland Tourism Development Plan which will focus on marketing Amerindian villages as adventure destinations for sports fishing and birding.
<p>Goal A: 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.</p>	<ul style="list-style-type: none"> ▪ Consolidate/harmonize policy, legal, regulatory and administrative frameworks that support the sustainable use, protection and management of biodiversity resources 	<ul style="list-style-type: none"> ▪ Review existing legislation to determine the need for further provisions to conserve/use biodiversity sustainably. ▪ Conduct an independent review of the outcomes of Environmental Impact Assessments (EIAs) and their role in protecting biodiversity. ▪ To ensure all developers and operators in mining, forestry and agriculture sector are included in the EPA's 	<ul style="list-style-type: none"> ▪ By 2020, all existing legislation reviewed and the need for further provisions identified. ▪ By 2020, all developers and operators will secure environmental authorisation. ▪ By 2020, develop standards for air and water quality. 	<ul style="list-style-type: none"> ▪ A review of laws and regulations related to the MNRE and its subordinated agencies was conducted in 2012/2013. These were the Constitution, Forests Act, Guyana Lands and Surveys Commission Act, Environmental Protection Act, the Amerindian Act, Mining Act, Protected Areas Act. Selected examples of the weakness identified are highlighted below. <ul style="list-style-type: none"> i. The power to declare specially protected areas in State forests under S.23(1) of the Forests Act is vested in the EPA, presumably in recognition of the function assigned to the EPA by S.4(i) of the EP Act, although this power can only be exercised by the EPA with the approval of the Minister responsible for forestry and on the advice of the GFC. Inconsistent with this, however, are the provisions conferring on the

		<p>environmental authorization process.</p> <ul style="list-style-type: none"> ▪ Develop and improve national standards to guide environmental compliance. 		<p>Minister, acting on the advice of the GFC, the powers to designate protected species and to declare forests on private land as forest conservation areas.</p> <p>ii. Regarding the GL&SC set out in section 4 of the Guyana Lands and Surveys Commission Act, Cap.59:05 (GL&SC Act) its main functions are the following:</p> <p>(a) to compile and maintain an inventory of all the land resources of Guyana, their quality, degree, pattern of utilization and related matters;</p> <p>(b) to prepare land use plans for Guyana or any part of Guyana, except any municipality which is subject to a planning scheme (or interim development control pending the preparation of a planning scheme) under the Town and Country Planning Act.</p> <p>Although the Act confers these functions on the GL&SC, it contains no substantive or procedural provisions concerning the compilation of the inventory or the plan preparation or approval process and the legal status of Land Use Plans (LUPs). This is not an inadvertent omission; the Act contains no such provisions with respect to any of the other functions of the GL&SC. This is because the other major functions vested in the GL&SC by the Act, which relate to the management and development of public lands and to the carrying out of land surveys and oversight of the land surveying profession, are supported by separate pieces of legislation. However, the</p>
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				<p>principal LUP (land use planning) law remains the Town and Country Planning Act, Cap.20:01 (T&CP Act), enacted in 1946.</p> <p>http://www.nre.gov.gy/PDF/Costed%20Strategic%20Framework%20for%20the%20MNRE%20V5_final.pdf.</p>
<p>Goal A: 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 ecological limits.</p>	<ul style="list-style-type: none"> ▪ Improve substantially biodiversity monitoring at the national level and within the key productive sectors. 	<ul style="list-style-type: none"> ▪ Develop EU Forest Law Enforcement, Governance and Trade (FLEGT) timber legality assurance system for Guyana. 	<ul style="list-style-type: none"> ▪ By 2020, all timber for export to the EU will be verified legal and granted a FLEGT license. ▪ By 2020, REDD+ framework established and functioning. 	<ul style="list-style-type: none"> ▪ A Voluntary Partnership Agreement (VPA) is currently being negotiated and is expected to be completed by 2015.
<p>Goal A Target 2 and Goal B: 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.</p>	<ul style="list-style-type: none"> ▪ Improve substantially biodiversity monitoring at the national level and within the key productive sectors. ▪ Promote conservation, sustainable use and value of biodiversity into key productive sectors used for 	<ul style="list-style-type: none"> ▪ Continue with the process of establishing REDD+ framework. ▪ Develop and establish a National Conflict Resolution/ Grievance mechanism for REDD+. ▪ Continue forest carbon monitoring. ▪ Promote integrated tourism, hinterland development and biodiversity 	<ul style="list-style-type: none"> ▪ By 2020, REDD+ framework established and functioning. ▪ By 2020, MRV system in place and functioning. ▪ By 2020, community level MRV system in place and functioning. ▪ By 2016, a National Conflict Resolution/ Grievance Strategy for REDD+ 	<ul style="list-style-type: none"> ▪ The Guyana REDD+ Investment Fund was established in October 2010, with the World Bank as Trustee, following an agreement signed between Guyana and Norway in November 2009, in which Norway agreed to provide Guyana up to US\$250 million by 2015 in performance-based payments for avoided deforestation in support of Guyana's LCDS. The Guyana REDD+ Investment Fund (GRIF) is a multi-contributor trust fund for the financing of activities identified under the GoG's LCDS. To date, the total earned in contribution from Norway is \$115 Million USD. <p>http://www.guyanareddfund.org.</p>

<p>Goal A Target 4 and Target 7: By 2020, areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.</p>	<p>growth, expansion and diversification of the economy.</p>	<p>conservation strategies, where there is potential for these interests to coincide.</p> <ul style="list-style-type: none"> ▪ Promote the integration of biodiversity concerns into mining. ▪ Develop Guidelines for responsible recreational fishing. ▪ Develop better practices in ornamental fish collection and handling guidelines. 	<p>developed and functional by 2020.</p> <ul style="list-style-type: none"> ▪ 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 for fishing published and at least 2 awareness and training programmes conducted per year 	<ul style="list-style-type: none"> ▪ Guyana is a pilot country under the Forest Carbon Partnership Facility (FCPF). Approval of the Grant Agreement by IDB Board was received in December, 2013. The Technical Cooperation Agreement was signed by the Ministry of Finance on behalf of the Government of Guyana in February, 2014. Plans have commenced for the implementation of REDD+ readiness activities under the FCPF. Some of the main activities include conducting of national consultations and outreach on REDD implementation in Guyana; development of a REDD Strategy and REDD Implementation Framework; work on Reference Levels (RLs) as well as the design and implementation of a Monitoring Reporting & Verification System (MRVS). http://forestcarbonpartnership.org/sites/fcp/files/2014/June/Guayana_Readiness_Progress_Fact_Sheet_April_14.pdf. ▪ In 2009, Guyana developed a national framework for a MRVS. The aim of the MRVS is to establish a comprehensive, national system to monitor, report and verify forest carbon emissions resulting from deforestation and forest degradation in Guyana. The initial step allowed for an assessment of forest cover to be completed. To date, two national annual assessments have been conducted. http://www.forestry.gov.gy/Downloads/Guyana_MRVS_Interim_Measures_Report_Year_2_Version_3.pdf. ▪ With support from the regional initiative of the Guiana Shield Facility (GSF) of USD 539,000, the following will be undertaken. <ul style="list-style-type: none"> ▪ Development of National Reference
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				<p>Level for REDD+.</p> <ul style="list-style-type: none"> ▪ REDD+ Consultations on development of the National MRVS. ▪ Exploration of Co-benefits under the MRVS. ▪ Development of national REDD+ Strategies. ▪ A capacity building initiative for 16 Amerindian communities, focusing on the establishment and management of a community MRV system started in 2011. A total of 32 community data collectors were trained and have collected a wide range of data on natural resources, forest change, biomass and wellbeing using smartphones and open source software. This initiative will inform the GFC about the efficacy and value of community-based monitoring approaches. It will also serve to support the participation of Amerindian communities in the proposed „opt-in“ mechanism for REDD+. http://www.forestry.gov.gy/Downloads/Guyana_MRV_workshop_report_Nov09.pdf. ▪ A project on Enhancing Biodiversity Protection through Strengthened Monitoring, Enforcement and Uptake of Environmental Regulations in Guyana's Gold Mining Sector was approved by the CEO GEF in June 2014. http://www.thegef.org/gef/project_detail?projID=5846.
<p>Goal C: Target 11: By 2020, at least 17 per cent of terrestrial and</p>	<ul style="list-style-type: none"> ▪ Improve the status of biodiversity by conserving 	<ul style="list-style-type: none"> ▪ Establish more legally protected areas. ▪ Conduct ecological, management 	<ul style="list-style-type: none"> ▪ 17% of terrestrial area for <i>in-situ</i> conservation in legal protection by 	<ul style="list-style-type: none"> ▪ Protected Areas Act passed in 2011, established the PAC, and the NPAS. The passage of the Act was followed by the legal establishment of two new protected

<p>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.</p>	<p>ecosystems, species and genetic diversity and by restoring biodiversity and ecosystem services in degraded areas.</p>	<p>effectiveness, sustainable finance, capacity needs, policy, protected area integration and mainstreaming assessments.</p> <ul style="list-style-type: none"> ▪ Build capacity for planning, establishment and management of protected areas. ▪ Develop and implement resource mobilization plan to ensure financial sustainability of protected areas. ▪ Conduct evaluations of the effectiveness of protected areas management. ▪ Consider benefit-sharing mechanisms with communities surrounding the protected areas. 	<p>2020 effectively managed and financially sustainable.</p> <ul style="list-style-type: none"> ▪ By 2020, Protected Areas Trust Fund established, have adequate resources, and fully functioning. 	<p>areas - the Kanuku Mountains and Shell Beach. These areas join the existing Kaieteur National Park and Iwokrama Rainforest Reserve, and the Community Owned Conservation Area at Konashen, which together account for approximately 8.6% of Guyana’s landmass. The system also includes the National Park, Zoological Park and the Botanical Gardens. This puts Guyana on course for achieving the target of having at least 17 per cent of land and inland water under some form of protection by 2020.</p> <ul style="list-style-type: none"> ▪ An NPAS Plan, was prepared and awaiting approval. This plan provides a roadmap for the development of the NPAS. ▪ Kaieteur National Park’s Draft Management Plans was revised. Updating of Management Plan for the Kanuku Mountains Protected Area is in progress. Development of a management Plan for the Shell Beach Protected Area has been initiated. <p>A process has begun to have an Amerindian village (Konashen) titled lands be declared an Amerindian Protected Area under NPAS based on an application by the Village Council.</p> <ul style="list-style-type: none"> ▪ The Protected Areas Act, 2011, established the National Protected Areas Trust Fund to provide long-term financing for the NPAS. Regulations for the operation of the Fund as required under the Act were prepared and approved by the Cabinet.
<p>Goal D: Target 14: By 2020, ecosystems that</p>	<ul style="list-style-type: none"> ▪ Improve the status of biodiversity by 	<ul style="list-style-type: none"> ▪ Promote soil health through the prudent utilization of 	<ul style="list-style-type: none"> ▪ The Germplasm Facility (Gene Bank) is formalized 	<ul style="list-style-type: none"> ▪ Environmental and Social Management Plan (ESMP) was prepared in 2014. This plan provides the framework for

<p>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, Amerindian and local communities, and the poor and vulnerable.</p> <p>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.</p>	<p>conserving ecosystems, species and genetic diversity and by restoring biodiversity and ecosystem services in degraded areas.</p>	<p>biological, chemical and physical methods in an eco-system agronomic approach.</p> <ul style="list-style-type: none"> ▪ Strengthen Agriculture In-house and Field Germplasm Facility (Gene Bank) to FAO Germplasm Standards. ▪ Prepare Environmental and Social Management Plan in compliance with the Inter-American Development Bank (IDB) and the Guyana Water Incorporated (GWI) policies concerning environmental protection. 	<p>by end of 2015 in accordance with FAO Germplasm Standards and First Report published in 2016.</p> <ul style="list-style-type: none"> ▪ ESMP prepared by 2014. 	<p>management and mitigation of the environmental and social impacts associated with the Water Supply and Sanitation Infrastructure Improvement Program of the Guyana Water Inc., the company responsible for supplying potable water.</p> <p>http://www.gwiguyana.com/files/Final%20ESMP.pdf.</p>
<p>Goal B: Target 5: By 2020, the rate of loss of all natural habitats,</p>		<ul style="list-style-type: none"> ▪ Conduct a mangrove species mapping and inventory. ▪ Rehabilitate, restore 	<ul style="list-style-type: none"> ▪ Reducing biodiversity loss and showing recovery by 2020. 	<ul style="list-style-type: none"> ▪ A mangrove inventory of the entire coastline was completed. Monitoring of the mangrove forests was enhanced with the establishment of a ranger unit comprising

<p>including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.</p> <p>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.</p>		<p>and protect mangrove belts.</p> <ul style="list-style-type: none"> ▪ Explore new models to combine ecological restoration and the creation of small businesses in mangrove areas. ▪ Assess level of degradation in mined out areas. ▪ Rehabilitate and restore degraded areas with particular focus on mined out areas. 	<ul style="list-style-type: none"> ▪ By 2015, at least three (3) mined-out sites have been duly restored and managed. 	<p>8 rangers monitoring some 36.5 km of mangroves.</p> <p>A mangrove monitoring plan, a code of practice for mangrove harvesting and mangrove monitoring protocols completed. On the policy and regulatory side, mangrove protection is now considered in the National Forest Act. 5 km of mangroves along the coast was restored.</p> <ul style="list-style-type: none"> ▪ An Action Plan was prepared and to date, studies and surveys were conducted in the most recent mined-out areas while replanting trees and other protective vegetation is being done in the old mined-out areas in the administrative Regions 7 and 8. Old mining pits were utilised as fish ponds for sports fishing and a recreational facility for youths was built. Funding of \$500 million Guyana dollars for this initial phase of the project was provided by the Government of Guyana. ▪ A Land Reclamation Committee was established and is currently examining areas to implement pilot projects.
<p>Goal D: 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.</p>	<ul style="list-style-type: none"> ▪ Improve national implementation, monitoring and reporting for Multilateral Environmental Agreements (MEAs) and other bilateral commitments 	<ul style="list-style-type: none"> ▪ Develop national implementation framework for the Nagoya Protocol on Access to Genetic Resources. 	<ul style="list-style-type: none"> ▪ Implementation framework in place and operational by 2015. 	
<p>Goal E: Target 17: By 2015 each Party</p>	<ul style="list-style-type: none"> ▪ Improve national 	<ul style="list-style-type: none"> ▪ Prepare in advance for CBD COP 	<ul style="list-style-type: none"> ▪ Fifth national report submitted in 2014. 	<ul style="list-style-type: none"> ▪ Fifth National Report drafted in August, 2014.

<p>has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.</p>	<p>implementation, monitoring and reporting for Multilateral Environmental Agreements (MEAs) and other bilateral commitments.</p>	<p>meetings.</p> <ul style="list-style-type: none"> ▪ Submit national reports as required. ▪ Revise the NBSAP. ▪ Develop indicators for monitoring the implementation of the NBSAP. 	<ul style="list-style-type: none"> ▪ By 2014, revised NBSAP completed ▪ By 2015, indicators developed, adopted and being used. ▪ By 2015, a status report on the implementation of MEAs related to the NRE sector developed. 	<ul style="list-style-type: none"> ▪ Revised draft of NBSAP completed.
<p>Goal E: 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.</p>	<ul style="list-style-type: none"> ▪ Strengthen the information, knowledge base and capacity for conservation, management and sustainable use of biodiversity. 	<ul style="list-style-type: none"> ▪ Develop a biodiversity research interface with the University of Guyana and other university stakeholders, Conservation International, WWF. 	<ul style="list-style-type: none"> ▪ By 2016, research interface developed with University of Guyana, Conservation International, WWF. 	<ul style="list-style-type: none"> ▪ The PAC, in collaboration with CI and the University of Kent, designed a methodology to spatially map important ecosystems and biodiversity areas in Guyana. The methodology utilised the most current wildlife distribution dataset available for Guyana (over 300 species), as well as various specialized decision support models to arrive at a national map of important areas for conservation/biodiversity. The map produced will be submitted for inclusion in the National Land Use Plan and used to identify gaps in the current terrestrial and inland water coverage in the NPAS.
<p>Goal B: 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</p>	<ul style="list-style-type: none"> ▪ Improve national implementation, monitoring and reporting for Multilateral Environmental Agreements (MEAs) and other bilateral commitments. 	<ul style="list-style-type: none"> ▪ Implement National Biosafety Framework under the Cartagena Protocol on Biosafety. 	<ul style="list-style-type: none"> ▪ Implementation of framework by 2020. 	<ul style="list-style-type: none"> ▪ A National Biosafety Framework was prepared. Guyana is participating in a Regional Project for Implementing National Biosafety Frameworks. Consultations on the national policy were held in 2013 and will be revised based on the feedback received. The Biosafety/Biotechnology Bill was prepared and is now undergoing consultations. The Institutional Framework was prepared in 2013 and recommends that a National Biotechnology and Biosafety Committee be established under the EPA. Plans are

prevent their introduction and establishment.				also on stream to establish a laboratory to conduct risk analyses, etc. The EPA has established a Biosafety Clearing House (BCH) which will serve as a repository for biosafety-related information.
<p>Goal E: 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.</p>	<ul style="list-style-type: none"> ▪ Strengthen the information, knowledge base and capacity for conservation, management and sustainable use of biodiversity. 	<ul style="list-style-type: none"> ▪ Compile and consolidate biodiversity data and information from local, international, web based sources, local and traditional knowledge. ▪ Establish common data standards to allow sharing of information between different databases. ▪ Develop a database system for biodiversity which makes data freely available to users. ▪ Identify and define clearly the data and information needed to support decision-making and to meet international commitments to monitor and assess the status of biodiversity. 	<ul style="list-style-type: none"> ▪ 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). 	<ul style="list-style-type: none"> ▪ The Rupununi Savannah is one of Guyana's most unique and diverse ecosystems and among the last great wilderness areas on Earth. It is home to over 9000 species, including over 2000 vertebrates and many species that are highly endangered globally. World Wildlife Fund-Guianas (WWF Guianas) and Global Wildlife Conservation (GWC) carried out the Southern Rupununi Biodiversity Assessment Team (BAT) expedition to get a snapshot of the region's diversity, collecting data on seven taxonomic groups (mammals, birds, reptiles, amphibians, fish, insects and plants) as well as water quality and natural resource use. The BAT bird team documented 302 species and noted low overlap among sites, which indicates a very high regional diversity. Some notable species recorded included the Red Siskin (IUCN Endangered) and several rare species including the Glossy-backed Becard and Short-billed Honeycreeper. The most interesting species caught was the Orinoco sword-nosed bat (<i>Lonchorhina orinocensis</i>), which represents the first record in Guyana and a distributional range extension of approximately 700 km. http://awsassets.panda.org/downloads/2014_south_rupununi_bat_preliminary_report.pdf.
Goal E:	<ul style="list-style-type: none"> ▪ Secure 	<ul style="list-style-type: none"> ▪ Prepare a resource 	<ul style="list-style-type: none"> ▪ Resource 	<ul style="list-style-type: none"> ▪ GEF SGP was established in 2013. By

<p>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.</p>	<p>adequate resources from national, regional and international sources for the implementation of the NBSAP.</p>	<p>mobilization plan to include both expertise and financial resources.</p> <ul style="list-style-type: none"> ▪ Increase access to GEF, GSF and other funds designed for biodiversity. ▪ Establish the National Protected Areas Trust Fund to provide long-term financing for the NPAS. 	<p>mobilization plan prepared in 2014.</p> <ul style="list-style-type: none"> ▪ By 2015, all of the initial GEF SGP allocated is programmed. ▪ By 2016, at least 2 biodiversity-related projects designed and submitted for GEF Council approval. 	<p>the end of 2013, 90% of the allocation was committed through the approval of eight grants valued US\$606,077 with SGP contributing US\$313,189 while co-financing amounted to US\$292,888. The projects were in the areas of biodiversity conservation, sustainable forest management, climate change and chemicals. The grantees comprised a women's group, a youth group, five Amerindian peoples group and one farmer's group. The projects will be implemented across six of the ten administrative regions in Guyana, benefiting both coastal and hinterland communities.</p> <p>https://sgp.undp.org/index.php?option=com_docman...188.</p> <ul style="list-style-type: none"> ▪ A GEF supported project - Enhancing Biodiversity Protection through Strengthened Monitoring, Enforcement and Uptake of Environmental Regulations in Guyana's Gold Mining Sector was approved in June 2014. The total project cost is \$USD 4,342,270 comprising GEF grant of USD 803,653 and co-financing of USD 3,538,620. The project will focus on strengthening monitoring and implementation of biodiversity-friendly practices in Guyana's gold mining sector to reduce biodiversity loss and maintain ecosystem functionality for the benefit of all Guyanese. <p>http://www.thegef.org/gef/project_detail?projID=5846.</p> <ul style="list-style-type: none"> ▪ Regulations for the operation of the Protected Areas Trust Fund as
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				<p>required under the Protected Areas Act were prepared and approved by Cabinet.</p> <ul style="list-style-type: none">▪ USD10 million (using revenues from the mining sector) was contributed by the GOG to the Protected Areas Trust Fund. USD3.5 million contributed by Conservation International's Global Conservation Fund and USD5 million contributed by the German Development Bank KfW bringing the total endowment of the Fund to USD18.5 million.
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5.1 Contribution of Implementation Actions towards achievement of MDGs

The UNCBD, in its decision VII/32, recognized that achievement of the MDGs, in particular MDG-1, MDG-6 and MDG-7, is dependent on the effective conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resource resources. The United Nations, in its 2000 Millennium Declaration, recognized the fundamental importance of environmental sustainability in development. This was enshrined in MDG 7: Ensure environmental sustainability.



























In 2001, Guyana set an ambitious agenda in its Poverty Reduction Strategy Paper (PRSP) aimed at generating economic growth, improving its provision of social services, enhancing governance structures and progressing in a timely manner towards the achievement of the MDGs by 2015¹⁰⁰. The realization of those goals hinged on a seven-pillared strategy that centered on:

- sound economic policies;
- sustainable environmental protection;
- good governance;
- improved physical infrastructure;
- human resource development;
- improved social services including better provision of safety nets; and
- special intervention strategies for vulnerable populations.

Guyana adopted the Millennium Declaration in 2000. Reports, which charted the country's progress towards attainment of the eight MDGs, were completed in 2003, 2007 and 2011. The 'Status at a Glance' in Table 13 presents an assessment of the likelihood of Guyana meeting the Millennium Development Goals by 2015.

¹⁰⁰ Poverty Reduction Strategy Paper, 2011-2015.

Table 13: "Status at a Glance" showing the likelihood of Guyana meeting the MDGs in 2015¹⁰¹.

Key				
Will target be met?	Likely 	Potentially 	Unlikely 	Not Assessed 
GOALS AND TARGETS	Will target be met?			
	2011	2007	2003	
MDG 1: Eradicate extreme poverty and hunger				
Target 1A: Halve, between 1990 and 2015, the proportion of people living in extreme poverty				
Target 1B: Achieve full and productive employment and decent work for all, including women and young people				
Target 1C: Halve, between 1990 and 2015, the proportion of people suffering from hunger				
MDG 2: Achieve universal primary education				
Target 2A: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling				
MDG 3: Promote gender equality and empower women				
Target 3A: Eliminate gender disparity in primary and secondary education preferably by 2005...				
...and to all levels of education no later than 2015				
MDG 4: Reduce child mortality				
Target 4A: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate				
MDG 5: Improve maternal health				
Target 5A: Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio				

¹⁰¹ MDG Progress Report, 2011.

GOALS AND TARGETS	Will target be met?		
	2011	2007	2003
Target 5B: Achieve by 2015, universal access to reproductive health			
MDG 6: Combat HIV/AIDS, malaria and other diseases			
Target 6A: Have halted, by 2015, and begun to reverse the spread of HIV/AIDS			
Target 6B: Achieve by 2015, universal access to treatment for HIV/AIDS for all those who need it			
Target 6C: Have halted, by 2015, and begun to reverse the incidence of malaria and other major diseases			
MDG 7: Ensure environmental sustainability			
Target 7A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources			
Target 7B: Reduce biodiversity loss, achieving by 2010, a significant reduction in the rate of loss			
Target 7C: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation			
Target 7D: By 2020, to have achieved a significant improvement in the lives of slum dwellers			
MDG 8: Develop a global partnership for development			
Target 8A: Develop further an open, rule-based, predictable, non-discriminatory trading system			
Target 8B: Address the special needs of the least developed countries, in relation to ODA			
Target 8C: Address the special needs of landlocked developing countries and small island developing States			
Target 8D: Deal comprehensively with the debt problems of developing countries			
Target 8E: In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries			
Target 8F: In cooperation with the private sector, make available the benefit of new technologies, especially information and communications			
Note: MDG 8 to develop global partnerships has not been assessed in country. Progress made towards these targets is largely dependent on developments in the international setting.			

With respect to MDG1, Guyana has met the target of halving the proportion of people who suffer from hunger, and has improved its performance in reducing poverty and increasing employment. Table 14 shows Guyana's poverty profile. The majority of Amerindians who reside in the rural interior, continued to exhibit the highest poverty level notwithstanding the steady progress made in reducing poverty among this group since 1992¹⁰².

¹⁰² Poverty Reduction Strategy Paper, 2011-2015.

Table 14: Guyana's Poverty Profile and Regional Distribution¹⁰³.

REGION	1993		2006	
	Percentage in poverty	Share of the population	Percentage in poverty	Share of the population
Urban	27.0	32.2	18.7	28.2
Rural Coastal	45.1	56.0	37.0	60.1
Rural Interior	78.6	11.8	73.5	11.7
Total	43.2	100	36.1	100
(1) Barima-Waini	78.9	3.5	80.1	3.2
(2) Pomeroon- Supenaam	55.0	6.7	51.9	6.3
(3) Essequibo Island - W. Demerara	45.8	10.9	40.1	14.1
(4) Demerara- Mahaica	32.0	39.8	24.6	42.4
(5) Mahaica- Berbice	56.4	7.5	42.6	6.1
(6) E. Berbice- Corentyne	37.2	17.0	28.5	15.8
(7) Cuyuni –Mazaruni	44.7	2.6	61.4	2.5
(8) Potaro- Siparuni	94.8	1.9	94.3	1.5
(9) Upper Takatu – Upper Essequibo	93.3	3.8	74.4	3.0
(10) Upper Demerara- Berbice	30.9	6.4	39.4	5.3
National	43.2	100	36.1	100

Climate change is a key driver of biodiversity loss, and moderating climate change will, in the long term, safeguard ecosystem services. Protecting biodiversity will in turn help to moderate climate change and to adapt to its unavoidable consequences¹⁰⁴.

With respect to MDG7, the target of integrating the principles of sustainable development into country policies and programmes has been achieved through the implementation of Guyana's LCDS¹⁰⁵. With the successful implementation of the LCDS, Guyana can avoid cumulative forest-based emissions of 1.5 gigatons of carbon dioxide equivalent (which includes other greenhouse gases) by 2020 that would have been produced by an otherwise economically rational development path. The Kingdom of Norway has committed to providing Guyana with financial support of up to US\$250 million by 2015 for results achieved in limiting emissions from deforestation and forest degradation. On November 09, 2009, the Governments of Guyana and Norway signed a Memorandum of Understanding to this effect. To date, US \$115 million has been received from three consecutive performance based payments. In 2013, a total of four Guyana REDD+ Investment Fund (GRIF) projects, with a combined approximate value of US \$30 million, were in their implementation phases. These projects include:

- the US \$7 million Institutional Strengthening project where significant progress was made towards the development of Guyana's first national scale Monitoring, Reporting and Verification System (MRVS);
- the US \$6 million allocation to the Amerindian Development Fund (ADF) where disbursements were made to all 26 of the initial beneficiary communities for the implementation of their development plans in promoting sustainable village economies;

¹⁰³ MDG Progress Report, 2011.

¹⁰⁴ Biodiversity, Development and Poverty Alleviation. Recognizing the Role of Biodiversity for Human Well-being, 2010. <http://www.cbd.int/doc/bioday/2010/idb-2010-booklet-en.pdf>.

¹⁰⁵ MDG progress report, 2011.

- the US \$5 million Micro and Small Enterprise Development project, where loans with reduced interest rates are made available to entrepreneurs with business ventures in low carbon sectors; and
- the US \$10.7 million Amerindian Land Titling project.

One of five indicators chosen to demonstrate progress towards MDG, is the '*ratio of area protected to maintain biological diversity to surface area*'. Highly aggregated indicators such as this one can give a useful impression of the state of protection of biological diversity at a global. However, the main value of biological diversity in supporting sustainable development is manifested at much smaller scales – at local or national levels¹⁰⁶. At these levels, various aspects of biological diversity can play many different, often vital, roles: in food security in the provision of resources such as fuel-wood and timber; in management of water resources in river and lake catchments; in local climate amelioration; and, increasingly, in local income and employment generation.

In 2005, an *ex post* evaluation of an ITTO project directed at 180,000 ha of the Iwokrama forest concluded that the most remarkable achievement was the impact on the surrounding communities¹⁰⁷. A multi-stakeholder body, the NRDDDB, was formed to represent the communities in matters relating to Iwokrama and development in their own communities.

As of 2014, the NRDDDB represents 16 communities (villages) with a total population of some 6,000 persons who are shareholders and participants in the IIC's sustainable timber, tourism and research operations and who share benefits through co-management of the forest utilizing benefit-sharing agreements.

Approximately 60 percent of Iwokrama's staff come from the communities¹⁰⁸. Iwokrama has worked with the NRDDDB to develop the Makushi (consisting mainly of women) Research Unit (MRU), Community Environmental Workers (CEW's), and Wildlife Clubs.

The Bina Hill Institute¹⁰⁹, established in 2001, works under the umbrella of the NRDDDB, Iwokrama and other institutions, to develop training, research and other resources in the communities. The Institute also established Radio Paiwomak, the first Amerindian owned radio station. Over the years, the Institute has expanded its training efforts to include natural resource management, traditional knowledge systems, and building capacity for both occupational and economic development. Among the range of training conducted are:

- Agricultural training including veterinary science, plant science, horticulture, and pest control.
- Understanding laws and resource mapping for the development of sustainable businesses involving timber, tourism, medicinal plants, aquarium fish, and honey.
- Professional skills development such as in carpentry, masonry, boat and other vehicle operation and mechanics, cooking, sewing, microscopy and computer use, as well as training for guides, rangers, community environmental workers, teachers, and nurses.
- Organizational skills development such as household and village financial management, governance, and leadership.

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 social and economic benefits derived from mangrove forests by coastal

¹⁰⁶ MDGs Indicator 26: Protected Areas Report, 2007.

<http://www.bipindicators.net/LinkClick.aspx?fileticket=KqPsQE6RWHo%3D&tabid=71&mid=519>.

¹⁰⁷ Ex-post evaluation Report D 10/97 Rev.1 (F) "A Sustainable Management Model in the Iwokrama Rain Forest". Executive Summary.

www.tropicalforests.ch/files/.../PD_10_97_project_evaluation.pdf.

¹⁰⁸ Access and benefit sharing – Iwokrama's experience. Benn, V.

Iwokrama International Centre Stakeholders' Workshop December 4, 2013. <http://www.iwokrama.org>.

¹⁰⁹ NRDDDB <http://nrddb.org/bhi%20>.

communities who are highly dependent on the range of goods and services made available from this coastal ecosystem.

A recent study by Lili E. Llieva of Ca' Foscari University of Venice, Italy¹¹⁰, of the socio-economic importance of the mangrove forest located at Cove and John – Belfield provided an estimation of the total economic value per unit area. Preliminary results of the study indicate the following:

- The contribution of mangroves to fisheries in the area Cove and John to Victoria was calculated to 700 US\$/ha/y.
- The contribution of mangroves to apiculture was estimated at US \$47/ha/y.
- Eco-tourism at the mangrove site contributed an average of US \$274/ha/y.
- Bird hunting for trade and subsistence consumption was valued at US \$59/ha/y.
- Carbon sequestration value was estimated to be US \$117/ha/y.
- The biodiversity value for Guyana was estimated to be US \$12/ha/y.

Mangroves are also natural coastal defenses. They act as natural barriers, reducing erosion, trapping sediments, stabilizing shorelines, and damping wave action, therefore providing protection to the livelihood of the majority of people living along the coast of Guyana. Seven coastal mangrove areas were planted in 2011 with an estimated 123,508 black mangrove seedlings under the GMRP¹¹¹, effectively restoring 2.036 km of mangrove coastal defenses.

There are several active CBOs who are involved in the protection and sustainable use of Guyana's mangrove biodiversity and ecosystems. These CBOs usually partner with NGOs and the Government to implement projects which are beneficial to their livelihood and sustainability. Two of the main CBOs involved in the protection and sustainable utilization of mangroves and mangrove forest include:

Village Mangrove Management Committee

The GMRP has established Village Mangrove Action Committees (VMACs) in communities where restoration sites were established and areas where mangroves are particularly vulnerable. The VMACs work in collaboration with the project to promote mangrove awareness and management at the community level since it was realized that the success of mangrove management and protection is dependent on the involvement of the communities which utilize the mangrove forest. The VMAC structure is designed to ensure that it is a broad-based group representing all segments of the community, including women and youth. VMACs implement projects in their communities that are environmentally-friendly, would benefit members of the community and at the same time spread mangrove awareness messages.

Mangrove Reserve Producers

The GMRP also initiated an alternative livelihood program named the Mangrove Reserve Producers. This initiative aims to provide alternative means of income for people in areas where flourishing mangrove forests exist so that they do not have to destroy the trees for income generating activities such as farming and burnt earth operations. The women's group of this initiative produces items such as cassava bread, coconut biscuits, mangrove honey and beeswax products, and condiments such as dried thyme and peppers, including lime pepper, mango achar, sourie achar and tamarind achar among locally popular food items and condiments. The women's agro-processing activities have also been integrated into mangroves and community tourism.

¹¹⁰ Preliminary findings on the socio-economic importance of mangrove in Guyana, ecosystem service valuation; provided by the Guyana Mangrove Restoration Project.

¹¹¹ Guyana Mangrove Restoration Project – Annual Report, 2011

5.2 Suggested Actions at National, Regional and Global Levels

Based on the information and stakeholder perspectives obtained during the preparation of this 5NR, the following are suggested actions at the global and national level:

- Provide assistance to countries to develop better databases, analyzing and generating better quality information for decision-making and for tracking and measuring results (global).
- Institute a robust monitoring system, without which it will be impossible to demonstrate success of any programmes, action plans, strategies or policies or attribution of this success (local). An opportunity exists to expand the scope of the current MRVS to cover more biodiversity parameters (national).
- Identify 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 preparing national reports (national).

APPENDIX I: Process used to prepare Report, Stakeholders and Material

This Fifth National Report to the UNCBD was prepared 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 local NGOs, and the private sector. Extensive use was made of the guidelines, manuals and other recommended resources for the preparation of Fifth National Report which included but was not limited to, the following:

- Guidelines for the Fifth National Report;
- Resource Manual for the Fifth National Report; and
- Training Module on National Reporting (Focus on Fifth National Report) – January 2013.

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 socio-economic data that would be useful in evaluating the value of biodiversity to the national economy.

Based on this Stocktaking Exercise, which included consultations with key stakeholders, a Draft Report was prepared. The list of documents during the Stocktaking Exercise can be found in Appendix II. Stakeholders consulted are outlined in the table below.

No.	Organisation	Representatives
1.	Protected Areas Commission	<ul style="list-style-type: none"> ▪ Commissioner ▪ Senior Environmental Officer
2.	Private Sector Commission	<ul style="list-style-type: none"> ▪ Chairman
3.	National Agriculture Research Extensions Institute	<ul style="list-style-type: none"> ▪ Project Coordinator, Guyana Mangrove Restoration Project
4.	Ministry of Agriculture	<ul style="list-style-type: none"> ▪ Head, Legal and Inspectorate Division, Fisheries Department
5.	Wildlife Management Authority	<ul style="list-style-type: none"> ▪ Scientific Officer
6.	Environmental Protection Agency	<ul style="list-style-type: none"> ▪ Director, Education, Information and Training Division ▪ Director, Environmental Management Compliance Division ▪ Project Manager, NBSAP ▪ Administrative Director ▪ Senior Environmental Officers, Natural Resources Management Division ▪ Senior Environmental Officers, Environmental Management Permitting Division
7.	Guyana Forestry Commission	<ul style="list-style-type: none"> ▪ Botanist
8.	Guyana Geology & Mines Commission	<ul style="list-style-type: none"> ▪ Senior Environmental Officer
9.	University of Guyana – Centre for the Study of Biological Diversity	<ul style="list-style-type: none"> ▪ Lecturer & Biodiversity Specialist
10	University of Guyana – Faculty of Natural Sciences, Department of Biology	<ul style="list-style-type: none"> ▪ Lecturer
11.	Conservation International - Guyana	<ul style="list-style-type: none"> ▪ Policy Coordinator

No.	Organisation	Representatives
12.	Iwokrama International Centre for Rainforest Conservation and Development	<ul style="list-style-type: none"> ▪ Director, Research Management and Training
13.	National Trust of Guyana	<ul style="list-style-type: none"> ▪ Chief Executive Officer
14.	Guyana Marine Turtle Conservation Society	<ul style="list-style-type: none"> ▪ Country Coordinator
15.	World Wildlife Fund	<ul style="list-style-type: none"> ▪ Marine Turtle Officer

Once the Draft Fifth National Report was prepared, it was then provided to stakeholders for review prior to a National Workshop to be held to discuss the report and gather feedback from stakeholders.

APPENDIX II: Further Sources of Information

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