REPUBLIC OF SIERRA LEONE

Sierra Leone's Second National Biodiversity Strategy and Action Plan 2017-2026

Environment Protection Agency Sierra Leone
Office of the President
The Government of Sierra Leone

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GOVERNMENT OF SIERRA LEONE

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FOREWORD

I have the honour to present the revised National Biodiversity Strategy and Action Plan (NBSAP 2017-2026) for Sierra Leone, which has been developed based on national needs and priorities for the implementation of the Convention on Biological Diversity (CBD) objectives and Aichi Targets.

Sierra Leoneans are becoming increasingly aware of the inextricable relationship between our survival and way of life on the one hand, and biodiversity and the environment on the other. Now than ever before, we are aware that our prosperity and economic development, welfare, spirituality, tradition and culture, health and food security can only thrive in a healthy, biodiversity-rich environment. To this end, environmental sustainability and the protection of wildlife, forests, water, air and land are embedded in our constitution, legislation, policies, political agenda and regulations. It was for this reason that Sierra Leone joined the rest of the world in signing and ratifying the United Nations Convention on Biological Diversity (CBD) in 1994 that seeks to conserve species, genes, habitats and ecosystems, ensure the wise use of biological resources and access to benefit sharing of our genetic resources.

Our continued commitment to the concept and principles of the CBD is manifested in our willingness to provide updates on the status of the nation's implementation of the provisions of the CBD in the midst of emerging challenges. A good number of national development and environment-related strategies and legislative processes, such as the Agenda for Prosperity, Vision 2035, National Programme of Adaptation, Environmental Protection Agency Act, 2008 and the National Protected Areas Authority Act, among others, have strong biodiversity and environment components. The establishment of Environment Protection Agency Sierra Leone (EPASL) in 2008 and the National Protected Areas Authority (NPAA) and Conservation Trust Fund (CTF) by acts of Parliament, respectively, is a manifestation of political will exhibited by the Government of Sierra Leone to oversee, manage and protect Sierra Leone's environment and biodiversity.

Strong collaboration now exists between various ministries, departments and agencies (MDAs) of government led by the EPASL, the National Protected Area Authority (NPAA), the Division of Forestry in the Ministry of Agriculture, Forestry and Food Security, and the Ministry of Fisheries and Marine Resources, and charged with the responsibility of implementing the national biodiversity strategy and action plan. The involvement of universities, relevant NGOs and local communities will enhance the capacity of the Environment Protection Agency, National Protected Area Authority, Forestry Division and other MDAs to effectively deliver on the objectives of this strategy and action plan. It is our hope and desire that by the end of the ten-year period of implementation, the vision for Sierra Leone's NBSAP 2017-2026, which focuses on human development and prosperity through biodiversity conservation, would have been much realised.

I would like to take this opportunity to express my appreciation to all stakeholders who participated in the different workshops for the review and update of the NBSAP and to thank them for their invaluable contributions for the development of the strategy and action plan.

Haddijatou Jallow (Mrs.)
Executive Chairperson, Environment Protection Agency – Sierra Leone

ACKNOWLEDGEMENT

The review of the NBSAP 2004-2010, which led to the development of the NBSAP 2017-2026 could not have been achieved without the unflinching support and commitment of the following Ministries, Departments and Agencies (MDAs) of Government, organisations and individuals from various sectors and social spheres, to whom the Environmental Protection Agency-Sierra Leone (EPASL) on behalf of the Government of Sierra Leone, expresses its profound thanks and sincere appreciation:

- The Office of the President for providing the commitment and leadership;
- The NBSAP Steering Committee for providing the policy and technical direction;
- The invaluable inputs of the various thematic consultants, which formed the foundation for the compilation of this document;
- All government MDAs that participated in the workshops, for their cross-sectoral exchange of ideas and experience during the process;
- All NGOs, members of civil society and local communities who made very useful contributions based on their various experiences and local situations;
- The United Nations Environment Programme (UNEP) and African Union Commission (AUC) for providing the financial and technical support required for the execution of the process; and
- Staff of the EPASL, who were always willing and prepared to undertake the administration, planning and execution of the meetings and workshops,.

We look forward to the UNEP, AUC and African Component of the ACP Capacity Building Program for their continued support towards a successful implementation of Sierra Leone's Biodiversity Strategy and Action Plans over the next 10 years.

We commend the NBSAP team for their dedication and hard work and the United Nations Environment Programme (UNEP), Global Environment Facility (GEF) and African Union Commission for their suggestions and support in updating the NBSAP 2017-2026.

LIST OF ACRONYMS

Aichi	Aichi is a Town in Japan
A4P	Agenda for Prosperity
BWMA	Bumbuna Watershed Management Authority
CAP	Community Action Plans
CBD	Convention of Biological Diversity
CBO	Community-based Organisation
CSSL	Conservation Society of Sierra Leone
CE	Critically Endangered
CEH	Centre for Ecology and Hydrology
CITES	Convention on International Trade in Endangered Species
COP	Conference of Parties
CSMC	Conservation Site Management Committees
CTF	Conservation Trust Fund
DD	Data Deficient
EBA	Endemic Bird Area
EN	Endangered
EPASL	Environmental Protection Agency – Sierra Leone
EVD	Ebola Virus Disease
FBC	Fourah Bay College
FAO	Food and Agriculture
FD	Forestry Division
FFEM	French Global Environment Facility
GDI	Gender Development Index
GDS	Government Decentralisation Secretariat
GEF	Global Environmental Facilities
GoSL	Government of Sierra Leone
GRNP	Gola Rainforest National Park
GPS	Global Positioning System
Ha	Hectare
HDI	Human Development Index
IAR	Institute of Agricultural Research
ICADEP	Inclusive Comprehensive Agriculture Development Programme
IBA	Important Bird Areas
IUCN	International Union for the Conservation of Nature
Km	Kilometre
MAFFS	Ministry of Agriculture Forestry and Food Security
MDAS	Ministries, Departments and Agencies
MEST	Ministry of Education Science and Technology
MFMR	Ministry of Fisheries and Marine Resource
MIA	Ministry of Internal Affairs
MLCPE	Ministry of Lands Country Planning and the Environment
MLGRD	Ministry of Local Government and Rural Development

MMMR	Ministry of Mines and Mineral Resources
MMWS	Mamunta-Mayosso Wildlife Sanctuary
MPA	Marine Protected Area
MTC	Ministry of Tourism and Culture
NA	Not applicable
NBSAP	National Biodiversity Strategy and Action Plan
NEC	National Electoral Commission
NEP	National Environmental Policy
NERICA	New Rice for Africa
NHFR	Non-Hunting Forest Reserve
NGO	Non-Governmental Organisations
NPAA	National Protected Areas Authority
NRDS	National Rice Development Services
NT	Near Threatened
NP	National Park
NU	Njala University
OAU	Organisation of African Unity
PRCM	Regional Partnership for Conservation of Coastal and Marine Zone
PA	Protected Area
PRSP	Poverty Reduction Strategy Paper
REDD	Reduction in Emissions from Deforestation and Degradation
RAP-SL	Reptile and Amphibian Programme – Sierra Leone
RMS	Ramsar Site
RSPB	Royal Society for the Protection of Birds
SLARI	Sierra Leone Agricultural Research Institute
SLBCP	Sierra Leone Biodiversity Conservation Project
SLMA	Sierra Leone Maritime Administration
SLP	Sierra Leone Police
SLRE	Sierra Leone River Estuary
SLWCP	Sierra Leone Wetlands Conservation Project
SMART	Simple Multi-criteria Analysis Ranking Technique
SPU	Strategic Policy Unit
SRL	Sierra Rutile Limited
UNDP	United Nations Development Programme
UNESCO	United Nations Education and Scientific Organisation
VU	Vulnerable
WAPFoR	Western Area Peninsula Forest Reserve
WB	World Bank
WHH	Welthungerhilfe
WWF	World Wildlife Fund

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This National Biodiversity Strategy and Action Plans (NBSAP) for Sierra Leone has been formulated since 2003 (NBSAP 2004-2010) to stem the alarming rate of loss of biodiversity and degradation of ecosystems in various ecological belts in the country. This reviewed version is effective for the period 2017-2026. The development of the NBSAP is a concept that was initiated and sanctioned by the Conference of Parties (COP) of the Convention on Biological Diversity in 2003 as a key requirement for parties of the convention to fulfil their commitment to conserve biodiversity, as required by Article 6 of the Convention.

The reviewed strategy is consistent with two main categories, namely the thematic strategies and general measures, as guided by the Convention on Biological Diversity. The main themes are Wildlife, Forest Biodiversity, Agricultural Biodiversity, Freshwater, Marina and Coastal Biodiversity. The cross-sector strategies and cross-cutting issues include financial resources, policies, regulations and legislation, research and training, capacity building, public participation, planning, monitoring, conservation of protected areas, sustainable use, incentive measures, public education, impact assessment, access to technology, information exchange, sharing of benefits and indigenous knowledge.

Sierra Leone became a signatory to the Convention on Biological Diversity, in 1994 in Bahamas. The development of the NBSAP is consistent with Agenda 21 of the United Nations, which is the Rio Declaration on Environment and Development. In 2003, Sierra Leone developed its NBSAP 2004-2010, but its implementation has had a fair share of successes and challenges. The World Bank, GEF, UNDP, the RSPB and Wetlands International are some of the organisations that supported the NBSAP 2004-2010. There is yet a huge backlog of project objectives to be achieved, which have been considered in the reviewing process.

Key lessons were learnt from the development of the NBSAP 2004-2010 fed into the review and development of the NBSAP 2017-2026. Additional priority thematic areas were identified and addressed, such as intellectual property rights and climate change, collaboration between stakeholders, the problem of overlapping mandates and conflict of interest among government agencies, *inter alia*. The 20 Aichi targets were the key focus in all thematic presentations and group discussions during the national and provincial workshops. The key outcome of the workshops' presentations, plenary and discussion sessions were the identification of the issues and gaps (Appendix V) in national and local efforts to conserve biodiversity.

Section II - Biodiversity and Conservation Status and Trends in Sierra Leone: The Basis for the NBSAP 2017-2026.

The location of Sierra Leone (central coordinates – $6^{o}55'$ – $10^{o}14'$N and $10^{o}14'$ – $13^{o}17'$W) is a quintessential factor that determines the diversity of its ecosystems, vegetation and biodiversity. Much of its estimated 7.1 million people are concentrated in the capital city Freetown and the major provincial urban areas. Agriculture constitutes the key economic activities, accounting for about 65% of the country's gross GNP. Some 70% of the rural population depend on the archaic subsistent slash-and-burn cultivation, leading to the loss large tracts of forest in the country.

Sierra Leone's vegetation comprises two major biogeographic ecosystems: the Sudan-Guinea savanna biome mainly in the north and the Guinea-Congo forest biome mainly in the south-east of the country. Mixed elements of these two major biomes occur in places, mainly in the transition zones between the northern and southern sections. The north to northwest is dominated by mixed elements of woodland and grassland ecosystems. The current vegetation map of Sierra Leone shows about 50% covered in bush fallows and farm vegetation, about 3-5% closed forest and most forest estate being secondary forest. The Gola Forest National Park and the Outamba-Kilimi National Park account for the largest tract of closed forest and savanna ecosystems, respectively, under protection.

Sierra Leone's wetlands cover a land area of about 4,838 km^2, categorised into two main types – the inland wetlands (floodplains, lakes and rivers) with vegetation typical of freshwater swamp forests, riparian zones and bolilands; and the coastal/marine wetlands, mainly associated with mangroves, sand flats and mud flats. The total mangrove estate is ca172, 000 hectares and extends to about 825 km of coastline and 30 to 50 kilometres inland. The coastal resources also include sandy beaches, mud flats, cliffs, wildlife, cultural and historical sites and attractive landscape.

Sierra Leone has over 2000 species of vascular plants including 74 endemic to the West African sub-region and 90 species listed as threatened and near threatened based on IUCN (2016). There are well over 1900 of terrestrial fauna and aquatic fauna of various phyla and classes as shown in Table 4 (excluding other invertebrates); the IUCN (2017) conservation status for various taxa, are also indicated.

Table 4 –The number species of fauna of various taxonomic groups categorized under IUCN threat status. SC – Species of Conservation Concern; NS – Number of species.

Taxonomic group	CR	EN	VU	NT	DD	Total SC	Total NS
Mammals	1	3	11	8	3	26	170
Birds	2	3	10	12	3	30	642
Reptiles	3	3	1	1	0	8	67
Amphibians	0	5	1	13	7	26	55
Fish	0	0	1	6	0	7	180
Butterflies	0	0	0	4	0	4	800
Total number	**3**	**15**	**23**	**28**	**13**	**92**	**1914**

Habitat destruction and degradation is the most potent threat to bird diversity in Sierra Leone, the most destructive of which is agriculture followed by mining. Direct off-takes mainly through subsistence hunting and trapping, historically allowed for natural recovery of wildlife, but presently, the association of the trade with trafficking and economic gain. Nine specific threats to coastal and marine environment are identified; including overexploitation, agriculture and forestry, mining and mineral exploitation, and domestic waste disposal. Figure 12 below displays the relative threat of various anthropogenic factors on biodiversity, particularly to terrestrial environment, using a SMART approach.

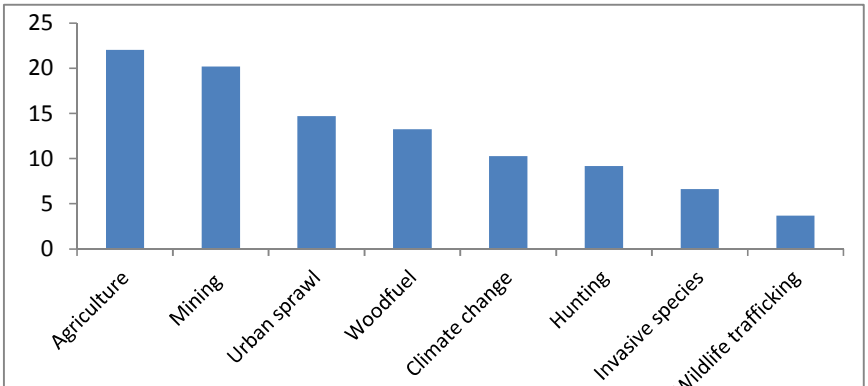


Figure 12 - Relative effects of known threats to biodiversity

Fuel wood production was one of the key reasons for forest restoration programmes with the use of *Gmelina arborea, Acacia mangium* and*Acacia auriculiformes.* A number of trials for mangrove vegetation restoration have been done in different localities along the coastal regions, but the success rate has been minimal. Despite the huge damage to land and vegetation, by mining very little restoration activities are going on. However, good examples of restoration using *Acacia* spp and *Gmelina arborea* are evident in Mokanji, Sierra Rutile and other places around the country.

Weak law enforcement has been a key factor affecting the conservation of species, habitats and ecosystems in Sierra Leone. But for the intervention of international partners like the RSPB, Birdlife International and Wetlands International, among others, who provided funding and technical support to in-situ conservation in key biodiversity concentrations, including surveillance and law enforcement, the country's critical sites for biodiversity would have been in a precarious state. Since 2008 to date, five key policy and legislative actions have been taken to enhance ex-situ conservation effort, including the establishment of the EPA, the NPAA and the drafting of a new Wetlands Act.

In-situ conservation actions were successfully implemented in the following protected areas:

- Gola Forest National Park, established through joint effort from the FD, CSSL and RSPB and funded from a couple of external sources, including the RSPB;
- The Sierra Leone-Biodiversity Conservation Project, a full-sized, stand-alone GEF Project, with a 5-year implementation period, financed by a GEF Grant in the amount

of US $5.0 million, for the conservation of Outamba-Kilimi National Park, Kangari Hills Non-Hunting Forest Reserve and Loma Mountains National Park.

- The Sierra Leone Wetlands Conservation Project (WCP), a full-sized, stand-alone GEF Project, with a four-year implementation period, financed by a GEF Grant in the amount of US$ 1.80 million, for conservation action in Mamunta-Mayosso Wildlife Sanctuary (MMWS) and Sierra Leone River Estuary (SLRE).
- The WAPFoR project, a five-year intervention, which started in March 2009 and ended in February 2014, funded by the EU and implemented by WHH and ENFORAC.
- The APRM Project for the conservation of coastal and marine diversity, including mangroves.

Section III – The Strategy and Action Plan

Sierra Leone's biodiversity has gone through a period of slow, but steady decline since the colonial era, although the situation is not unique to the country, thus the need for the NBSAP. The thematic areas considered in the development of the NBSAP 2017-2026 are consistent with the CBD themes, strategic goals and targets, which are global and correlate neatly with the state of biodiversity conservation in Sierra Leone. This updated NBSAP has five Strategic Objectives consistent with the five Strategic Goals of the CBD, respectively, followed by at total 23 Strategic Outputs. Each strategic output has between three and eight strategies and actions that are have been identified through the various consultative processes and activities over the last three to four years. A total of 119 strategies and actions were listed, each of which has one or a couple of indicators that would form the key focus of the monitoring aspect of the implementation process of the NBSAP. The implementation of the activities of the NBSAP will cost nearly 50 million dollars over the ten year period.

The Vision

Sierra Leone's biodiversity, natural ecosystems and habitats are well protected and sustainable managed for the development and perpetual prosperity and wellbeing of its present and future generations.

The Mission

By 2026, all strategies and programmes geared towards biodiversity conservation are implemented and significant progress made and manifested by improved status of its diverse ecosystems and wildlife, with lasting benefits to the local communities and the people of Sierra Leone.

The National Strategic Objectives

- Sierra Leone's biodiversity is well protected through sound and holistic national legislation and policy implementation across all sectors.

- Practical methods and mechanisms enhanced and functioning to safeguard biodiversity, resulting in improved conservation status of threatened and rare species.

- Practical and robust conservation actions are significantly enhancing the status of species, habitats, sites and ecosystems in and outside protected areas.

- Improved living standards, ecosystem services and opportunities provided to people, particularly local communities through sustainable and inclusive biodiversity conservation actions.

- Improved sectoral and public involvement, and enhanced capacities and awareness, are contributing to effective planning and result-oriented execution of conservation programmes.

Section IV -Implementation of the NBSAP 2017-2026

The development of an NBSAP is only the start of a long path towards the achievement of an ecologically sound and biodiversity rich natural environment. Two important factors that may create impediments to the implementation of the NBSAP are funding and law enforcement. The consistent deficit in Sierra Leone's annual budget means that getting the surplus to fund conservation programmes would be difficult. Fortunately there have been strong commitments from international partners and multilateral donors to provide full or matching funds for the conservation of the biodiversity in the country.

The lack of a proper coordinating mechanism is partly to be blamed for the lapses in the implementation of the NBSAP 2004-2010. Setting up the following functional units is vital to the administration of the NBSAP 2017-2026:

- NBSAP National Steering Committee – comprising 15 members from government agencies, the Universities, NGOs and funding partners.
- NBSAP Implementation Coordination hosted by the EPA or NPAA
- NBSAP Regional Steering Committees comprising government agencies, NGOs and CBOs that are active in the respective administrative regions.

In terms of law enforcement key priority legislative actions, *inter alia*, need to be implemented, some of which are outlined in Box 3 as follows**:**

Box 3 – List of Priority Legislative actions expected during the NBSAP 2017-2026 implementation

- The enactment of the draft reviewed and amended 1972 Wildlife Conservation Act and its Regulations of 2015
- The enactment of the draft reviewed and amended 1988 Forestry Act and its Regulations of 2015.
- Enactment of the newly draft Wetlands Conservation Act and its Regulations of 2015.
- A review of the Mines and Minerals Acts of 2008 to incorporate biodiversity conservation considerations.
- Introduction of policy, guidelines and regulations that incorporates biodiversity into urban development.

Establishing a clearing house mechanism for the NBSAP2017-2026 is one of the major administrative infrastructures recommended by the 10th Conference of Parties of the CBD and is consistent with the general thinking among stakeholders in the biodiversity conservation community in Sierra Leone. Among other things, the clearing house mechanism will ensure the establishment of an organised and operational system of data collation, storage and retrieval and identify training and development opportunities for relevant personnel.

A successful NBSAP 2017-2026 will be one that has undergone effective monitoring and evaluation of its strategies and actions in real time. The NBSAP process does not end with the implementation of activities, but it is important that these activities are monitored and evaluated against their indicators and the achievement of the stated targets within the given time frames. Monitoring rests on the shoulders of all key stakeholders, but the process must be led by the EPA and the NPAA. Monitoring of the NBSAP must be aligned with other national development strategies, national policies and international biodiversity programmes and agreement. This is to ensure that the implementation of the NBSAP is not done in isolation, but holistically addresses biodiversity issues across the board.

SECTION I

THE NBSAP – BACKGROUND AND CONCEPT

Introduction

The concept of biodiversity conservation has been one of the most important and sensitive issues in global environmental discuss. The word "biodiversity" is being used here in a broad sense as defined in the Convention on Biological Diversity as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" This concept therefore includes all forms of natural flora, fauna, ecosystems and habitats. However, scientific and anecdotal evidence show that the world is losing its resilience against environmental stochasticity because of the disturbing rate of depletion of biodiversity, among other factors, leading to hunger, desertification, disease and climate change etc.

The development of the NBSAP is a concept that was initiated and sanctioned by the Conference of Parties (COP) of the Convention on Biological Diversity in 2003 as a key requirement for parties of the convention to fulfil their commitment to conserve biodiversity. Box 1 gives an exact transcript of some excerpts from the CBD (www.cbd.int/nbsap) on importance and purpose of the NBSAP.

The National Biodiversity Strategy and Action Plans (NBSAP) for Sierra Leone was first formulated in 2003 (NBSAP 2004-2010) to stem the alarming rate of loss of biodiversity and degradation of ecosystems in various ecological belts in the country. This revised version is effective for the period 2017-2026. The document incorporates the status and trend of biodiversity as described in the 'Fifth National Report to the Convention on Biological Diversity, prepared in 2014, the threats and pressures exerted on our natural resources by various factors, both anthropogenic and natural, and the need to ensure the conservation and sustainable use and equitable sharing of biological resources.

The NBSAP 2004-2010 development and implementation process revealed a number of challenges and issues that were not previously covered. These new concepts, paradigms and challenges to biodiversity such as climate change, increasing trends in poverty and ecosystem degradation justifies the development of a strategy and action plan that would incorporate these emerging global biodiversity conservation concerns.

The revised strategy, as with the previous version of the NBSAP, incorporates two main components, namely the thematic strategies and general measures, as guided by the Convention on Biological Diversity. The main themes are Wildlife, Forest Biodiversity, Agricultural biodiversity, Freshwater, Marine and Coastal biodiversity. The cross-sector strategies and cross-cutting issues include financial resources, policies, regulations and legislation, research and training, capacity building, public participation, planning,

monitoring, conservation of protected areas, sustainable use, incentive measures, public education, impact assessment, access to technology, information exchange, sharing of benefits and indigenous knowledge.

Box 1 – Transcript of excerpts from the text of the CBD on the NBSAP

National Biodiversity Strategies and Action Plans (NBSAPs) are the principal instruments for implementing the Convention at the national level (Article 6). The Convention requires countries to prepare a national biodiversity strategy (or equivalent instrument) and to ensure that this strategy is mainstreamed into the planning and activities of all those sectors whose activities can have an impact (positive and negative) on biodiversity.

Article 6 of the Convention on General Measures for Conservation and Sustainable Use states that each Contracting Party shall, in accordance with its particular conditions and capabilities:

- Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes which shall reflect, inter alia, the measures set out in this Convention relevant to the Contracting Party concerned.
- 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.

The requirement to integrate consideration of the conservation and sustainable use of biological resources into national decision-making, and mainstream issues across all sectors of the national economy and policy-making framework, are the complex challenges at the heart of the Convention

Adequate and relevant stakeholder mapping and consultation, including the inputs from local communities, CBOs and resource exploiters is a very strong component of the process. The linkages amongst and the involvement of key government ministries, departments and agencies, local and international NGOs, environmental stewardship or responsibility by various sections of society including civil societies groups and organizations underscores the importance of the process. The strategy also lays emphasis on practical community-level involvement against the backdrop of livelihood, tradition and culture. The overriding emphasis across all goals, objectives and outputs being an equitable access, participation and responsibility in biodiversity conservation by all people, irrespective of gender, status and culture.

The Importance of Biodiversity to Sierra Leone

Biodiversity hinges upon the survival of people and communities. There are a host of reasons why biodiversity must be conserved, apart from the inherent moral and aesthetic values. One of the sustainable economic sectors in Sierra Leone is ecotourism, wherein the wildlife and topographic features is attracting a growing number of tourists into the country year on year. The livelihood of the rural population in Sierra Leone, as in most countries in Africa and Asia, incorporate natural resources and high diversity, regardless of whether the agro ecosystems are based on permanent cropping, predominantly pastoral or mixed. This helps to provide resilience in the face of adverse trends or shocks, and offers a greater choice of livelihood options. Traditional medicine, which relies on species of wild and cultivated plants, is the basis of primary health care for the majority of people in developing countries like Sierra Leone. Recreational opportunities and aesthetic value associated with wild birds, salt-extraction, water/fresh water recreational fishing and parks brings in much needed revenue. Biodiversity, from which all these benefits are derived, is therefore indispensable to socio-economic and cultural development.

From an agricultural standpoint, different types of biodiversity are used at different times and in different parts of the country, and so contribute to livelihood strategies in a complex fashion. Understanding how this use differs according to wealth, gender, age and ecological situation is essential for understanding of its contribution to the livelihoods of different members of a community. For example, wild resources are particularly important for the food and livelihood security of the rural poor, women and children, especially in times of stress such as the hungry period when food stocks are low or in a period of drought. These groups generally have less access to land, labour and capital and thus need to rely more on the wild diversity available. At least 70% of the country's population depends on agricultural biodiversity for livelihood. The sector continues to be the main contributor to growth in 2012, in terms both of share (45% of value-added) and of added GDP (just under half of real GDP growth) (Agenda for Prosperity).

Many wild plants and animals have significant economic value by preventing the need for cash expenditure on food, medicines and construction needs as well as providing ready sources of cash to poor households, often yielding a better income than local wage labour (IIED, 1995). The cultural and spiritual values of some elements of agricultural biodiversity are sometimes more highly rated than money. Some plant species are grown for socio-economic and socio-cultural reasons such as: food (e.g. *Mangifera indica*and *Carica papaya*); snake and mosquito repellents and insecticidal properties (e.g. the neem tree), protecting the roof of buildings (e.g. *Gmelina arborea*, *Acacia mangium* and *A.auriculiformis*); shade provision (e.g.*Terminalia catapa*and *Mangifera indica*) while others are believed to embody the spirits of dead relatives.

Even before we consider the equitable distribution of resources, we need to consider the quantumoreconomic value of the resource. Also, of paramount importance is the value of

biodiversity in traditional, cultural and religious diversity. The value of the resources may vary in the eyes of thedifferent groups (FAO, 1991). For instance, sacred groves and cemeteries are conserved as point's ofcontact with dead relatives, where deforestation is prohibited. The use of wild plant species in crossbreeding research has resulted in hybrids with high productivity, disease resistance and other attributes. NERICA rice is a typical example of a cross between *Oryza sativa* and *Oryza glaberima* (Africa Rice Centre, 2008). However, even if the equity conditions are met, it is the quantum of financial and other benefits that is Sierra Leone's 5th National Report to the CBD often assessed by the different beneficiaries.

The NBSAP2004-2010

Sierra Leone became a signatory to the Convention on Biological Diversity, during a meeting of the Conference of Parties of the Convention in 1994 in Bahamas. The CBD came into existence in 1992 after a meeting of the United Nations Environment Programme Conference held in Rio de Janeiro, Brazil, on June 5, 1992, where the world realised the need for a global approach to addressing the problem of loss of biological diversity due to human interference and to promote environmentally sustainable practices by nations. In Sierra Leone several programmes and activities were held to support the government in its bid to adopt Agenda 21, including the National Conference on the Environment (NEC) in 1992.

During the NEC, attended by many government agencies, NGOs and the universities, many issues affecting the general environment in Sierra Leone were addressed through speeches and paper presentations. This conference also culminated into the development of the National Environment Policy (NEP), which among other things focused on the establishment of a green zone to forestall the spate of deforestation on hill slopes in Freetown and the adoption of the concept of buffer zones to protect cores forest areas from indiscriminate poaching.

Despite the civil war (1991–2002), the UN environment bodies supported Sierra Leone biodiversity programmes through a number of project and programmes mainly focussing at capacity development in addition to practical conservation action on the ground. One important project worth mentioning is the NGO-Government Partnership for Biodiversity Action (code named GEF-IBA Project) funded by the Global Environmental Facility (GEF) and coordinated by Birdlife International. This project, which was implemented by nine other countries in Africa, led to the achievement of a significant number of goals including the signing of the Ramsar Convention by Sierra Leone in 2000 and the designation of the Sierra Leone River Estuary as a Ramsar Site. An indirect outcome of the GEF-IBA project is the development of the Gola Forest Concession for Conservation Project which later led to the establishment of the Gola Forest National Park, a process that resulted from collaboration between the Government of Sierra Leone, the Royal Society for the Protection of Birds (RSPB), the CSSL and the local communities.

The concept of the NBSAP is clearly expressed in Agenda 21 of the United Nations, the Rio Declaration on Environment and Development. The agenda specifically requires that nations develop their own strategies and action plans as a key component of the implementation of the Convention of Biological Diversity. In response to this, Sierra Leone took up the challenge in 2001-2002 to development its NBSAP 2004-2010, which was not only a CBD requirement, but was very timely, considering that the country was just emerging from war and it needed to revamp and reorganise its approach to environmental and biodiversity conservation in the midst of post-conflict reconstruction and development. This process was fully funded by UNED and UNDP with institutional and logistic support from the GoSL and its partners.

The NBSAP 2004-2010 development was supported through the establishment of a National Steering Committee, a Technical Committee and a Secretariat headed by the Coordinator of the process. The project proceeded through a series of presentations and literature reviews by experts in the area. The data from the Important Bird Areas (IBA) (Okoni-Williams 2001) process among others, fed significantly into the NBSAP2004-2010. Both national and international experts in various biodiversity themes were called into the process, in order to provide a sense of completeness to the document that was being developed. The entire process culminated into the production of three volumes of the NBSAP for Sierra Leone, as follows:

- National Biodiversity Strategy and Action Plan Volume 1 – Status and Trends in Sierra Leone's Biodiversity.
- National Biodiversity Strategy and Action Plan Volume II – Proposed Strategies and Accounts for Biodiversity.
- National Biodiversity Strategy and Action Plan, Volume III – Strategies and Action Plans.

Implementation of the NBSAP 2004-2010 has had its fair share of successes and challenges. The implementation process is difficult to assess because of the lack of adequate information on progress that have been made since its adoption. However, some noticeable progress has been made in a number of action plans that were specified in the document. Some of the major achievements of the implementation of the strategy and action plan are in the area of education and awareness-raising on the importance of biodiversity in general to human survival, and the establishment of protected terrestrial and marine areas. Though, a wide range of projects have been undertaken in diverse areas of biodiversity conservation including habitats and species, some experts claim the overall level of implementation of 2003 NBSAP's objectives to be relatively low. One of the assessments put the overall achievement as less than 50%; and that 70% of the objectives had a success rate of less than 25%. Figure 1 gives an assessment of the level of achievement of the activities. Much of the achievements were on activities that bordered wildlife, forestry and wetlands conservation. Factors that influenced the results were inadequate coordination amongst project implementing partners, weak to average political will, out-dated and fairly weak legislations and policies, and funding.

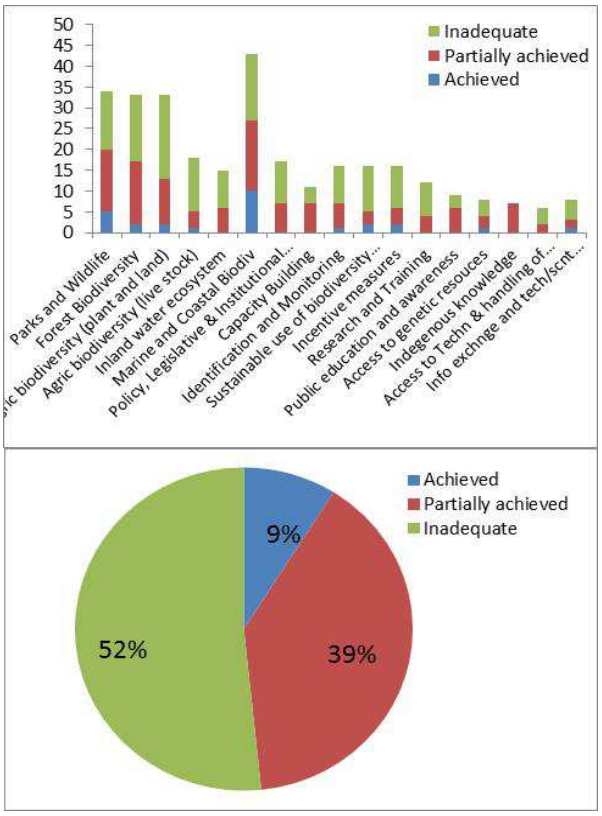


Figure 1 – Relative achievement status of the activities of the 2003 NBSAP. The Pie chart indicates that overall, less than 10% of the activities were fully achieved.

A good number of the achieved strategies and actions received strong financial inputs mainly from multilateral donors such as the World Bank, GEF and UNDP and from international conservation NGOs including Royal Society for the Protection of Birds (RSPB), BirdLife International, Wetlands International, Conservation International, among others. Box 2 below outlines some key achievements that are directly or indirectly associated with the implementation of the NBSAP2004-2010. However, a significant proportion of the projects outlined for implementation were not funded and so there is yet a huge backlog of projects objectives to be achieved. It is under the prevailing situation that the reviewing process and development the NBSAP 2017-2026 has been undertaken.

Some of the key impediments to the implementation of the NBSAP 2004-2010 can be as associated with the following:

- Inadequate funding from government and to a lesser, extent donor fatigue.
- No functional coordinating unit for the implementation of the activities of the NBSAP was instituted.
- Weak coordination and collaboration of the NBSAP-related functions of MDAs as a result of overlapping mandates and conflict of interest.

Box 2 – Some key project achievements directly or indirectly associated with the implementation of the NBSAP 2004-2010

- Gola Forest Concession for Conservation that led to the establishment of the Gola National Park, mainly funded by the RSPB, Conservation International and BirdLife International.
- The Sierra Leone Biodiversity Conservation Project for three protected areas funded by the World Bank and implemented in three protected areas – Outamba-Kilimi National Park, Loma Mountains National Park and Kangari Hills Non-Hunting Forest Reserve.
- The Sierra Leone Wetlands Conservation Project, funded by the World Bank, mainly targeting Mamunta-Mayosso Wildlife Sanctuary and Sierra Leone River Estuary.
- Western Area Peninsula Forest Conservation Project, the conservation of sources of water supply in the forest reserve being one of the key outputs, funded by the European Union through Welthungehilfe (WHH).
- PRCM Project for the conservation of mangrove and the coastal and marine environment. Sierra Leone being part of a regional project. Funded by Wetlands International and Partners

Development of Sierra Leone's NBSAP 2017-2026

The Environment Protection Agency Sierra Leone (EPASL), currently hosts the Focal Point for the CBD and so coordinates the development of the NBSAP 2017-2026. Key lessons were learnt from the development of the NBSAP 2004-2010 that fed into the review process. For instance a Steering Committee was formed (Appendix I), comprising major stakeholders, which provided relevant policy direction and technical support to the process. Also, the involvement of thematic experts and participants from various government and non-governmental agencies ensured a holistic, virtually exhaustive and well-presented document that stood the test of time. Thus, in the review and development of the NBSAP 2017-2026, more national experts and consultants were involved (Appendix II), incorporating new and emerging concepts and paradigms into the new document. Four regional workshops were held in the Northern Province, Eastern Province, Southern Province and the Western Area, respectively covering sectorial agencies, NGOs, CBOs and academic institutions. In additional a final validation workshop was organised, during which the draft revised document was presented and final input sought from participants of diverse interests, backgrounds and expertise. See Appendix III for the full list of MDAs, organisations and civil society groups represented in the regional and validation consultations, respectively.

The purpose of the national and provincial workshops was two-fold. Firstly, to delve into and acquire information on biodiversity and issues surrounding the NBSAP, from people of all relevant sectors in society including personnel from government agencies and other

sectors including, forestry, wildlife, environment, lands, mining, local government sectors, academia, NGOs, civil society and local communities. Secondly, to obtain technical inputs from people of various backgrounds and expertise relating to biodiversity and conservation, including *inter alia*, terrestrial biodiversity(botany and zoology), wetlands ecology, coastal and marine ecology (including fisheries), wildlife and ecosystem management, weather patterns and climate change, intellectual property rights and gender issues.

The flow diagram in Figure 2shows the level of involvement in the review of the NBSAP. The Office of the President hosts the EPASL, which is the main implementing agency of the review process and the compilation of the updated document. The NBSAP 2004-2010document formed the key baseline for the review process and there is significant overlap in data. Additional priority thematic areas not well covered previously were identifying and addressed, such as issues relating to intellectual property right, climate change, land tenure (see Renner-Thomas 2010) and benefit sharing.

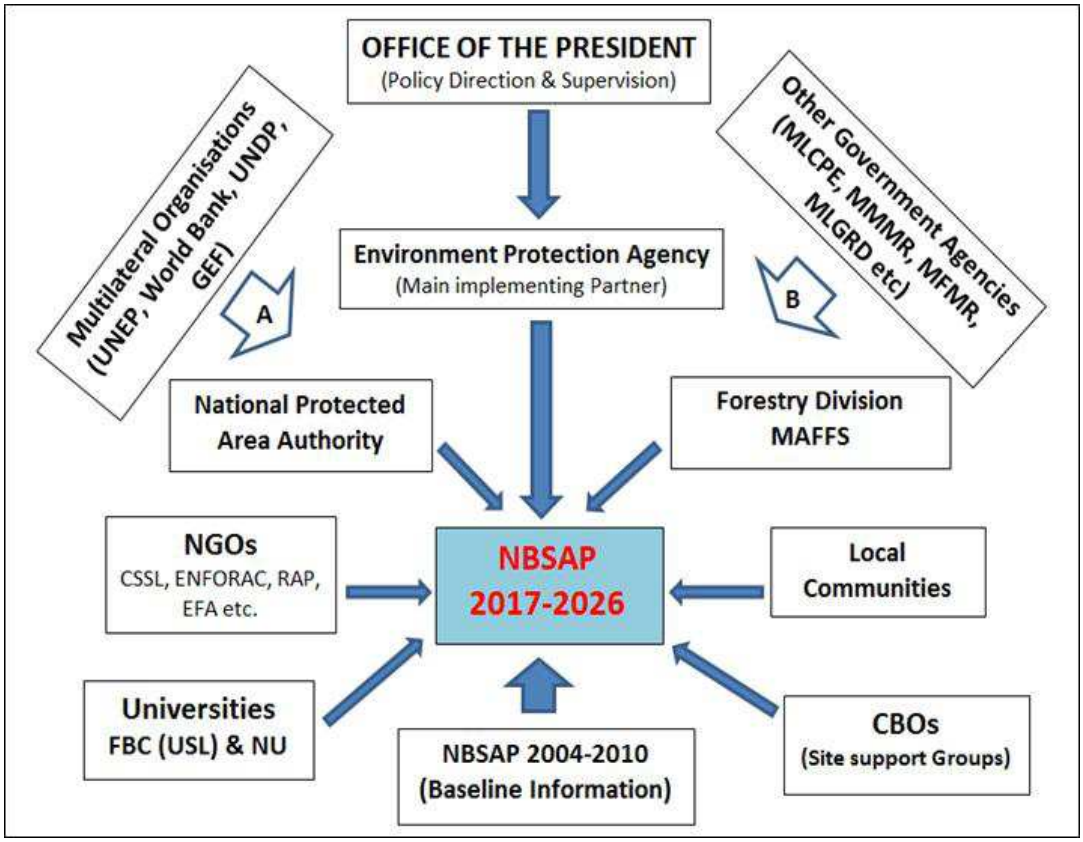


Figure 2 – Flow Diagram showing the level of cooperation for the review of NBSAP 2004-2010 and development of the NBSAP 2017-2026. A – Donor support to the process and its implementation; B – Policy and sectoral support at the government and ministerial level.

Collaboration and cooperation between and among stakeholders were very vital components of the discussions particularly in relation to cross-cutting issues. The perennial problem of overlapping mandates and conflict of interest among government agencies, which has

derailed some national biodiversity programmes, was well addressed with some consensus reached and incorporated into the reviewed NBSAP document. The Strategic Policy Unit (SPU), Office of the Chief of Staff at State House, Office of the President, was identified as a key mechanism through which inter-agencies collaboration can be addressed, particularly on issues regarding overlapping mandates.

The Aichi Targets comprising with five Strategic Goals and 20 Targets (Appendix IV) were the key focus in all thematic presentations and group discussions during the national and provincial workshops. Each study assessed how each of the Aichi Targets has or is being achieved within the concept of domesticating the objectives of the goals and targets of the CBD. The problems associated with the domestication of the CBD and other conventions into national policies, plans, programmes and legislation were also identified.

The key outcome of the workshops' presentations, plenary and discussion sessions were the identification of the issues and gaps (Appendix V) in national and local efforts to conserve biodiversity taking into consideration the gaps in the implementation of the NBSAP 2004-2010, new and emerging concepts and challenges, and the human and material resource capacities needed for effective implementation of the NBSAP 2017-2026. The group work and plenary sessions ensured that all participants, irrespective of their status, the organisations or agencies they represent and their sociocultural background were given the opportunity to contribute meaningfully to the discussion. The issues and gaps identified fed into the development of strategies and actions that constitute the most important components of the NBSAP 2017-2026.

SECTION TWO
BIODIVERSITY AND CONSERVATION STATUS AND TRENDS IN SIERRA LEONE

Introduction

Sierra Leone (central coordinates – 6°55' – 10°14'N and 10°14' – 13°17'W) with a land area of 72,300 sq. Km is located on the west coast of Africa, which is also the east-Atlantic coast in Africa. The countries geographic location is a quintessential factor that determines the diversity of its ecosystems, vegetation and biodiversity. Its population, according to the 2015 census is 7.1 million people (SSL, 2015), with over 40% comprising persons below the age of 15 years. Much of the population is concentrated in the capital city Freetown and the major provincial urban areas. According to UNDP HDI Report (2016), the following data applies to Sierra Leones development status: Life expectancy at birth stands at 51.3 years in 2015; Expected years of schooling and mean year of schooling are given as 9.5 and 3.3, respectively; Gross Domestic Product (GDP) considerably slowed to negative value (because of the EVD outbreak in 2014) implying a corresponding decline in the Gross National income per capita to US $ 1,529; Gender inequality remains very high, with the female Gender Development Index (GDI) value given as 0.392 in contrast with 0.451 for males, resulting in a comparative GDI value of 0.871. The overall Human Development Index value for Sierra Leone in 2016 stands at 0.420, giving a rank of 179 out of 188 countries, which shows a reasonable improvement compared to the last two decades. However, as a measure of multiple deprivations in a household in education, health and living standards, 77.5% of Sierra Leoneans are considered multi-dimensionally poor.

Agriculture constitutes the key economic activities, accounting for almost 50% of the country's GDP, and employing about 60% of the national work force (ICADEP, 2014).The form of agriculture practiced by the vast majority of farmers in Sierra Leone is very rudimentary and is characterized by the archaic slash-and-burn fallow cultivation (Birchall et al., 1979; Gordon et al., 1979; Gleave, 1996). Over the years, as the land availability becomes limited by growing population and traditional governance system, anecdotal evidence show that the farming system has changed from a traditional shifting cultivation (wherein the farming village moving from one location to another to farm) to a more sedentary fallow mechanism (wherein the village remain in one location and the farming plots rotated). Of the national land area, 5,360,000ha (approximately 74%) are arable, of which 80% constitute upland ecosystems (NRDS, 2009). The agriculture sector is the largest employer of about 2.5 million people and accounts for about 50% of GDP, yet less than five percent of the farming families have access to fertilizers, insecticides, herbicides and basic machinery which are resources that could help enhance crop production (NRDS, 2009).

The archaic method of agriculture is the main cause of the loss large tracts of forest in the country, an observation that is consistent with that of IPCC (2007).The rate of loss of primary forest has declined considerably because of the policy and legislative actions over the years and the cyclic nature of the bush fallow system, but other activities such as logging and mining are increasingly degrading viable forest habitats.

The land use pattern in the country is intricately linked with the land tenure system, which has resulted mainly from colonial influence and thus, different systems operates in the Western Area (the former colony) and the provinces (the former protectorate). In the Western area two categories of land are recognized: state land and private land. The land tenure system in the Western Area (Freetown and its environs) is in many respects, different from what obtains in the provincial areas. Much of the land tenure system in the Western Area is influenced by the colonial system inherited from the British system. The land bought for the resettlement of freed slaves was considered to be under the jurisdiction of the British Crown and so tenancy title is passed to land owners through fees and freeholds. The freehold system has been maintained since governance was passed unto the Government of Sierra Leone after independence in 1961 (GOSL, 2005), and this is probably the most important factor influencing the bush fallow system in the Western Area.

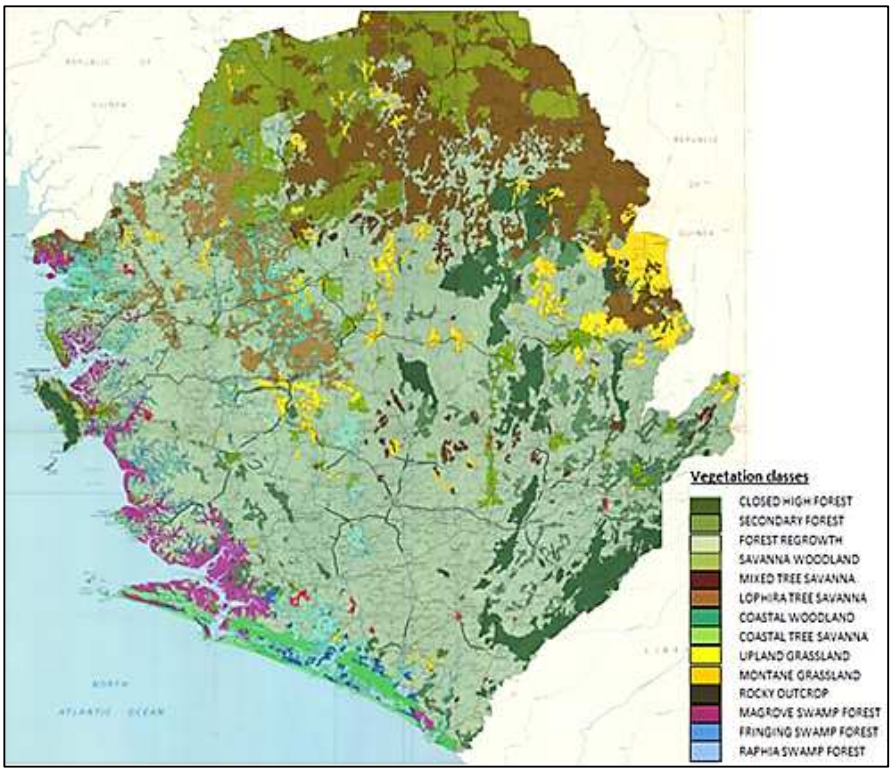
In the provinces, the land tenure system allows the following categories: communal or community land; family land; and individual/private land. These categorizations, which may not be easily distinguished in certain cases, are to a large extent determining the usage of land. A closer examination of the system of customary tenure in the provinces reveals that it is marked with high level of complexity and it stems from the inextricable linkage of landholding with the historic, political, socioeconomic and cultural background of the various native communities (Renner-Thomas, 2010). However, the government has the constitutional powers to convert the use of any portion of land, anywhere in the country by legislation or through negotiations with the owners. An in-depth analysis of the land tenure system in the country is available in Renner-Thomas (2010).

Sierra Leone's Biogeography and Flora

Vegetation distribution

Sierra Leone's vegetation comprises two major biogeographic ecosystems: the Sudan-Guinea savanna biome which occupies most areas of the north to the north-west; and the Guinea-Congo forest biome stretching across the south to north-eastern flank of the country and constitutes the westernmost extent of the Upper Guinea forest endemic area. Mixed elements of these two major biomes occur in places, mainly in the transition zones between the northern and southern sections. The current vegetation map of Sierra Leone (Fig 1) shows a vast area of degraded land (pale green), mainly comprising bush fallows (farm bush), covering approximately 50% of the land area. The closed forest vegetation, which is apparently declining, accounts for only about 3-5% of the land area (Savill and Fox: 1969;

Gordon et al 1980; Unwin 1922), which is a vast difference from the estimated 60% cover over a century ago. However, Elliot and Raisin (1893) observed that most of the country was covered in secondary forest by late 1800s. The Gola Forest National Park accounts for the largest tract of closed forest cover: 71,070 ha representing ca25% of the estimated 285,000 ha of forest estate in the country. Significant closed forests can also be found in the major forest reserves.



In the north to northwest the vegetation is mainly savanna, with mixed elements of woodland and grassland ecosystems. The largest area of savanna ecosystem under protection is the Outamba-Kilimi National Park covering a total of 110,900 ha, in two separate portions; Outamba 74,100 ha and Kilimi 36,800 ha. There are some elements of savanna protected at the Lake Sonfon conservation area, a vast area of unprotected woodland (mainly *Pterocarpus erinaceus*) on the Sula Mountain range and environs and montane grasslands at Loma National Park and Tingi Hills Non-hunting Forest Reserve. In addition, some of these savanna areas are interspersed by patches of closed forest, giving rise to forest-savanna mosaic vegetation. Table 1 shows the distribution of plant communities in the major vegetation types in Sierra Leone.

Table 1 - Diversity of plant communities found in the major ecosystems in Sierra Leone and their land coverage (Source: Karim, 1996)

Plant Community	Area (ha)	% of country
Tropical Closed Forest		
Moist closed evergreen rain forest	358,700	5.0
Moist semi-deciduous forest	258,264	3.6
Moist montane forest	NA-	NA
Secondary forest &forest regrowth	**3,766,350**	**52.2**
Edaphic / Swamp forest		
Fresh inland valley swamp forest	107,610	1.5
Riverine, riparian and gallery forests	35,870	0.5
Mangrove swamp forest	172,176	2.4
Raphia swamp forest	28,690	0.4
Savanna		
Savanna-Forest mosaic -	616,964	8.6
Woodland Savanna	724,574	10.1
Southern Guinea or mixed savanna	265,438	3.7
Lophira tree savanna	107,610	1.5
Coastal park savanna	251.090	3.5
Tropical Grasslands		
Riverine grassland	179,350	2.5
Bolilands (seasonally flooded grasslands)	71,740	0.1
Montane grassland	NA-	NA
Plantations		
Rubber	-	-
Oil palm	71,740	0.1
Cacao and Coffee	165,002	2,3
Forest tree planatations	NA	NA

The wetlands in Sierra Leone cover a land area of about 4,838 km^2(Bah, 1994) and can be categorised into two main types – the inland wetlands (floodplains, lakes and rivers) with vegetation typical of freshwater swamp forests, riparian zones and bolilands; and the coastal/marine wetlands, mainly associated with mangroves, sand flats and mud flats. There are ten major rivers in the county running almost parallel in the northwest direction, many of which empty into the Atlantic Ocean through estuarine systems. The lakes form the catchment area for numerous streams and tributaries associated with the river systems. Lake Sonfon, Lake Mape and Lake Mabesi are the larger lakes, whilst Lake Idrissa, Lake Dakrafi and Lake Ronietta are among the well-known smaller lakes. The rivers and lakes are a major source of ecosystems services to the local communities including water supply, fish and a host of other food and life-supporting resources. The fresh water swamp forests are

ubiquitous in Sierra Leone and consist of *Mitragyna stipulosa, Rophia palma-pinnus, Cala muzdeeratus, Heritiera utilis* and *Rhychospora corymbosa* as the endemic tree species.

The shores of Sierra Leone run for about 560 km northeast to south, and a continental shelf of area 25,000 km^2. There are four major estuarine systems that form the drainage basins of the network of rivers and accounts for the largest proportion of mangrove swamps in the country. The total mangrove estate covers area of 172,000 hectares of mangroves covering about 825 km of coastline, bays and creeks, extending 30 to 50 km inland. The mangrove plant communities comprises of five species - *Rhizophora racemosa, R. harrisonni, R. mangle, Avecenia nitida,* and *Laguncularia racemosa,* which are found differentially in various locations along the river beds and coastlines. Intermingled among the mangroves are other plant species such as *Paspalum vaginatum, Sesuvium sp.* and *Philoxerus vermicularis*. The estimated spatial extent, size of mangrove cover and protection status of these estuarine systems is given in Table 2. Apart from mangroves the coastal resources includes sandy beaches, mud flats, cliffs, wildlife, cultural and historical sites and attractive landscape.

Table 2–Size, mangrove estate and conservation status of the four major estuarine systems in Sierra Leone.

Name	Spatial extent approx.(ha)	Mangrove estate (ha)	Conservation Status
Scarcies River Estuary	NA	13,407	MPA
Sierra Leone River Estuary	259,000	34,234	MPA, IBA, RMS
Yaw Bay	31,605	24,505	MPA
Sherbro River Estuary	NA	99,854	MPA

Botanic characteristics

Sierra Leone has over 2000 species of vascular plants including 74 endemic to the West African sub-region. There are 91plant species listed as threatened and near threatened based on an assessment by the EPA in 2015 and IUCN (2017) Red List of Threatened Species (Appendix V).There is no reliable data to show the distribution of plant species, but from various studies particularly by Cole (1968), Cole (1993), Klop et al., (2008), and *ad hoc* surveys by FD (MAFFS), most of timber resources are found in closed canopy forest formations. Some of the most locally exploited timber species which are now listed as threatened by IUCN (2017) include *Gilbertodendron bilineatus* (VU), *Gilbertodendron splendidum* (VU), *Heritiera utilis* (VU), *Terminalia ivoriensis* (VU) and *Pterocarpus erineaceous* (NT).The number of threatened plant species is apparently correlated with the threat status of the ecosystems and this is the reason for the greater number of threatened forest tree species compared to species from other ecosystems. Table 3 shows the number of threatened plant species in each of the floral families in the country. The full list of threatened plant species is given in Appendix V.

Table 3. The distribution of threatened species among floral families in Sierra Leone

Plant Family	No. of species	Plant Family	No. of species
Leguminoceae	15	Acanthaceae	1
Meliaceae	12	Araceae	1
Sterculiaceae	7	Aristolochiaceae	1
Euphorbiaceae	6	Bombacaceae	1
Annonaceae	5	Boraginaceae	1
Rubiaceae	5	Chysobalanaceae	1
Sapotaceae	5	Combretaceae	1
Asclepiadaceae	4	Cyperaceae	1
Sapindaceae	4	Irvingiaceae	1
Anacardiaceae	2	Menispermaceae	1
Gramineae	2	Ochnaceae	1
Guttiferae	2	Orchidaceae	1
Melastomataceae	2	Podostemaceae	1
Moraceae	2	Rhizophoraceae	1
Rutaceae	2	Salicaceae	1

Diversity of Fauna

Sierra Leone is home to almost 1800 species of terrestrial fauna of various phyla and classes as shown in Table 4, which also indicate their IUCN (2017) threat status.

Table 4 - The number species of various taxonomic groups categorized under IUCN threat status. SC – Species of Conservation Concern; NS – Number of species.

Taxonomic group	CR	EN	VU	NT	DD	Total SC	Total NS
Mammals	1	3	11	8	3	26	170
Birds	0	3	10	12	3	28	642
Reptiles	3	3	1	1	0	8	67
Amphibians	0	5	1	13	7	26	55
Fish	0	0	1	6	0	7	180
Butterflies	0	0	0	4	0	4	800
Total number	**3**	**15**	**23**	**28**	**13**	**92**	**1914**

With the exception of butterflies, this figure, excludes other insects and general invertebrate groups for which little or no studies have been done. In general, recent *ad hoc* studies have highlighted low presence and declining numbers and distribution of species within and

outside national forest estate. However, with reference to the IUCN Red List of Threatened Species (2016), only about 5% of the species in the taxa covered are of global conservation concern.

Mammals

There are about 170 species of mammals, of which are 15 species of primates (six of which are threatened), 18 species of antelopes (16 species considered threatened or locally rare), other species of large mammals (eight are threatened), 45 species of bats (three species are threatened) and a good diversity of other mammalian groups. Table 5 gives the number of species that are listed as threatened according to IUCN (2017).

Table 5–Threatened mammal species in Sierra Leone listed on IUCN Red List and their habitat specificity.

Common/Scientific names	IUCN Status	Main Habitat
Western Chimpanzee Pan troglodytes verus	EN	Forest
Diana Monkey Cercopithecus Diana	VU	Forest
Red Colobus Monkey Poliocolobus badius	EN	Forest
Olive Colobus Monkey Poliocolobus verus	NT	Forest
Sooty Mangabey Cercocebus torquatus	VU	Forest
Pied Colobus Monkey Colobus polykomus	VU	Forest
Guinea Baboon Papio papio	NT	Savanna
Spotted-necked Otter Hydrictis maculicollis	NT	Wetland
Cape Clawless Otter Aonyx capensis	NT	Wetland
Golden Cat Profelis aurata	VU	Forest
Leopard Panthera pardus	NT	Forest
Lion Panthera Leo	VU	Locally EX
West African Manatee Trichechus senegalensis	VU	Wetlands
African Elephant Loxodonta Africana cyclotis	VU	Forest & Woodland
Pygmy Hippo Hexaprotodon liberiensis	EN	Riverine Forest
Bongo Tragelaphus eurycerus	NT	Forest
Zebra Duiker Cephalophus zebra	VU	Forest
Jentink's Duiker Cephalophus jentinki	EN	Forest
White-bellied Pangolin Phataginus tricuspis	VU	Forest
Giant Pangolin Smutsia giganteus	VU	Forest
Water Chevrotin	DD	Forested Rivers
Straw-coloured fruit bat Eidolon helvum	NT	Forest
Tear-drop fruit bat Scotonycteris ophiodon	NT	Forest
Guinea Horseshoe bat Rhinolophus guineensis	VU	Forest
Slender-billed squirrel Protoxerus aubinnii	DD	Forest
Small Sun Squirrel Heliosciurus punctate	DD	Forest
Temmink's squirrel Epixerus ebii	DD	Forest

Avifauna

A total of 642 species of birds have been identified in Sierra Leone from various studies (Dowsett and Dowsett-Lemaire, 1993; Okoni-Williams et al., 2005; Klop et al., 2008; Demey and Okoni-Williams, 2015), comprising 489 resident species and 143 migratory species. The migratory species are categorized into 96 species of Palearctic migrants and 47 species of Intra-African migrants. Of the resident species, 307 show proof of breeding, including 174 species restricted to the Guinea-Congo forest biome of which 15 species are endemic to the Upper Guinea forest Endemic Bird Area (Stattersfield et al., 1998).

Table 6 – Threatened Bird species in Sierra Leone listed on IUCN/BirdLife International 2017 Red List and their habitat specificity.

English and Scientific names	IUCN/BL Status	UGF Endemics	Main habitat
Lesser Flamingo Phoenicopterus minor	NT		Wetland
Hooded Vulture Necrosyrtes monochas	CR		Varied
White-backed Vulture Gyps africanus	CR		Savanna
Bateleur Terathopius ecaudatus	NT		Savanna
Crowned Eagle Stephanoaetus coronatus	EN		Forest
Martial Eagle Polemaetus bellicosus	NT		Savanna
Pallid Harrier Circus macrourus	NT		Open
Lesser Kestrel Falco naumanni	VU		Open
White-breasted Guineafowl Agelastes meleagrides	VU	+	Forest
Great Snipe Gallinago media	NT		Wetland
Damara Tern Sterna balaenarum	NT		Wetland
Grey Parrot Psithacus erithacus	EN		Forest
Rufous Fishing Owl Scotopelia ussheri	VU	+	Forest
Blue-moustached Bee-eater Merops mentalis	NT		Forest
Brown-cheeked Hornbill Ceratogymna cylindricus	VU	+	Forest
Yellow-casqued Hornbill Ceratogymna elata	VU		Forest
Yellow-footed Honeyguide Melignomon eisentrauti	DD		Forest
Western Wattled Cuckoo-shrike Campephaga lobata	VU	+	Forest
Green-tailed Bristlebill Bleda eximia	VU	+	Forest
Baumann's Greenbul Phyllastrephus baumanni	DD		Forest
Yellow-bearded Greenbul Criniger olivaceus	VU	+	Forest
Lagden's Bush-shrike Malaconotus lagdeni	NT		Forest
Rufous-winged Illadopsis Illadopsis rufescens	NT	+	Forest
White-necked Picathartes Picathartes gymnocephalus	VU	+	Forest
Sierra Leone Prinia Prinia leontica	VU	+	Forest
Black-capped Rufous Warbler Bathmocercus cerviniventris	NT	+	Forest
Nimba Flycatcher Melaenornis annamarulae	VU	+	Forest
Gola Malimbe Malimbus ballmanni	EN	+	Forest
Copper-tailed Glossy Starling Lamprotornis cupreocauda	NT	+	Forest
Emerald Starling Lamprotornis iris	DD		Savanna

Thirty species of birds are of global conservation concern, consisting of two critically endangered (CR), three endangered (EN), 10 vulnerable (VU), 12 near threatened (NT) and three data deficient (DD) species (Table 6). Of the 28 species are restricted to the Upper Guinea Forest (EBA 084), 14 occur in Sierra Leone. A significant proportion of the threatened species occur in forest ecosystems, whilst forest reserves constitute the strongholds of most of the populations of these species.

Herpeto-fauna

The herpeto-fauna (reptiles and amphibian) diversity indicates a total of 122 species: 67 species of reptiles and 55 species of amphibians. Though not well studied, the reptiles are very wildly distributed in all habitats, both aquatic and terrestrial. The reptilian diversity includes: three species of crocodiles (two globally threatened); five species of marine turtles (all globally threatened); many species of tortoises (two globally threatened); four species of monitor lizards (one globally threatened) (see Table 7 for species that are listed as threatened by IUCN (2016). Three of the species given in Table 7 are listed under critically endangered, which is the highest category of endangered species in the IUCN Red List of Threatened species.

Table 7 - Threatened Reptile species in Sierra Leone listed on IUCN Red List and their habitat specificity. Source: RAP-SL (2015).

English and Scientific names	IUCN Status	Main Habitat
Leatherback Turtle *Dermochelys coriacea*	VU	Coastal/Marine
Hawksbill Turtle *Eretmochelys imbricate*	CR	Coastal/Marine
Loggerhead Turtle *Caretta caretta*	EN	Coastal/Marine
Olive Riddle Turtle *Lepidochelys olivacea*	EN	Coastal/Marine
Green Turtle *Chelonia mydas*	EN	Coastal/Marine
Senegal Flapshell Turtle *Cyclanorbis senegalensis*	NT	Forests
Slender-snouted Crocodile *Mecistops cataphractus*	CR	Wetlands
Dwarf Crocodile *Osteolaemus tetraspis*	VU	Riparian forest
Gray's Monitor *Varanus olivaceus*	VU	Closed forest
African Softshell Turtles *Trionyx trunguis*	DD	Forest

The amphibian diversity (toads and frogs) comprises five endangered species, one vulnerable species, 13 near threatened species and seven species considered as data deficient. There are 13 species of frogs and 42 species of toads. One frog species, *Cardioglossa aureole (*new name *Arthroleptis aureole*) is endemic to West Africa, with records from the Western Area Peninsula Forest and Bumbuna Watershed. One toad species *Amietophrynus cristiglans*, which is also endemic to the region, occurs in the Tingi Hills Forest Reserve. Comparatively, amphibians are the most threatened groups with nearly 50% of the total number of species placed in one threatened category or the other (Table 8).

Table 8 – Threatened Amphibian species in Sierra Leone listed under IUCN Red List 2017 and their habitat specificity. Source: RAP-SL (2015).

English and Scientific names	IUCN Status	Habitat
Freetown Long-fingered Frog *Arthroleptis aureole*	EN	Forest
Togo toad *Amietophrynus togoensis*	NT	Riparian zone
Sierra Leone Reed Frog *Hyperolius chlorosteus*	NT	Forest
Ukami Reed Frog *Hyperolius torrentis*	EN	Forest
Wermuth's Reed Frog *Hyperolius wermuthi*	NT	Riparian zone
Nimba Reed Frog *Hyperolius zonatus*	NT	Forest
Chochran's Running *Frog Kassina cochranae*	NT	Riparian zone
Big-eyed Forest Tree Frog *Leptopelis macrotis*	NT	Degraded Forest
Sierra Leone Water Frog*Odontobatrachus natator*	NT	Riparian zone
Ringed River Frog *Phrynobatrachus annulatus*	EN	Riparian zone
Allen's River Frog *Phrynobatrachus alleni*	NT	Forest
Guinea River Frog *Phrynobatrachus guineensis*	NT	Forest
Liberia River Frog *Phrynobatrachus liberiensis*	NT	Forest
Tai River Frog *Phrynobatrachus phyllophilus*	NT	Forest
Sierra Leone Grassland Frog *Ptychadena superciliaris*	NT	Forest
Allen's Slippery Frog *Conraua alleni*	VU	Forest
Tingi Hills Frog *Amietophrynus cristiglans*	DD	Forest
Ptychadena arnei	DD	Forest
Mascarene Grass Frog *Ptychadena mascareniensis*	DD	Savanna
Sierra Leone Grassland Frog *Ptychadena superciliaris*	NT	Savanna
Ptychadena pujoli	DD	Savanna
Grass Frog *Ptychadena retropunctata*	DD	Savanna
Angel's Caecilian *Geotrypetes angeli*	DD	Degraded Forest
Beautiful Squeaker *Arthroleptis formosus*	EN	Forest
Hylarana occidentalis	EN	Closed Forest



Fish and marine invertebrates

Much of the study on marine biodiversity in Sierra Leone, particularly fish, have been undertaken at the Sierra Leone River Estuary (SLRE) (Longhurst 1958, 1965, Sentengo and Ansa-Emmin 1986), where up to 80 species have been identified. Fish productivity in Sierra Leone is not exactly known, but based in data from some studies (Blabber, 1997; Baran, 2000) fish production in the estuaries is between 3,855 and 4,144 million tonnes per year.

The benthic fauna is a rather diverse group that has been the subject of investigations for several years (Longhurst 1963, Williams 1968, Williams 1969, Nieland 1982, Sentengo and Ansa-Emmin 1986, Anyangwa 1988, Coutin 1989). The dominant members of this group are the Clupeidae (*Ethmalosa fimbriata*, *Sardinella maderensis*, *Ilisha africana*). Others include: Carangidae (some species may make periodic incursions into the estuary at high tide) and *Chloroscombrus chrysurus*;*Decepterus rhonchus* and *Trachurus tracea*; Tetraodontidae (*Lagocephalus cephalus*, *Liza falcipinis*), Sphyraenidae (*Sphyraena barracuda*), *Pristis pristis*; and Dasyatidae (*Dasyatis margarita*).

The inshore demersal stocks include mainly the Sciaenid assemblage, which live above the thermocline on shallow muddy bottoms. Although some 60-80 species have been identified in this community, only a few species are dominant, including *Pseudotolithus elongatus*, *Drepane africana*, *Cynoglossus goreensis*, *Arius lasticutus* and *Dasyatis maragaritu*. Among the inshore pelagic species, the most important species are the Clupeids (*Ilisha africana*, *Ethmalosa fimbriata*, *Sardinella maderensis* and *Sardinella aurita*), the Carangids and the Scombrids. These fish categories are mainly migratory and closely related to the fluctuations of the environmental conditions within the estuaries and near-shore.

The offshore pelagic fisheries consist mostly of species associated with three types of hydrographic regimes. *Engraulis encrasicolus*, *Sardinella aurita* and Decapterus species are found associated with the thermocline. *Scomber japonicus* and *Trachurus* spp are found in the upwelling zones. Tuna species are also found in this zone, which include: Yellowfin tuna (*Thunnus albacares*), Skipjack tuna (*Katsuwonus pelamis*) and Little tuna (*Euthynnus alletterates*). This community consists mostly of demersal fish species. It is diverse but in terms of abundance it is dominated by Sciaenidae. The prominent members of the Scianidae are *Pseudotolithus elongatus*, *P. senegalensis*, *P. brachygnatus*, *P. typhus*, Plynemidae (*Galeiodes decadactylus*, *Pentanemus quinquarius*, *Polydactylus qadrifilis*), Drepanidae (*Drepane africana*), Monodactylidae (*Monodactylus sebae*), Pomadasyidae (*Pomadasys jubelini*, *P. peroteti*), Lutjanidae (*Lutjanus goreensis*).

The offshore demersal fishers include the spared fauna of the continental slope community and shellfish. The spared fauna normally inhabits the regions below the thermocline on sandy and rocky bottoms. The shallow shelf Lutjanidae sub-community is dominated by the

species *Balistis capriscus, Pagellus bellotti* and *Dentex canariensis*. The deep shelf spared community includes *Dentex* sp and *Pendtheroscusion* sp.

The continental shelf edge community inhabits depths between 200–300m and is dominated by the genera*Bembrops* and *Antigonia*. The continental slope community, which includes the genera *Gleus* and *Citta*, are found below 400m depth. As a matter of convention shrimps and crabs of estuaries and deltas are also included here. Only three (*Penaeus notialis, P. atlantica* and *P. kerathurus*) out of six species of shrimps are found in the coastal waters of Sierra Leone. The species of crabs of commercial importance found in the SLRE are the entire genus Callinectes; *Callinectes pallidus, C. amnicola* and *C. maginatus*.

The crustaceans and molluscs consist of the shrimps, cuttlefish and squid. Of the six shrimp species of commercial importance *Penaeus notialis* accounts for about 96% of the landings and occurs of the Freetown peninsula especially around Banana Island. *Penaeus kerathurtus* occurs in the southern part of the coast. Both species inhabit the mangrove swamps, estuaries and inner continental shelf to a depth of 55m. Other species occur in deeper waters of 40-70m and above the continental slope. The inner shelf shell fish populations are assessed to be in good but declining condition.

In freshwater ecosystems, 16 families of fish comprising about 100 species have been identified.The major fish species *include Alextes longipinnus, Epiplatys fasciolatus, Hepsetum odoe,Sarotheodon kingsleyi, Ctenopoma kingsleyi, Polypterus palmos, Hemichromis fasciatus, Tilapia sp., Clarias lazera, Clatias laevicps* and *Mormyrus macrophaalus.* There are also several species of catfish (*Bagrus bayad, Synodontis nigrita, Clarias platycephalas, Clarias lazera* and *Chysichthys furcatus*) found in lakes, rivers and lagoons (Payne, 1986). Although the practice of aquaculture has huge potential as a profitable commercial enterprise, it is limited and fish species such as Tilapia, Mullets (Mugi and Liza), Claris, Chrysichthys, Penacus and Scylla are the commonly used feeder stocks.

Butterflies

Two endemic species of dragonfly, *Argiagrion leoninum* (EN) and *Allorhizucha campioni* (EN) occur, and the African swallowtail butterfly *Papilio antimachus* (DD) reaches its westernmost limit in Sierra Leone. Systematic study of butterfly diversity and distribution has only been carried in four key locations – Gola Forest, Loma Mountains, Bumbuna area and the Western Area Peninsula Forest. These studies have shown that some 50 butterflies' species in Sierra Leone are endemic to West Africa or to the Liberian sub-region. Not many of these species are listed in the IUCN Red List, but the following are worth mentioning as species that are endemic with rare occurrences in the country: *Papilio horribilis, Neurellipes staudingeri, Charaxes nobilis claudei, Euphaedra aberrans, Euphaedra afzelii, Acraea vesperalis, Melphina maximiliani* and *Kedestes protensa.* The pictures of three butterfly species are shown in Figure 6; the one on the right is used as the logo of the NPAA.

Figure 6 – Three beautiful butterfly and moth species in Sierra Leone

Sierra Leone's Protected Area Network

The history of Sierra Leone effort in the conservation and management of natural habitats in dates back to the 19th century and the Forestry Department was constituted in 1911 to protect and conserve the dwindling forests in the country. To date about 29 forest reserve are under one level of protection or the other, the largest tract being the Gola National Park. The protection of natural non-forest came into prominence in 1995 with the gazettement of the Outamba-Kilimi National Park, in the north of the country, which is the largest portion of savanna ecosystem currently under protection. Four Marine Protected Areas (MPAs) were declared in 2010 as significant component of the protection of coastal and marine ecosystems.However, due to the relatively higher premium given to forest conservation and the low level of awareness about the importance of wetland biodiversity, the development of policies and legislations to protect wetlands has been slow.

Prior to 2012, the Forest Division, MAFFS was responsible for managing protected areas and the wildlife they hold. The passing of the National Protected Areas and Conservation Trust Fund Act 2012, brought into being the National Protected Areas Authority (NPAA). The Wildlife Conservation Act of 1972, which has been reviewed and awaits parliamentary enactment, makes provision for the establishment of the different categories of protected areas. In the reviewed draft of the Act, the nomenclature of protected areas in the country has been made consistent with internationally recognised protected areas system, depending on the degree of protection conferred on a site.

As dictated by the Act that created it, the NPAA is now the agency responsible for implementing all other Acts and related instruments geared towards the conservation of

biodiversity, particularly the Wildlife Conservation Act. Other instruments, like the Forestry Acts (a draft review now available) and the draft Wetlands Act, have elements that overlap with the responsibilities of other agencies; their implementation would require collaboration with the relevant government MDAs. The agency is also mandated to encourage and establish co-management arrangements and collaborative ventures with local communities and the Forestry Division, respectively including ecotourism and sustainable exploitation of biodiversity components.

According to data from Allan (1990) and Mnzana (1992), the national forest estate had an area of 610,122ha (8.4% of the total land area of Sierra Leone) comprising national parks (74,800 ha), non-hunting forest reserves (360,622ha), and game reserves and game sanctuaries (60,100ha). Table 9 provides data on the major designated protected areas and their sizes. In total there are 29 forest reserves, a significant number of which have been upgraded for higher protection categories across the country.

Table 9 - The Major Components of the Forest Reserve Estate in Sierra Leone, their respective sizes and region where they occur.

Protected Terrestrial Forest	Size (ha)	Province
Gola National Park	77,044	East
Tonkoli Forest Reserve	47,656	North
Loma Mountains National Park	33,200	North
Kambui Hills Forest Reserve	21,213	East
Dodo Hills Forest Reserve	21,185	East
Western Area Peninsula Forest NHFR	17,800	West
Tama Forest Reserve	17,094	North
Nimimi Hills Forest Reserve	15,557	East
Tingi Hills Forest Reserve	11,885	East
Kangari Hills Forest Reserve	8,573	South
Kuru Hills Forest Reserve	7,001	North
Kasewe Forest Reserve	2,333	North
Moyamba Hills Forest Reserve	ca4000	South
Total size	285,000	

The following elaborates the degrees of protection offered by the different categories of protected area status, as stated by the 1972 Wildlife Conservation Act:

Strict Nature Reserve

This is the highest level of protection for biodiversity provided by the Wildlife Conservation Act and it covers all forms of wildlife (flora and fauna) and the land form in any designated area. A nature reserve may also be set within other protected areas such as a forest reserve or national park. No hunting and extraction is allowed and entry is restricted for scientific purposes only. Settlements and unauthorised activities are completely restricted within

reserve boundaries and a one-mile width buffer zone surrounding the nature reserve is marked out to prevent encroachment. There is currently no strict nature reserve in Sierra Leone but there are two proposed areas within Gola North forest reserve, which is now part of the Gola National Park.

National Park

A national park is established for the purpose of propagating, conserving and managing wildlife and wild vegetation as well as protecting sites, landscapes or geological formations from damage or injury. It is also maintained for the scientific and aesthetic value to the general public. Access is given only to visitors and researchers. Hunting and capture of wild animals and the taking of forest products are strictly prohibited, as defined in the Forestry Act. Agriculture, mining, dam and housing constructions are also prohibited, unless authorised. The gazetted national parks are Outamba-Kilimi NP, Gola Forest NP, Loma Mountain NP and Western Area Peninsula NP. There are proposals for Lake Sonfon and environs, Lakes Mape and Mabesi to be upgraded to national park status.

Game Reserve

In a Game Reserve, strong protection is specifically offered for fauna requiring special protection. Most of the conditions and prohibited activities in National Parks and Strict Nature Reserve also apply to a Game Reserve. Tiwai Island adjacent to the Gola Forest complex, in the Moa River, has been managed through collaboration between conservation agencies and the local communities, with support from United States conservation agencies. The Biological Sciences Department of Njala University and Environmental Foundation for Africa are the key local partners in the management of the sanctuary.

Game Sanctuary

This category of protection is offered for a unique ecosystem, usually at the request of a Chiefdom Authority. The hunting and trapping of animals are not allowed. Management of the sanctuary is usually in the hands of the local communities, agencies and scientists working in the area usually provide technical support. Mamunta-Mayosso is currently the only Game Sanctuary in the country.

Non-hunting Forest Reserve

In this category the hunting and capture of animals in all designated reserves are strictly prohibited, except permitted by the Director of Forestry. Extractive activities such as logging and woodcutting are only permitted under strict conditions as authorised by the Director of Forestry. At present only Kangari Hills and Tingi Hills are gazetted non-hunting. The two others (WAPF and Loma Mountains) have been upgraded to national park status.

Forest Reserve

In a forest reserve limited protection is offered to wildlife within forest reserves since hunting of certain species is permitted under licence. There is a prohibition on the hunting of elephants, chimpanzee and any other threatened or rare animals that have special protection. However, but permission for hunting and capture of wildlife may be given by the Director of Forests for special reason such as research. A forest reserve may be kept for protection and/or production as declared by the Forestry Act. There are about 24 forest reserves in the country, including the Gola Forest and Kambui Hills.

Special Protection for animals

The 1972 Wildlife Conservation Act declared special protection for threatened animals as listed in the following categories:

a) ***Prohibited animals*** - This category provides absolute protection of animals from any form of exploitation, including all species listed as threatened by the IUCN (critically endangered, endangered, vulnerable and near threatened species) and all species listed in CITES appendices. See previous subsections for detailed list of threatened species in Sierra Leone.
b) ***Protected animals*** - This category provides protection specifically for the young of some species of antelope species, chimpanzee, all Cercopithecoid monkeys, all *Manis*species and the Hyaena *Crocuta crocuta*. License may be issued to hunt the adults of some of the species mentioned if and when the need arise, such as curling to reduce population in situation where human life and property may be threatened by the species.

Pressures on Sierra Leone's Biodiversity

Habitat destruction and degradation factors

Habitat destruction and degradation is the most potent threat to biodiversity in Sierra Leone. Biodiversity in Sierra Leone has been subjected to serious threats, both direct and indirect. The most obvious threats include habitat loss and fragmentation of natural habitats due primarily to deforestation, wetland drainage and infrastructural development, overgrazing, poor mining practices, poor farming practices, inappropriate use of agrochemicals, pollution, bush fires, population pressure, civil conflict, poverty, illiteracy, lack of resources, limited trained human power, inappropriate policies, institutional weakness as well as socio-economic factors. The following is a description of various forms of threats to biodiversity from habitat destruction and degradation:

Agriculture

The nature of agriculture that has been practiced for centuries in the country is slash-and-burn shifting cultivation, which is considered by the Inter-governmental Panel on Climate Change (IPCC, 2007) as one of the biggest threats to global biodiversity. In fact, it has been estimated that slash-and-burn agriculture is one of the main factors responsible for the depletion of the country's forest ecosystem to less than 5% its 1900 cover. Consequently, closed forest formations only occur as fragments of habitats mainly in forest reserves, a majority of which are found in the east to south-eastern sector of the country. From data, forest-dependent species constitute the highest proportion of species in the country and so any significant threat to the forests will affect biodiversity.

Agriculture-related habitat destruction is very widespread in Sierra Leone (Figure 7), restricting the habitat availability and distribution for some species, resulting in limited species dispersal capacity and restricted gene flow that constitute the tools for evolution and speciation. The state of such ecological processes have been worsened by declining fallow periods resulting from the growing rural population, increasing cost of living and lowering crop yield. Studies by Gleave (1996) and Okoni-Williams (2013) indicate that fallow periods have declined from over 15 years to an average of less than seven years in one to two generations and that the local farming communities view fallow agriculture (or shifting cultivation) as becoming increasingly challenging with lowering crop yields over time.

Figure 7–Extensive deforestation for agriculture on the hills around Bumbuna Hydro-electric Project watershed area

Crop production is the major contributor to GDP from agriculture (Figure 8). The production of rice, the staple food, is the key output of fallow agriculture. Traditionally, rice dominates the crops contribution to GDP with the average of over 15%, followed by cassava at 9.3 %(ICADEP 2014). In order to enhance productivity, upland rice cultivation, which supplies a vast proportion of the food demand, is preferably done in plots where old secondary regrowth occurred, and have accumulated much nutrient over time. This is depleting huge tracts of secondary forests every year whilst the spate of deforestation is increasing with increase food demand to cope with the growing rural population and

demand for modern lifestyles. Also, the traditional burning of vegetation during the phase of land preparation for agriculture is increasing emission of carbon-dioxide into the atmosphere, which is one of the major drivers of climate change.

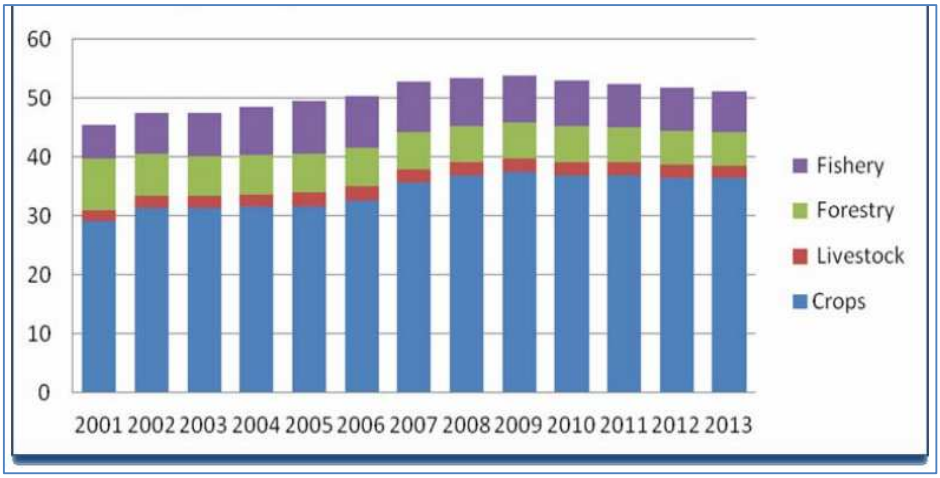


Figure 8 - Proportion of Agricultural Sub-sector Contribution to GDP. Source WB, DTSI, 2013.

Over the years, as the land availability becomes limited by the growing population and traditional governance system, anecdotal evidence show that the farming system has changed from a traditional shifting cultivation (wherein the farming village moving from one location to another to farm) to a more sedentary fallow mechanism (wherein the village remain in one location and the farming plots rotated). Of the national land area, 5,360,000ha (approximately 74%) are arable, of which 80% constitute upland ecosystems (NRDS, 2009). Furthermore, the NRDS (2009) report postulates that agricultural productivity needs to increase significantly, if incomes are to be enhanced and poverty is to be reduced in Sierra Leone. Given the limited scope for expansion of the area under annual crop production using the traditional upland bush fallow system, most of the productivity increases must come from increases in yields, resulting from adoption of new technologies by the small-scale farmers who produce the bulk of agricultural output.

Considering that rice is the nation's staple food and thus its major agricultural product, the NRDS (2009) identified two strategies for increasing rice production, namely: (a) increase in area cultivated, mainly in the lowlands where there is much under-utilized capacity, and (b) increase in productivity per unit area in all ecosystems. In order to realize the Government's goal to achieve rice self-sufficiency by 2013, the NRDS targeted a land area of 830,000 ha, and an increase in the average rice yield/ha to 2.0 mt/ha. This has the tendency of increasing the pressure on forest and pristine habitats.

A recent disturbing phenomenon is the conversion of vast areas of species-rich agro-ecosystems into monocultures for the cultivation of sugar cane and oil palm used for biofuel production. This is mainly driven by investment from multinational companies to satisfy the growing need for environmentally-friendly low-carbon emitting fuels. The largest of such investment is the Socfin Oil Palm Company in the Pujehun District, which covers an area of about 15,000 ha. Others include Gold Tree (oil palm) in the Kenema District, Miro (agroforestry) in the Tonkoli District and Addax (sugarcane) in the Bombali District. However, such ventures have been shown to be counterproductive, as they are creating serious pressure on biodiversity, worsening the land hunger among local farming communities, and reducing indigenous agro-biodiversity, thereby increasing pressure on pristine ecosystems, particularly forests that support a most of the country's biodiversity.

Wood fuel extraction and logging

Wood fuel (wood and charcoal) is estimated to account for a very high proportion of domestic fuel needs in Sierra Leone. In combination with logging and pole extraction, wood-fuel production is now a leading cause of habitat degradation in various ecosystems, including closed forest, woodlands and mangroves. Many species that depend on these ecosystems are threatened because such activities degrade the micro-ecological integrity of their habitats, distorting their feeding, foraging and breeding activities. In response, some species tend to retreat into deep areas in closed forests or other pristine habitats where they could find suitable alternative habitats for survival. However, for some species, with delicate and rare microhabitat requirement, any distortion could be disastrous to their local populations.

The rate of wood, charcoal and log production is so high nowadays that the rate of habitat recovery is hardly keeping pace with the rate of depletion. The recent introduction of the power-saw into wood processing for logs and charcoal is a very potent factor that is accelerating the destruction and degradation of forests. As a result there is always a tendency to extend wood extraction into pristine areas and reserves. Although logging can sometimes be selective, the increasing demand for building poles and logs is causing indiscriminate extraction in recent times.

Figure 9 - *Pterocarpus erinaceus* processed wood staked and being transported to the Freetown port for export.

Forest tree species have been the main target of logging companies and private loggers, but now the extraction of species like *Pterocarpus erinaceus*(Figure 9) and *Lophira lanceolata* is devasting woodland habitats in northern Sierra Leone, including areas in and around the Outamba-Kilimi National Park and Lake Sonfon.

Unbridle urbanisation and development

The accelerated rate of population increase coupled with rural to urban migration in the country, have over the last two decades necessitated the expansion of housing in towns and cities throughout the country. The situation was exacerbated by the 1991 – 2001 civil war during which large numbers of rural inhabitants migrated to safer areas in main towns and cities. Consequently, the numbers and sizes of slums increased, whilst unplanned housing construction in vulnerable areas escalated, putting great pressure on the natural support systems and resources and almost permanently obliterating the natural ecological systems of these locations. Some of these areas were forests and intertidal coastal systems that use to support a diversity of both terrestrial and aquatic birds, respectively. One typical example is the proliferation of housing on the previously forested hills overlooking the city of Freetown, which use to hold significant number of wildlife species. Another is the expansion of settlements along the Freetown estuarine coast, where large numbers of migratory waterbirds used to visit, particularly the Aberdeen Creek (Figure 10).

Figure 10 – Destructive settlement expansion at Aberdeen Creek, due to unbridled urban development

Bird numbers have declined significantly as a result of changing ecological conditions in these sites as with many other sites in the country. Both hillside and coastal erosion events are causing serious sedimentation of once productive coastal habitats important for bird feeding and roosting activities of migrant birds. Erosion along river banks is clogging river

courses and destroying vital riparian habitats thus fringing aquatic wildlife. For instance, over a period of 21 years, the number and abundance of water bird species at the Aberdeen Creek declined significantly (Fig. 11). This creek is a typical example of a once viable habitat that has been degraded by threats from various anthropogenic sources, including mangrove clearing, sedimentation, unbridled development and over-exploitation of fish and molluscs.

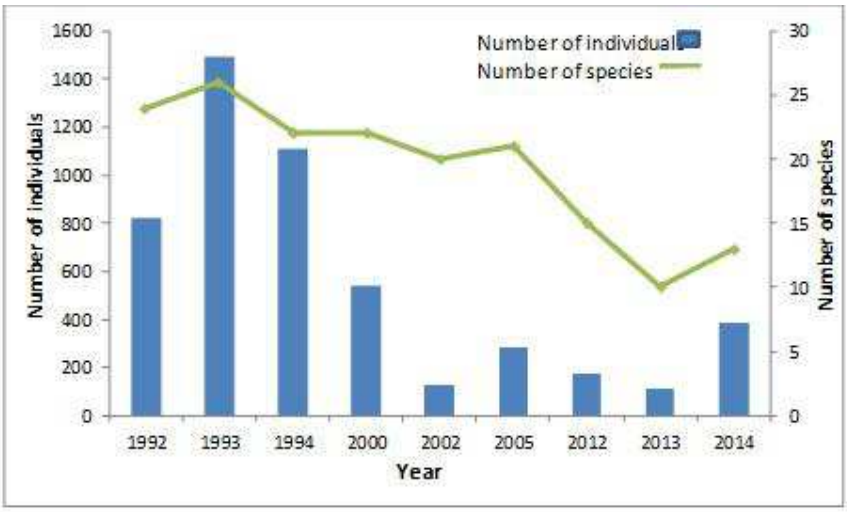


Figure 11 - Trends in waterbird number since 1992. The decline in bird species and abundance has been associated with habitat degradation resulting from mangrove depletion, land reclamation and housing construction. Source - Okoni-Williams et al. (2015)

Mining

The deleterious effect of mining on the environment and biodiversity is glaring and this is evident in many areas in the country. Mining contributes an average of about 4 to 10% of the country's GDP (depending on the quantity of minerals mined and the global market price), and provides among the highest private sector employment in the country. The production of iron ore by two large mining companies between 2008 and 2012 was the reason for the dramatic growth in the country's GDP, up to about 20% in 2013. However, by all indications, mining constitutes one of the most significant threats to biodiversity today. Huge areas of land are being deforested and degraded in various parts of the country, resulting from various mining operations. In Kono, large portions of land have been left to waste following diamond mining. In Mokanji and Rutile, huge areas of land and vegetation are degraded through bauxite and rutile mining, respectively; whilst in Ferrengbiai and Lunsar, similarly destructions are happening as a consequence of iron ore mining. The destructive nature of the mining and the dumping of mine tailings (Fig. 12) is rendering many viable habitats ecologically redundant, as in most instances, mine tailings are inert and support little or no wildlife.

Artisanal is destroying viable habitats and riparian ecology of a number of floodplains, estuarine, river and streams systems around the country. Vast areas of riparian zones and flood plains have been devastated by unregulated artisanal gold and diamond mining, whilst

illegal zircon mining threatens the ecology of some parts of the coast. A general observation from various field surveys show that birds that depend on riparian ecologies (such as kingfishers, crakes and ducks), were absent from river systems in the east of the country that have experienced years of sedimentation from both artisanal and industrial mining activities. Sand mining, which is generally artisanal, is creating huge localised disturbances to natural aquatic habitats along some sections of the coast (particularly around the Freetown peninsular) and along some of the major rivers and tributaries.

Figure 12 - Huge dumps of inert tailings dumped at the iron ore mines in Lunsar after the extraction of the ore.

Natural factors

Climate Change

Climate change has become one of the most important discussions in international agenda on the environment. It is a natural phenomenon that has been scientifically proven to be accelerated by human activities, and has been blamed for a number of extreme weather conditions, including floods, heat waves and bush forest, with devastating consequences on people and nature. A report by Karim and Okoni-Williams in 2007 for the National Adaptation Programme of Action (NAPA), indicates that climate change has the potential to distort a range of ecosystem processes that may lead to permanent changes to bird diversity and bird habitat in future.

Although the evidences are not immediately apparent, the long dry spells with intense solar heat and the changes in annual precipitation period coupled with irregular strong winds and heavy rainfall are enough signs of changing climatic conditions that may affect birds and their habitats. As birds are considered indicators of ecological change, it follows that such changes in ecological conditions is affecting a significant diversity of flora and fauna. Rising sea levels is depleting habitats for birds and other coastal/marine wildlife along sections of the coastlines of the Sierra Leone River Estuary.

A typical example of the possible effect of climate change is provided in a picture shown in Figure 13 (source: Okoni-Williams et al., 2015), where within a period of few months to a year, rising sea level eroded the sandy beach, banks and fringing vegetation depleting vital habitats for birds, wildlife and human settlement. It is also suspected that climate change is now accelerating the rate and intensity of sea weed invasion unto the beautiful beaches along the coast between July and September each year, obliterating their scenery. These beaches are not only used for leisure and fish productivity, but are among the most attractive destinations for both local visitors and international tourists, and contribute significantly to local and national economy. In the forest and woodland environments strong winds and wild bush fires are destroying trees and viable habitats for biodiversity.

Introduction of invasive and exotic species

Invasive exotic species are known to create serious ecological imbalances and threaten indigenous biodiversity, because they are hardly faced with natural enemies, competitors and predators in their new environment. There are numerous instances of the effect of invasive and exotic species on local biodiversity including local and global extinctions as exemplified by the extinction of the dodo on the island of Mauritius mainly due to the introduction of predatory species into the island by humans. Most such introductions are not deliberate and their effects are gradual, but potent and lasting, and are likely to create permanent damage to the environment and local biodiversity.

A very potent threat to Sierra Leone's biodiversity is the proliferation of both alien and local exotic species, which are slowly, but surely becoming invasive and are destroying local ecologies. Invasive species include plants (such as *Chromolaena odorata*, *Acacia mangium* and *Acacia auriculiformes*) and animals (particularly invertebrate pests – e.g. cassava millibug) that are becoming troublesome to the natural ecosystems, agricultural systems and crops.Anecdotal observations show that the cockroach species *Periplanatus america* (introduced through second-hand household goods), appears to eliminate the local species *Blatta occidentalis*wherever their habitats overlap.*Chromolaena odorata*(Figure 14) is a shrub that exists as a noxious weed in many upland ecosystems including farm bush and every other available inch of clearing and preventing the growth of other vegetation. It is often referred to as the "rebel weed" among some local communities.

Figure 14 – Picture of the invasive "rebel weed" *Chromolaena odorata* spread over the entire space of a fallow plot in northern Sierra Leone.

Direct off-takes and Wildlife Harvesting

Direct off-takes refer to the taking of wildlife either dead or alive from their natural environment. The practice was done through subsistence hunting and trapping and historically allowed for natural recovery of wildlife, but presently, the association of the trade with trafficking and economic gain, has made it deleterious to wildlife populations.

Wildlife trafficking

Anecdotally, wildlife trafficking is becoming a serious threat to Sierra Leone's biodiversity. The wild bird trade target species included estrilids, hornbills, grey parrots (Fig 15), orioles and starlings among others. The skins of most other species are the main reasons for hunting them,

rather than food. There are cogent evidences that the skins of pangolins, pythons and boars, crocodiles and the shells or turtles and tortoises are smuggled out of the country. Currently, the most significant threat from trade in wildlife trade and trafficking comes from cross-border activities through the Republic of Guinea, for live trophies, and to a lesser extent, Liberia, where monkey and other bush meat are delicacies.

Hunting and trapping

Hunting is a very widespread activity. Hunting using shot guns declined because of the general embargo on guns due to the civil war (1991-2001). However, trapping using snares is a widespread practice as it is very common to come across dozens of snares in a forest patch, for species of various sizes ranging from rodents to monkeys and buffalo. Local hunters mainly hunt for subsistence and almost all species of wildlife are targeted, including primates (chimps and monkeys). There are also isolated incidences of hunting and trapping of threatened birds like White-necked Picathartes, White-breasted Guinea fowl and a number of other forest-dependent species.

Specific threats to Biodiversity in the Aquatic, Coastal and Marine Ecosystems

The definition of the coastal zone used in this document is that defined by Clark (1990) as "all coastal areas that are subject to storm flooding by the sea, all intertidal areas of mangrove, marsh, deltas, salt flats, tide flats and beaches; all permanent shallow coastal water areas such as bays, lagoons, estuaries, deltaic waterway and near coast waters that include sea grass meadows, coral reefs, shellfish beds submerged bars; the near shore coastal waters and small coastal islands". In 1985, CSO stated that about 43% of the population of Sierra Leone lived within 10 km of the coast. Between 1991 and 2002 (during the rebel war), it is believed that as many as 60% of the population may have fled to safer areas on the coastline occupying more than 500 towns and villages.

Along the coast activities such as fishing, agriculture, industrial activities (textile, chemical, and brewing), mining and mineral exploitation, tourism, marine transportation, marine and coastal infrastructure, waste deposition(both industrial and domestic) are bound to be on the increase. The control and management of these activities would require huge investment and appropriate infrastructure. Urbanization and development consumes resources heavily and generate huge quantities of waste (chemical and solid wastes). Increase in anthropogenic activities and introduction pollutant into the coastal zones affect the complex food web and ecological relationships thus adversely affecting the biodiversity. The bulk of pollutants entering the sea are derived from the following sources: runoff and discharges from the land mainly through rivers (44%); atmospheric sources (33%); marine transportation, spills and operational discharges (12%); deliberate dumping of wastes (10%); offshore development of mineral resources (1%). The following paragraphs provide some details of the specific threats to Sierra Leone's aquatic, coastal and marine biodiversity:

Over-exploitation

In Sierra Leone, there is evidence of over-exploitation of certain categories of target species and significant reduction in others in response to growing demand and population growth. Out of seven major snapper species, five (*Dentex angolensis, D.congensis, D. Canarensis, Pagellus belloti* and *Sparus caeruloesticus*) have been shown to be declining rapidly (Showers, 1996). There is evidence of over-exploitation of the following species: *Pseudotolithus senegalensis, Drepane africana, Galeoides decadactylus, Dasyatis margarita* (Coutin, 1989; Fomba, 1996). *Ilisha africana* is the only pelagic species known to have been over-exploited (Ndomahina and Chaytor, 1991).

The shrimps have reached the maximum sustainable yield levels of 3,000 mt (MFMR, 2002). Generally gill netting, purse seining (Fig. 16) and bottom trawling discriminate poorly between target and none target species. Bottom trawling can cause considerable mortalities among benthic organisms such as molluscs, crustacean, hydrozoans, bryozoans and echinoderms. In Sierra Leone about 70% of the total landings from the shrimping sector consist of finfish by catch. Both shrimp and finfish trawlers discard about 50000 mt and 3000 mt of finfish by catch amounting to 3% and 11% of the total annual catch respectively (Cole, 2000; Kanu, 2001).

In the artisanal sector large proportions of juveniles of valuable species such as *Ethmalosa fimbriata, Sarda sarda, Caranx and Polydactylus quadrifilis* are landed by gill nets and beach seines (Figure 16). In recent times 2002 there are about 150 beach seines compared to some 20 in 1995 in the Western Area. Okera, 1978, recorded 64 species of fish landed at Lumley beach. Today, there are not more than 40 species recorded annually. Poisons and explosives are prohibited by law but are widely used especially in rivers and estuaries. Artisanal fishermen are noticing a drop in their catches.

Agriculture and Forestry

In the coastal areas, mangrove swamps especially in the North are cleared for rice production. Fomba (1994) estimated that 35,000 ha in the North and 5,000 ha in the South are under cultivation. Mangroves are used as fuel wood, for charcoal production, and construction material. Mangrove swamps and wetlands are bound to be put under further pressure leading to habitat destruction and loss of biodiversity. Pesticides are also used to control of malaria, schistosomiasis and onchocerciasis. Pesticides are also used to control pests of rice. Oil palm plantations such as Biopalm Oil Star, West Africa Agriculture, Socfin Oilpalm and Miro Forestry Company Limited are all using chemical fertilizers. These fertilizers are dangerous when they reach the aquatic and marine environment. These are washed up through erosion and run-off into rivers and sea. Also, sugar plantation owned by ADDAX Bioenergy Company is also contributing to the level pollution in the Rokel River.

Industrial activity

About 95% of all industries in the country are located in Freetown. Among these are the Petro Jetty (Fuel Oil) Company, Sierra Leone Brewery, Whitex, Shakandas, Milla Group of Companies, Aureole Tobacco Company and Paint Factories, among others. Effluents and spillages from these factories are discharged directly into the Sierra Leone River Estuary. There are plans to extend the operations of the industries into the hinterland and coastal areas including Pepel and Bonthe Island.

Coastal transportation

On the average there are about 50 industrial fishing vessels today. It is estimated that there are over 2,000 artisanal fishing boats of which 950 are motorized. There are an estimated 450 motorised Artisanal cargo boats. The Sierra Leone Ports Authority handles on the average 300 vessels annually. The increased demand on the transport sector has lead to the uncontrolled importation by the private sector of a large number of second hand modes of transportation often fitted with low performance engines. The private sector also continues to import all sorts of grades of fuel and lubricants to service this rather expending but inefficient and poorly managed sector.

Vehicular and coastal marine transport emits gases such as sulphur oxides, nitrogen oxides, carbon monoxide and heavy metals. Power plants of ships and industrial vessels do not only emit noise and thermal energy but also emit significant levels of metals. Burnt oil, bilge and ballast water may be discharged at sea. Garbage including glass and plastics are often thrown overboard by the crew. Antifouling paints, lead and acid from batteries and burnt oil from workshops eventually enter the sea. Exhaust pipes emit carbon dioxide and other gases into the atmosphere.

Mining and Mineral Exploitation

The main minerals mined in Sierra Leone are Iron ore, sand gravel, rocks, gold, diamond bauxite Zircon and rutile. Because of the construction industry and coastal infrastructural development sand and other building materials are in great demand. As part of IMBO programmes, Mansaray, (2001), estimated that the quantity of sand removed from Lakka Beach over a 10-day period in August and September 2001 amounted to 6,420 tons. Mining alters the coastline and discharges silt and mineral water into the coastal zone. Rocks on rocky shores with their rich biota are quarried also for construction.

Electric Power Generation

Because of the large quantities of water required for power generation, hot water or thermal effluent is usually discharged into the sea by coastal stations. Kingtom and Falconbridge stations in Freetown and Nitti and Bonthe stations are found in the Sierra Leone River Estuary and the Sherbro estuaries respectively. Deliberately discharging burnt oil or through accidents involving storage silos could be injurious to the environment.

Tourism

Sierra Leone's coastline is made up mostly beaches and mudflats. Tourism is bound to be on the increase. There are tourist facilities at Lungi, Freetown Peninsula, Shenge, Bonthe and Turtle Island. Tourism requires land based infrastructure and coastal transportation. Tourism can lead to changes in flora and fauna, introduction of pollution, erosion, depletion of natural resources and increase litter. As many as 20,000 tourists are expected annually in the future.

Domestic Waste Disposal

Domestic waste comprises human wastes, laundry waste and solid waste (garbage). About 70% of all households in Freetown and big towns use pit latrines. About 20% have cesspits and 10% use rivers, coastlines and the bush. In the smaller settlements 80% of the inhabitants use the beaches as toilets. In Freetown sewage from pit latrines and cesspits are only partially treated and discharged into the sea. In addition untreated sewage is discharged directly into the Sierra Leone River Estuary through four main sewer lines or outfalls (Murray Town, Kingtom, Government Wharf and Cline Town). Each of these outfalls is found close to certain bays and creeks: Aberdeen, Whiteman's bay, Kroo Bay and Cline bay. Solid waste collected in Freetown is disposed of at two dumpsites: Granville Brook and Kingtom. At Granville Book, about 66,607kg of solid waste is deposited every month (Nyuma, 2000), but this estimate may be significantly higher now. Some part of these wastes is eventually washed out to sea. Coastal populations deposit their solid waste on the beaches.

Marine and Coastal Infrastructure

Almost all coastal activities require some amount of infrastructural development. Many tourist concerns have built hotels, guest houses and environment centres close to the coast. There are possibly more than 50 such centres along the entire coast. Other activities may include construction of silos, pipelines and jetties. Regular be channelization, dredging and

filling occur at the three major ports (Queen Elizabeth II Quay, Pepel, and Nitti). The World Bank funded rehabilitation of over 30 landing facilities and may construct more.

Summary analysis of threats to Sierra Leone's biodiversity

The short threat analysis given below is based on the application of a simple multi-criteria ranking technique (SMART) on the effect of various human activities on biodiversity, using birds as a key indicator. The *Fifth National Report to the CBD* has details of the SMART analysis used. The identified threats factors were first ranked in terms of their relative importance using a factor of five as the most important and one as the least importance. A threat is considered most important if its local application is very injurious to both the species and its habitat, whilst considered least important if its effect is limited. For example, agriculture is scored five because its effect is widespread, removes and destroys the habitat and eliminates or drives away the species. In some cases the potential future destructive effect is considered as in the case of climate change. The graph in Figure 12 indicates the relative effect of the potent threats identified and quantitatively assessed.

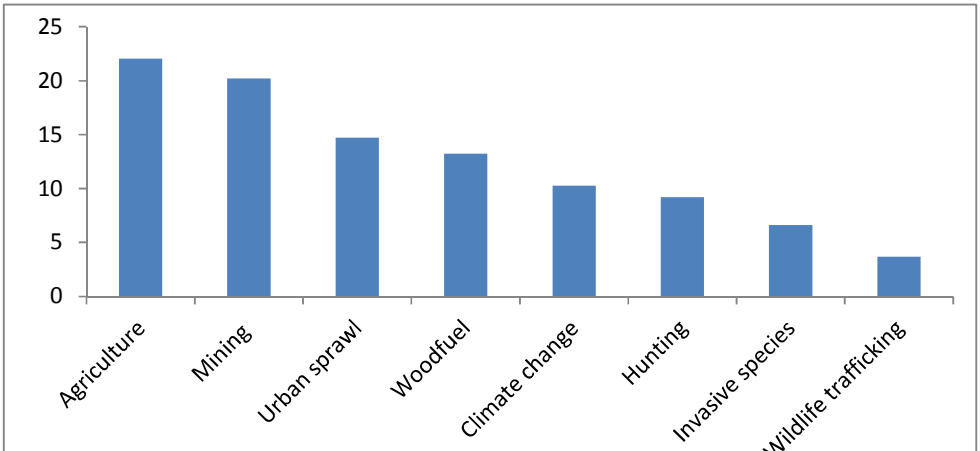


Figure 17 - Relative effects of known threats to biodiversity in Sierra Leone

The graph puts agriculture as the most potent threat to biodiversity; this is primarily a result of the archaic and widespread method of slash-and-burn which dominates the agricultural system in the country. Although localised, mining is considered the second most destructive threat to biodiversity because of its devastating effect on vegetation, its effect on the ecology of the hydrological system, and the unproductive nature of its resulting landscape. Urban sprawl is presently one of the biggest challenges because of the rural-urban migration, mainly fuelled by the lack of employment opportunities in the rural areas. Climate change is ranked at the middle of the scale because it is yet to be fully understood, although some its presumed effects are already evident. At the lower end of the scale is wildlife trafficking and this is a consequence of the effective implementation of the Wildlife Conservation Act and CITES regulations.

Major Interventions - Ecosystem and habitat restoration programmes since 2004NBSAP

In-situ Conservation Interventions in Protected Areas

A number of conservation projects were implemented in protected areas in response to the planned actions in the NBSAP 2004-2010, some of which are detailed below.

Gola Forest National Park

Covering an area of about 70,000 ha, the Gola Forest is the largest remnants of Upper Guinean Tropical Rainforest left in Sierra Leone. A variety of other flagship species are found in Gola including the elusive and threatened Pygmy Hippo, *Choeropsis liberiensis* (EN), and only present in this part of Africa, an estimated population of 300 chimpanzees and 49 species of larger mammals. These species are only a few of those that drove the international recognition of this area as a global biodiversity hotspot, requiring utmost effort and attention from the conservation community. Its avifauna comprises over 330 bird species, 14 of which face global risk of extinction, including the endangered Rufous Fishing-owl *Scotopella ussheri*, the Gola Malimbe *Malimbus ballmanni* and no doubt the most charismatic bird species in the area, White-necked Picathartes *Picathartes gymnocephalus*.

The RSPB first became involved in work in Gola over 20-years ago with a rapid biodiversity survey. The survey indicated the importance and the unique value of this site but also highlighted the threats it faced as the forest was previously managed as a production forest reserve, with the primary objective being the extraction of timber. Early conservation work was funded by the Global Conservation Fund for a concession for conservation project, and later by the European Union and the FFEM during the scaling up of the work between 2008 and 2010.

Key achievements

- A major milestone was achieved in 2011, when the GoSL declared the Gola Forest a National Park, in preparation for the establishment of a REDD+ project. The Gola Rainforest National Park (GRNP) was the second National Park to be created in Sierra Leone.
- The first area of forest to develop a REDD+ project in Sierra Leone and indeed in West Africa. The Gola REDD+ project vision is to "act as a catalyst for peace, prosperity and national pride in Sierra Leone, ensuring that the globally important habitats, biodiversity and environmental services of the GRNP and wider Gola landscape are conserved and that neighbouring communities are active

environmental stewards of the natural resource base that underpins and enhances their livelihoods".

- Strong and effective law enforcement system established through the training and empowerment of rangers that are well respected within local communities.
- Strong collaboration established with the government and partners in Liberia through the implementation of a project titled "Across the Border Peace Park" in order to promote the bi-lateral control of encroachment and poaching whilst promoting the sustainable peace between the two countries following their respective brutal civil wars of the 1990s.

Sierra Leone Biodiversity Conservation Project

The Sierra Leone-Biodiversity Conservation Project (SLBCP) was a full-sized, stand-alone GEF Project, with a 5-year implementation period, financed by a GEF Grant in the amount of US $5.0 million, and with financial services provided by World Bank funded Rural and Private Sector Development Project Team. The three sites selected for the project were:
(i) Outamba-Kilimi National Park, (ii) Kangari Hills Non-Hunting Forest Reserve; and (iii) Loma Mountains Non-Hunting Forest Reserve.
The project had three as follows: (1) Strengthen the National Framework for Biodiversity Conservation; and Component; (2) Conservation Site Planning and Management; and
(3) Project Management, Monitoring and Evaluation.

Key achievements

- The Wildlife Conservation Act of 1972 and the Forestry Act of 1988 reviewed and updated to include modern requirement for effective protected area management
- Developed management plans for the three conservation sites (Outamba-Kilimi NP, Loma Mountains NP and Kangari Hills NHFR). Developed Community Action Plans (CAPs) that support conservation linked livelihood activities, such as formation and training of Farmer Field Schools, establishment of tree crop nursery and distribution to farmers, provide groundnuts to farmers, improve rice varieties to farmers, support small infrastructure such as school roofing, solar energy systems.
- Intensify field patrols and strengthen law enforcement through the provision of field logistics such as motor bikes, vehicles, cameras, GPS etc.
- The involvement of local community participation in natural resource management through the Conservation Site Management Committees (CSMC). A co-management structure.
- Developed outreach/communication strategy and carried out awareness raising programme through community meetings, road shows, school nature clubs, radio discussion, T-shirts, calendars, sign post, exhibition of wildlife materials at Agricultural shows etc.
- Trained the Game Guards on techniques for collecting data on flora and fauna through their regular patrolling activities, camera trap based biodiversity monitoring, etc with the necessary data collection protocols, for setting camera trap, using GPS and data sheet in the field.

Sierra Leone Wetlands Conservation Project

The Sierra Leone Wetlands Conservation Project (SLWCP) was a full-sized, stand-alone GEF Project, with a four-year implementation period, financed by a GEF Grant in the amount of US$ 1.80 million. The SLWCP is designed to complement the SLBCP which was primarily focused on terrestrial ecosystems, and to build a coherent national wetland conservation program. The Project targets two main conservation sites; Sierra Leone River Estuary (SLRE) and Mamunta-Mayosso Wildlife Sanctuary (MMWS).

The Project Development Objective was to improve strategic and operational conservation management of wetland areas in Sierra Leone. The project had three components: (1) Strategic Planning for Wetland Conservation; (2) Wetland Conservation Site Planning and Management; and (3) Project Management. The overall expected outcomes included:

Key achievements:

- A Wetland Conservation Act developed for the effective management of wetlands conservation sites. The Act now awaits parliamentary ratification.
- Management plan developed for both the Mamunta-Mayosso and Sierra Leone River Estuary, through extensive community consultation process
- Boundary for Mamunta-Mayosso WS retraced, and MOU signed between local community and NPAA.
- Involve local community participation in natural resource management through the Conservation Site Management Committee (CSMC). A co-management structure established with the NPAA.
- Identify and develop Community Action Plan (CAP) that support conservation linked livelihood activities. CAP includes provision of improved high quality vegetable seeds and groundnut to farmers.
- Train the Game Guards, on techniques for collecting data on flora and fauna through their forest patrolling activities, camera trap based biodiversity monitoring, etc with the necessary data collection protocols, for setting camera trap, using GPS and data sheet in the field.

The Western Area Peninsula Forest Reserve (WAPFoR) Project

The WAPFoR project was a five-year intervention in Sierra Leone, which started in March 2009 and ended in February 2014, funded by the EU and implemented by Welthungerhilfe

(WHH), but it was planned and implemented together with the Environmental Forum for Action (ENFORAC). The overall objective of the project has been to enhance the protection and conservation of the WAPFoR and to decelerate deforestation, as nearly a third of the original forest cover had been destroyed between 1990 and 2008. The WAP Forest Reserve is of crucial importance for the water supply of the entire peninsula population, including the inhabitants of the capital Freetown. Furthermore, Sierra Leone has signed several international conventions and protocols regarding environmental and forest protection, and has developed policy, legislative and institutional framework for its environmental management.

The project concept was based on a coherent result model that: (i) (potential) encroachers are supported with alternative livelihood options to stop their unsustainable utilisation of forest resources; (ii) communities are supported with ecosystem services as well as community empowerment, to facilitate their participation in forest protection; (iii) awareness raising and sensitisation at different levels to create environmental consciousness and an understanding of the lifesaving functions of the forest ecosystem and the importance of conservation; and (iv) the relevant government institutions, particularly Ministry of Agriculture Forestry and Food Security (MAFFS), are strengthened enabling them: to prioritise conservation issues, to advance and implement legislation, and to set up an effective institutional framework.

Key achievements

- The Western Area Peninsula Forest now declared a National Park through Sierra Leone Parliament legislation.
- The WAP Forest is also listed under the UNESCO World Heritage sites, which increased international attention to the forest and therefore its protection.
- A strong awareness created about the core forest zone, and the need for preservation is generally well accepted among all stakeholders, as well as the peninsula population. Nearly 100% of the target population is aware of the importance of the forest ecosystem and what it provides, especially its watershed.
- Around 25% of the villages adjacent to the forest have a fully functional water supply, which has contributed to measurable improvements in living conditions in the communities, e.g. the reduction of waterborne diseases and improved health conditions among the dwellers.
- The project reached only about 13% of an estimated total of 6,000 potential encroachers, (people who derive their income from the forest in a destructive way) with its livelihood support. Of these, approximately 80% managed to establish reasonable alternative income sources, and use these for further investments.
- Some small-scale community-based tourism destinations were promoted. Their income is reasonable, although, their design is at an early stage and the major touristic infrastructure is still rudimentary.

Vegetation and Habitat RestorationEfforts

State of vegetation restoration programmes

he drive to restore the forests in the country can be dated as far back as the colonial era when it became apparent that the country was losing its forests. Various reforestation and even afforestation programmes and strategies have been tried some of which have been quite successful and their outcome are still evident today. However, some other efforts were futile because policies were out of phase with practice, especially in situations where local communities were involved. Most of the unsuccessful reforestation programmes had no management plans, whilst the local communities were not involved in the management of these plots. Thus, there are many reforested plots and wood lots around the country with virtually no management systems.

Reforestation programmes were in most cases carried out during the colonial era using *Gmelina arborea*, mainly as a mechanism for addressing the fuel wood situation and forestalling the rapid deforestation using fast growing tree species. Later, *Acacia* species, *A. mangium* and *A. auriculiformes* were used, which because of their aggressive growth and proliferation potentials have spread widely all over the country. The *Acacia* spp, among a few other species, are extensively used during national tree planting days on 5th June each year. Millions of seedlings have been produced and planted in various locations in the country, especially in the Western Area. Such reforestation activities are normally coordinated by the Forestry Division (MAFFS) and supported by a number of environmental NGOs.

Reforestation has mainly been focused at the production of fuel wood. Several efforts have been made to address the fuel wood situation in the country, particularly through the establishment of woodlots or plantations using fast-growing species mentioned earlier, but these have generally been badly managed at the local level. Recent effort by Miro (an agro-forestry based industry) is establishing thousands of acres of fast growing trees in the Yoni Bana area, the purpose for which may be related to industrial use and not for domestic biomass demand. The primary purpose of the establishment of woodlots was to reduce the dependence on the natural forest for wood resources. Unfortunately, as a consequence of the lack of appropriate adaptive management approaches, no impact has been made in that direction and only a small proportion of fuel wood is extracted from woodlots. Some of the species used for fuel wood production are as follows in descending order of importance: *A. auriculiformes* and *A mangium,Azadirachta indica* (Neem tree), *Gliricidia sepium* and *Cassia siamae*.

Mangrove forest restoration

A number of trials for mangrove vegetation restoration have been done in different localities along the coastal regions, but the success rate has been minimal. These trials were done by the Forestry Division in the early to mid-1990s. One successful mangrove planting was carried out along the Jui Creek, in east Freetown, where the mangrove vegetation is now

reaching over five meters in height and dbh >10 cm in most stands. Another trial that was done in the northern part of the Yawri bay (Tissana area) was unsuccessful, so were many other mangrove planting trials in many other locations. There was a recent mangrove restoration activity carried out at the Aberdeen Creek by the Conservation Society of Sierra Leone, but assessment of success would depend upon the result of a monitoring process over the course of time.

Apparently, the success of mangrove planting is dependent on the species used and the salinity range of the location where it is planted. An understanding of the species-salinity relationship in mangrove vegetation planting is a key factor that determines the level of success in such restoration programmes. However, mangrove vegetation restoration could best be achieved by natural regeneration process, which unfortunately is disrupted by the persistent cutting, poor management regimes and land reclamation for housing.

Restoration of land degraded by mining

Forest and land degradation by mining has been one of the most destructive activities in the environment. Despite the huge damage to land and vegetation, very little restoration activities are going on. However, good examples of restoration using *Acacia* spp and *Gmelina arborea* are evident in Mokanji and other areas around the country. An experimental vegetation restoration programme was undertaken in Rutile funded by Darwin Initiative and implemented by CEH in collaboration with FBC (University of Sierra Leone) and Njala University. The experiment showed positive results of the potential for the restoration of rutile mine tailings through the use of compost manure, which established considerable herb layer and growth of some woody plant species (Fig. 18).

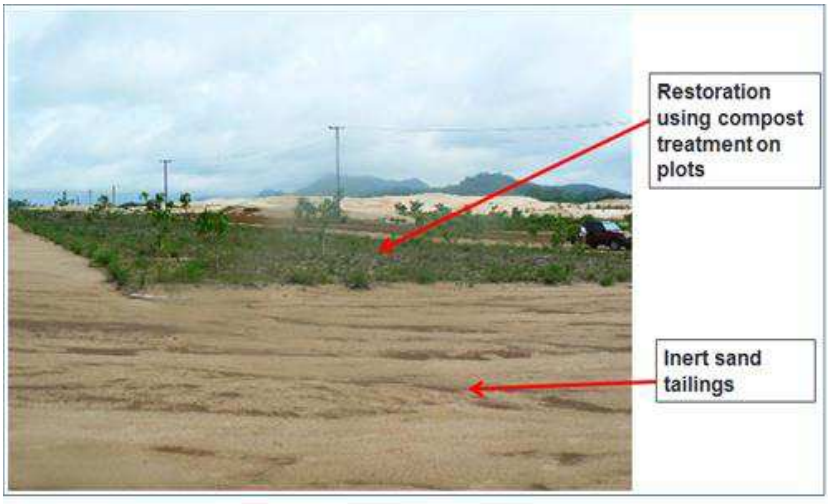


Figure 18 – Experimental restoration trials at on the mine tailings at the Sierra Rutile Mines.

Gmelina arborea was found to be the most adapted species in terms of growth among the five tree species that were tested. The significance of the growth of the herb layer lies on itscapacity to enhance nutrient build up in the soil that can be used for the cultivation of annual/biannual crops like groundnut, pepper, garden eggs and tomato. The entire

programme failed because of the lack of commitment from the SRL to fund the production of compost by the local communities, which supposedly should be part of its corporate social responsibility.

Ex-situ Conservation Actions – Protection outside natural habitat.

Chimpanzees

The only official effort being applied in Sierra Leone to protect or conservation species outside their natural habitat is the Tacugama Chimpanzee Rehabilitation Centre. This Centre is established at the Regent extension of the WAPF and it caters for chimpanzees that had been captured for the wildlife trafficking and pet trade. These chimps, mostly young, orphaned, and caged, are retrieved from perpetrators and taken to the centre where they are quarantined, cared for and later introduced into a semi-wild environment. The ultimate goal of the centre is to release these chimpanzees into their natural environment. For over twenty years now, the centre has taken care of scores of chimpanzees, with funding and/or technical support from various organisations particularly the Jane Goodall Institute.

In April 2006, some of the chimpanzees led by an alpha male named *King Bruno* escaped from the centre and moved into the natural forest. This incidence may indicate the chimps desire to be free in their natural habitat. Since then, neither the live escapees nor their carcasses have been seen by people, which may also indicate that their experience in semi-wild habitats has helped them adapt easily to the wild environment. The Centre has been very instrumental in implementing the Regulations of the Wildlife Conservation Act of 1972 (now under review), through the confiscation of orphaned chimpanzees and the prosecution of perpetrators. The Centre has also been involved in a number of research and surveys on chimps and other primates and large mammals, most of which are carried out to assess the impacts of various projects on the habitat, population and distribution of the species.

Crocodiles

A crocodile holding facility, which appears to have been transformed into a place to keep rescued crocodiles, exists in Jui, just outside the Freetown Municipality. The initial intention of the keeper of the farm was to save a few of the animals that were brought to him by people who captured them, but because he offered money in return, his facility has been overwhelmed by lots of crocodiles. A majority of the crocs brought to the facility are Nile Crocodile *Crocodylus niloticus,* but there also a good number of Dwarf Crocodile *Osteolaemus tetraspis*. Plans are now underway, through collaboration with the Environment Protection Agency, Sierra Leone EPASL and RAP-SL to release these crocodiles into areas where they will find safe and conducive habitats.

Development of Policies and Legislations

The perennial problem of weak law enforcement has been a key factor affecting the conservation of species, habitats and ecosystems in Sierra Leone. But for the intervention of international partners like the RSPB, Birdlife International and Conservation International,

among others, who provided funding and support to support in-situ conservation in key biodiversity concentrations, including surveillance and law enforcement, the country's critical sites for biodiversity would have been in a precarious state. Some NBSAP 2002-2010 interventions have come from the willingness by government to improve on policy and legislations that would ensure effective law enforcement. These include the following legislative and policy interventions:

- 2008–The Environment Protection Agency Act, which brought into existence the EPASL. This agency now controls and coordinates all activities, business and development programmes that impinge on the environment. It is now one of the most powerful agencies of government hosted in the Office of the President.

- 2010 – The Review of Forestry and Wildlife policies, respectively with the aim of ensuring that these two key components of the functions of the Forestry Division of MAFFS are effective and creating the desired impacts. These two policies also focus the importance of building community consensus through education and co-management approaches in conservation biodiversity.

- 2012 – The National Protected Area Authority Act, which brought into existence the National Protected Areas Authority as a statutory body that manages, coordinates, and promote the operations of protected areas in the country. Its mandates also include the identification of areas that can potentially be designated for protection as well as mobilising the funds for the conservation of protected areas including REDD+ initiatives.

- 2015 – The Review of the Wildlife Conservation Act of 1972 (WCA) and the Forestry Act of 1998. This process was funded by the World Bank under the Sierra Leone Biodiversity Conservation Project (SLBCP) which ended in December 2015. The review of the WCA, among other things addressed the issues of out-dated fines and the inclusion of the legal protection of species that are listed in the IUCN Red List and all other species of national conservation interest. Both reviewed acts await ratification by the parliament.

- 2015 – Drafting of the Wetlands Conservation Act. This is one of the key achievements of the Wetlands Conservation Project, a subsidiary of the BCP. The Act now awaits parliamentary enactment. In addition, the BCP developed a National Wetlands Conservation Strategy and conducted a national inventory of the country's major wetlands as one of the main key tools for the implementation of the Wetlands Conservation Act.

Sierra Leone's International Environmental Obligations

As a member of the international community, principally the United Nations and the African Union, Sierra Leone is having a fair share of the global decision making processes that affect a wide range of local national and international issues, including *inter alia* politics, environment and biodiversity. The country's contribution to addressing global environmental and biodiversity issues is well recognised, particularly as a founding signature of the African Convention on the Conservation of Nature and Natural Resources at its inception in 1968. Successive governments have put environment and biodiversity issues at the forefront of their policies and legislative actions, especially in terms of working with other nations in addressing these and related concerns. Among the many conventions and agreement signed by the Government of Sierra Leone, those related to biodiversity are outlined in Table 10; the dates of signing and/or ratification are also given.

Table 10 - List of Conventions and Agreements signed and/or ratified by the Government of Sierra Leone relevant to biodiversity.

Convention/Agreement	Date signed	Date ratified
Nagoya Protocol	30th January 2017	-
Basal Convention	-	1st November 2016
Kyoto Protocol (extension of UNFCC)	-	10th November 2006
International Convention for theControl and Management of ShipsBallast Water and Sediment 2004		21st November 2003
Montreal Protocol	-	29 August 2001
Stockholm Convention on Persistent Organic Pollutants	-	26th September 2003
International Convention for thePrevention of Marine Pollution fromShips, 1973 and Protocol of 1978(MARPOL 73/78)	-	23rd May 2000
Convention on Wetlands (Ramsar)	-	December, 1999
UN Convention on Desertification (UNCCD)	-	20th September 1997
Convention on Biological Diversity (CBD)	10th March 1995	
Convention on the International Trade in Endangered Species (CITES)	October 1994	January 1995
Convention on Migratory Species (CMS)	Non Party	-
African Eurasian Waterbird Agreement	MoU	-
UN Convention on the Law of the Sea (UNCLOS)	15th December 1994	-
UN Framework Convention on Convention (UNFCC)	11th February 1993	22nd June 1995
International Plant Protection Convention 1997	23rd June 1981	
African Convention on Conservation of Nature and Natural Resources	!968	15th September 1968

Since the mid-1980s, Sierra Leone has implemented international wildlife regulations long before the signing of CITES. In 1986, a presidential ban was imposed on the export of wildlife and their trophies from the county because of the indiscriminate wildlife exploitation for trade (particularly chimpanzees and elephants). This ban was preceded by the confiscation of twenty infant chimpanzees deem for shipment, an action that was initiated by the WWF against a major pharmaceutical company in Vienna, Austria. In addition all border posts have stationed wildlife officers whose function is to stem the smuggling of wildlife, trophies and souvenirs out or into the country. Also, the Conservation Society of Sierra Leone (CSSL) has been conducting regular surveys of migratory water birds in collaboration with the former Wildlife Branch of the Forestry Division, MAFFS; these activities, which started in 1992, long before the signing of the Ramsar Convention, are still on-going and are mainly sponsored by Wetlands International and Wadden Sea Initiative.

SECTION III
THE STRATEGY AND ACTION PLAN 2017-2026

Conceptual and Strategic Framework

Sierra Leone's biodiversity has gone through a period of slow, but steady decline since the colonial era. There been several interventions by government and its national partners to slow down the spate of deforestation, habitat destruction and species decline, yet the state of national biodiversity is getting worrisome. This situation is not common to Sierra Leone, but is part of a global problem that needs to be addressed from collective and concerted national efforts; thus the importance of the NBSAP.

In Sierra Leone, the NBSAP 2004-2010 was implemented in the midst of the process of rehabilitation, reconstruction and reintegration programmes, following the 1991-2001 civil conflict, which devastated the country's infrastructure, governance and social systems. Therefore the review of the NBSAP cannot be more timely now that the government is in its prime stage of implementing its Agenda for Prosperity (A4P) (or Poverty Reduction Strategy Paper - PRPS III) and the President's Recovery Priorities following the equally devastating invasion of the ebola virus disease in 2014, which lasted for almost two years.

The thematic areas considered in the development of the NBSAP 2017-2026 are consistent with the CBD themes, strategic goals and targets, which are global and correlate neatly with the state of biodiversity conservation in Sierra Leone. The strategies and actions that constitute the main focus for this NBSAP 2017-2026are terrestrial biodiversity, wildlife and forest biodiversity, agricultural biodiversity, and inland freshwater, marine and coastal biodiversity. Cross-cutting issues such as training, funds and budgetary issues, monitoring and evaluation, inter-agency cooperation and gender mainstreaming have been covered across each of the strategic objectives given.

The rationale for the approach to addressing cross-cutting issues is to ensure that they are specifically catered for within the strategies and actions required to achieve each of the stated strategic objectives. For instance, the budgetary and technical inputs required for in-situ conservation action differs considerably from that required for strengthening the relationship between CBD and other international conventions and agreements. Some of the cross-cutting and other actions may seem to have been repeated, but this was deliberate, in order to emphasize and prioritise attention for their implementation.

This updated NBSAP has five Strategic Objectives consistent with the five Strategic Goals of the CBD, respectively, followed by at total 23 Strategic Outputs. Each strategic output has between three and eight strategies and actions that are have been identified through the various consultative processes and activities over the last three to four years. A total of 119

strategies and actions were listed, each of which has one or a couple of indicators that would form the key focus of the monitoring aspect of the implementation process of the NBSAP. This would require the development of an NBSAP 2017-2026 Monitoring and Evaluation Plan in the near future, in order to track the successes and challenges of the implementation process. The time frames indicate the expected delivery date by which the strategy of actions would have been completely achieved or at the least being implemented.

Vision for Sierra Leone's NBSAP

Sierra Leone's biodiversity, natural ecosystems and habitats are well preserved, protected and sustainable managed for the benefit, development and perpetual prosperity of its present and future generations.

Mission for Sierra Leone's NBSAP 2017-2026

By 2026, all strategies and programmes geared towards biodiversity conservation are implemented with significant progress made and manifested by improved status of diverse ecosystems and wildlife, with lasting benefits to the local communities and the people of Sierra Leone.

National Strategic Objectives

A. Sierra Leone's biodiversity is well conserved through sound and holistic national legislation and policy implementation across all sectors.

B. Practical methods and mechanisms enhanced and functioning to safeguard biodiversity, resulting in improved conservation status of threatened and rare species.

C. Practical and robust conservation actions are significantly enhancing the status of species, habitats, sites and ecosystems in and outside protected areas.

D. Improved living standards, ecosystem services and opportunities provided to people, particularly local communities through sustainable and inclusive biodiversity conservation actions.

E. Improved sectoral and public involvement, and enhanced capacities and awareness, are contributing to effective, result-oriented planning and execution of conservation projects and programmes.

CBD STRATEGIC GOAL A

ADDRESS THE UNDERLYING CAUSES OF BIODIVERSITY LOSS BY MAINSTREAMING BIODIVERSITY ACROSS GOVERNMENT AND SOCIETY

NATIONAL STRATEGIC OBJECTIVE A

SIERRA LEONE'S BIODIVERSITY IS WELL CONSERVED THROUGH SOUND AND HOLISTIC NATIONAL LEGISLATION AND POLICY IMPLEMENTATION ACROSS ALL RELEVANT SECTORS

STRATEGIC OUTPUT A1
Effective Public Education and Awareness Programmes Delivered and Improving People's Attitudes and Behaviour Towards Biodiversity Conservation.
Aichi Target addressed – Target 1. Total budget = $ 2,720,000.

	Strategy or Action	Time frame & Cost ($)	Key Indicators	Responsible Partners
A1(i)	Promote and implement awareness raising programmes for opinion leaders at all levels of society including grass root movements, NGOs, funding agencies, the media and Government officials	2018 – 2026 500,000	• Policy and decision making at various governance and opinion sectors influenced by widespread and clear understanding of the issues affecting biodiversity conservation	MAFFS (FD), EPA, NPAA, the Universities
A1(ii)	Develop and implement a comprehensive local level and nation-wide public education and awareness program on biodiversity conservation.	2018 – 2026 1,000,000	• Monthly awareness programmes for forest conservation aired on most popular radio stations in all district headquarter town. • Produce and disseminate easily comprehendible posters with forest conservation message to local communities • A significant proportion of the public, particularly local communities' attitude and behaviour influenced by	MAFFS (FD), EPA, NPAA, MLGRD & the Universities

			improved awareness of biodiversity issues.	
A1(iii)	Incorporate awareness raising and environmental programmes for biodiversity into sectoral policies and legislative frameworks	2018 – 2022 20,000	• Sectoral activities and functions strongly determined by environmental and biodiversity considerations.	MAFFS (FD), EPA, NPAA, FBC & NU
A1(iv)	To integrate environmental education, including biodiversity in education curricula	2019 – 2024 1,000,000	• Science courses being taught in schools and tertiary institution incorporate basic and introductory components of secondary schools, thus building a cadre of future leaders that will support biodiversity issues.	MAFFS (FD), EPA, NPAA, MEST & the Universities
A1(v)	Adopt non-formal approaches to environmental education for the majority of the rural population	2019 – 2023 200,000	• Simple and comprehendible biodiversity conservation messages disseminated through cultural and traditional methods like drama, traditional songs, are making significant positive impact on biodiversity conservation	MAFFS (FD), NPAA & MLGRD

STRATEGIC OUTPUT A2 **Ensure that Sound Policy, Legislative and Institutional Measures for Biodiversity Conservation, including International Conventions are in place and Operational.** **Aichi Targets addressed – Target 2 & Target 3. Total budget = $ 220,000. .**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
A2(i)	Strengthen the EPA and NPAA acts and related regulations to include monitoring across the country;	2017 – 2019 20,000	• Sound and practical conservation actions achieved in key sites due to the implementation of monitoring activities	NPAA & EPA
A2(ii)	Revisit and enact policies and legislations that enhance the implementation of biodiversity strategies.	2018 – 2023 20,000	• At least two implementable legislations passed enhancing biodiversity conservation through exerting control on indiscriminate resource exploitation and use.	MAFFS, Environmental NGOs, NPAA & EPA

A2(iii)	Review policy, guidelines and regulations on urbanization schemes that affect biodiversity.	2018 – 2023 30,000	• The intricate linkage between urbanisation and biodiversity conservation is well addressed in a number of policies, legislative and regulatory framework.	EPA, Ministry of Lands, MAFFS& NPAA
A2(iv)	Review government decentralisation schemes, with strong biodiversity components especially for provincial towns and rural areas	2020 – 2024 30,000	• Provincial and rural ecological settings become attractive to investors and visitors, thus providing much need pro-biodiversity employment opportunities.	NPAA, EPA, MTC, MIA, GDS.
A2(v)	Support and promote the setting up of a mechanism and institutional framework for coordination and collaboration among agencies on matters related to biodiversity.	2018 – 2019 10,000	• An inter-agency coordination committee mainly comprised of MAFFS, EPA, NPAA, MLHCP, NGOs the Universities, is introducing progressive impacts on policy and action on biodiversity.	MAFFS, EPA & NPAA
A2(vi)	Strengthen the relationship between CBD and other environment and biodiversity conventions	2018 – 2020 50,000	• The CBD Focal Point is empowered to effectively coordinating biodiversity related conventions and agreement signed by the GoSL • A forum established for coordinating and creating synergies among relevant conventions.	EPA, MAFFS (FD) , & NPAA
A2(vii)	Establish functional steering committees for the joint identification, planning implementation and monitoring of the programmes under the different conventions	2018 – 2020 100,000	• Policy direction established for the administration and internalising international biodiversity conventions and agreement. • At least two more relevant conventions signed or ratified by 2026	MAFFS (FD) , EPA & NPAA

STRATEGIC OUTPUT A3 **All Development, Extractive and Related Projects are Preceded by Sound Environment and Social Impact Assessment** **Aichi Target addressed – Target 4. Total budget = $ 5,110,000. .**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
A3(i)	Provide additional funding for the expansion of EPASL to cover the entire country;	2019 – 2026 5,000,000	• Regional offices of the EPA established in all provincial headquarter town and satellites offices present in all districts • The function of EPA creates concrete and verifiable impacts in environmental management across the country	Office of the President, EPA & Parliamentary Committee on the Environment.
A3(ii)	Review the mining policy and legislation with the view to ensure biodiversity considerations are incorporated into all mining operations.	2020 – 2024 10,000	• Revised/amended Mining Policy and Act available and being implemented • No part or all of any forest reserve, a forest zone or a any biodiversity sensitive marine/aquatic zone is offered for mining concession.	EPA, NPAA & MMMR, MAFFS (FD)
A3(iii)	Further strengthen the effective monitoring and enforcement mechanisms of the existing regulations under the EIA guidelines both for large scale and artisanal projects	2018 – 2022 100,000	• A updated monitoring plan available and is being implemented. • Concrete environmental control objectives for large-scale and artisanal projects achieved with verifiable evidence.	EPA, NPAA & Universities

STRATEGIC OUTPUT A4 **A Workable Mechanism for Mobilising Incentive Measures for Biodiversity Conservation Established and Being Implemented.** **Aichi Targets addressed – Target 3 & Target 4. Total budget = $ 300,000.**				
	Strategy or Action	**Time frame& cost ($)**	**Key Indicators**	**Responsible Partners**
A4(i)	Review and update sectoral policies and EPA regulations to include incentive measures for programmes on conservation and sustainable use of biodiversity	2018 – 2020 30,000	• Further review of sectoral policies incorporates incentives for sustainable use of biodiversity in the long term.	EPA, Office of the President MAFFS (FD), NPAA, MLCPE, MLGRD, MMMR
A4(ii)	Develop a national programme on incentives to promote the design and implementation of new target-oriented measures to address specific threats and underlying causes of biodiversity loss	2020 – 2021 10,000	• Relevant Government agencies, NGOs, exploiters and user collaborates to ensure that incentive measures are working and enhancing biodiversity conservation in target areas.	MAFFS (FD), EPA, NPAA, MLGRD, MMMR & NGOs
A4(iii)	Promote and co-ordinate private sector initiatives to include incentive measures in conservation and biodiversity programmes	2019 – 2026 60,000	• Private sector investment into beneficial biodiversity conservation activities increase significantly due to attractive incentive measures	MAFFS (FD), EPA, NPAA, MFED & NGOs
A4(iv)	Provide incentives to forest managers and rangers that maintain or enforce existing forest boundaries in reserves	2020 – 2026 200,000	• Managers and rangers of forest reserves are highly motivated and is creating positive impact on forest biodiversity	MAFFS (FD), NPAA & NGOs

CBD STRATEGIC GOAL B

REDUCE THE DIRECT PRESSURES ON BIODIVERSITY AND PROMOTE SUSTAINABLE USE

NATIONAL STRATEGIC OBJECTIVE B

PRACTICAL METHODS AND MECHANISMS ENHANCED AND FUNCTIONING TO SAFEGUARD BIODIVERSITY, RESULTING IN IMPROVING CONSERVATION STATUS OF THREATENED AND RARE SPECIES

Strategic Output B1

The Conservation of Forest Biodiversity Significantly Enhanced through Effective Law Enforcement and Programme Implementation

Aichi Target addressed – Target 5. Total budget = 3,700,000.

	Strategy or Action	Time frame& cost ($)	Key Indicators	Responsible Partners
B1(i)	Strongly enforce forest laws and regulations with penalties and fines levied on violators and encroachers	2017 – 2026 1,000,000	• Number of forest rangers increased by at least 50% its current size • Surveillance time for forest rangers increased by 50% • Forest rangers receive regular in-service military-type training at least once a year	MAFFS (FD) & NPAA Local authorities
B1(ii)	To adopt alternative measures that have the lowest ecological footprints	2017 – 2026 1,000,000	• Lucrative non-timber forest products like bee keeping and edible mushroom farming among others introduced into non-carbon forest resource exploitation schemes. • At least one pro-biodiversity enterprise established and functioning in one forest reserve each year.	MAFFS (FD) NPAA, MFMR& EPA
B1(iii)	Support reforestation activities at community and grass root levels for	2018 – 2023	• Community-level reforestation schemes is restoring vast areas of terrestrial ecology in all 12 districts	MAFFS (FD) NPAA, &

	terrestrial and mangrove forest	1,000,000	• At least local farmers trained and empowered to engage in beneficial agroforestry development in at least one district per year	MLGRD
B1(iv)	Sponsor and undertake research on the regeneration of native tree species	2017 – 2024 100,000	• Research funds provided to at least five university student to undertake research on the reforestation potentials of native tree species • At least one reforestation research project carried out each year by the FD in collaboration with the universities	MAFFS (FD) NPAA, FBC, &
B1(v)	Undertake inventories to ensure sustainable utilization of forest biodiversity	2018 – 2026 500,000	• Inventory and monitoring protocol for Sierra Leone forests developed and made available. • 50% or more of all major forest reserves inventoried for tree biomass and other resources • Potential for REDD+ funding or carbon trading achieved in some of the major forest.	MAFFS (FD) NPAA, FBC & NU
B1(vi)	Restrict, control and monitor power chain saws use in forest reserve	2017 – 2026 10,000	• Strong control such as a ban and heavy taxation in licensed use, reduced the rate of forest loss by at least 40%, from illegal use of power saws.	MAFFS (FD) & NPAA

Strategic Output B2 **The Conservation of Coastal and Marine Biodiversity, including Fisheries is Prioritised in National Programmes, Policies and Legislations.** **Aichi Targets addressed – Target 5 & Target 6. Total budget = $ 1,120,000.**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
B2(i)	Conduct research into the status of biodiversity in the major coastal and	2017-2025	• IMBO and MFMR collaborating to plan and execute research activities on marine biodiversity.	NPAA, MFMR, IMBO (FBC),

	marine ecosystem, particularly coral reefs.	1,000,000	• Sound research reports being used to improve the status of coastal and marine biodiversity, including coral reefs, and addressing the sea weed invasion.	NU & SLMA,
B2(ii)	Promote an integrated approach to the management of marine and coastal ecosystems	2018 – 2022 50,000	• An Inter-agency Committee set up to coordinate and provide policy direction for marine resources management. • Local community groups at key coastal site are addressing issues relating to exploitation of marine resources, especially fishing through monthly meetings.	MFMR, EPA, NPAA, SLMA, Local authorities& IMBO
B2(iii)	Adopt and implement the FAO code of conduct for responsible fishing	2017 – 2021 10,000	• The FAO code of conduct accessed and made available to stakeholders and important groups. • Relevant aspects of the FAO code of conduct is being implemented at ministerial and community levels are leading to improved fishing practices.	MFMR & NPAA, CSOs, Local authorities
B2(iv)	Enhance the enactment of the Marine Protection Act	2018 – 2020 10,000	• Proposed Marine Pollution Act reviewed, enacted and being applied to address emerging challenges with detectable improvements in marine ecology. • At least one more viable coastal/marine ecosystem declared for protection	MFMR, IMBO, SLMA&EPA
B2(v)	Promote and support the implementation of the management of the existing and proposed coastal/marine conservation areas.	2018 – 2020 150,000	• Management plans for each of the MPAs produced by 2025. • A Management Committee set up within the MFMR for the promotion of the management of MPAs	MFMR, NPAA, IMBO, SLMA& EPA

Strategic Output B3 **Ecological Restoration and Recovery of Species and Ecosystem under Threat is Significantly Improved** **Aichi Targets addressed – Target 1 & Target 10.Total budget = $ 1,710,000.**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
B3(i)	Identify and demarcate critical ecosystems under threat, including coral reefs.	2018 – 2024 1,000,000	• Surveys and desk studies identify at least three additional areas of critical ecosystem needing protection. • At least two more viable terrestrial ecosystem identified and steps taken to designate them for protection	NPAA & MAFFS (FD)
B3(ii)	Review and update sectoral policies and laws in line with the provisions of article 8(f) of the CBD	2018 – 2021 10,000	• Relevant sectoral policies and laws reviewed and updated through a consultative process • Recommendations from the reviewed process being implemented to address provisions of Article 8(f) of CBD.	NPAA, MAFFS (FD) & EPA
B3(iii)	Develop and implement recovery programmes especially for threatened species and threatened ecosystem.	2017 – 2026 100,000	• At least one species-focused and one ecosystem-focused ecological research conducted bi-annually and research findings applied successfully. • At least 10% of threatened critical ecosystems restored • Management plan for at least one threatened species developed biannually and being implemented.	NPAA, MAFFS (FD), MFMR FBC & NU
B3(iv)	Promote the active participation of the local communities in ecological restoration and species recovery efforts	2018 – 2023 100,000	• A local community involvement action plan developed and being implemented in at least 30% of these communities. • A good number of local communities accept the concept of ecological restoration and initiating steps to	NPAA, MAFFS (FD) & MLGCD

			recover lost habitat for species	
B3(v)	Update and keep herbarium, voucher and living specimen of rare and threatened species	2017 – 2016 500,000	• Both herbariums at NU and FBC well-resourced and functioning effectively. • Living herbarium and museums of some threatened rare plants established at NU and FBC.	NU, FBC, NPAA & EPA

Strategic Output B4 **Pollution Levels and Spread of Alien Species (Flora and Fauna) are Controlled and Well Managed.** **Aichi Target addressed – Target 8 & Target 9. Total budget = $ 1,760,000. .**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
B4(i)	Promote scientific investigations into the types, origin and potential impacts of alien species (including introduction of ballast water) on native biodiversity,	2018 – 2023 100,000	• Comprehensive compendium of invasive flora and fauna produced, • A management plan for the management of invasive species produced and being implemented	MAFFS, NU, FBC (USL), NPAA, MFMR, CSOs.
B4(ii)	Review and strengthen existing policies and legislation on alien species.	2018 – 2020 10,000	• A field manual for the identification and monitoring of alien flora and fauna species produced and being used.	MAFFS (FD), NU, FBC
B4(iii)	Develop and promote programmes for monitoring, control and surveillance of alien species	2018 – 2020 100,000	• A strategy develop to control and mitigate the impact of invasive species on native biodiversity • At least the impact of one invasive flora and one invasive fauna significantly controlled	MAFFS (FD), NU, FBC, NPAA, MFMR
B4(iv)	Enhance public education and awareness about the impacts of alien species and pollution of ecosystems	2018 – 2025 50,000	• Effective public education awareness programmes developed and implemented • At least 30% of the public are aware of the impact of	MAFFS (FD), CSOs & EPA

			invasive species and ecosystem pollution.	
B4(v)	Limit the use of invasive alien species and promote the use of indigenous species in restoration efforts	2018 – 2023 500,000	• The wide use of exotic alien species *Acacia* and *Buceana* spp among others are significantly controlled. • Proven viable indigenous species used in all ecological restoration efforts by 2026.	MAFFS (FD), EPA, NPAA, the Universities
B4(vi)	Assess pollution levels from industrial and domestic sources and take relevant steps to control them	2018 – 2025 1,000,000	• Report of assessment produced and recommendations being implemented • Industries agreed to use available technological mechanisms to reduce pollution levels by at least 30% by 2026. • Domestic waste disposal especially into coastal and aquatic systems significantly controlled.	

Strategic Output B5 **Biodiversity Resources are Sustainable Utilised and Conserved for the Benefit of Current and Future Generations.** **Aichi Targets addressed – Target 7 & Target 8. Total budget = $ 1,530,000.**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
B5(i)	Review and update sectoral policies and legislative guidelines on sustainable exploitation and use of biological resources	2018 – 2020 50,000	• Practical and result-oriented concepts incorporated into policies and guidelines for sustainable resource exploitation.	MAFFS (FD) & NPAA
B5(ii)	Develop and promote the implementation of a resettlement policy and action plan for populations that exert immense pressure on sensitive ecosystems, such as	2018 – 2020 30,000	• A resettlement plan document developed and available • A significant number of people resettled to suitable locations as a consequence of the implementation of the policy and plan	MAFFS (FD), MLCPE, NPAA EPA, Parliamentary Sub-Committees

	wetlands, forests, wildlife & fisheries			
B5(iii)	Promote the use of appropriate technologies in the harvesting and harnessing of biological resources	2020 – 2022 100,000	• At least two research project implemented on appropriate technology and reports available • An efficient and beneficial mechanism set up through the use of locally invented appropriate technology.	MAFFS (FD), NPAA, EPA, NU, FBC, CSOs
B5(iv)	Develop and promote measures that encourage sustainable consumption and efficient use of biological resources	2020 – 2026 1,000,000	• At least one controlled fuel wood resource use experiment in progress in each region and relevant knowledge and skills being acquired. • Efficient agro-forestry and animal husbandry systems up and running in each district in Sierra Leone.	MAFFS (FD), NU & FBC
B5(v)	Strengthen and upgrade existing enforcement mechanisms for sectoral policies and regulations on sustainable use of biodiversity components	2018 – 2023 20,000	• Updated regulatory and sustainable use of biodiversity component becomes a vital component of all relevant sectoral policy and actions, particularly agriculture, forestry and fisheries. • A task force for the implementation of regulatory and sustainable use of resources set up and making significant impacts.	MAFFS (FD), NPAA & EPA
B5(vi)	Conduct national surveys to determine consumption patterns and hence prescribe allowable customs (i.e. balance supply and demand).	2018 – 2020 30,000	• Surveys/studies conducted covering over 60% of the country and the reports available • Survey/studies report being implemented and effecting change on consumption patterns	MAFFS (FD), NPAA & Universities
B5(vii)	Promote and support customary and traditional resource use patterns that ensures sustainable use of biodiversity	2018 – 2020 50,000	• A report produced through studies on sustainable traditional use patterns. • Sustainable traditional use patterns included in traditional laws and changing consumption patterns	MAFFS (FD), NPAA & EPA

CBD STRATEGIC GOAL C

TO IMPROVE THE STATUS OF BIODIVERSITY BY SAFEGAURDING ECOSYSTEMS, SPECIES AND GENETIC DIVERSITY

NATIONAL STRATEGIC OBJECTIVE C

PRACTICAL AND ROBUST CONSERVATION ACTIONS ARE SIGNIFICANTLY ENHANCING THE STATUS OF SPECIES, HABITATS, SITES AND ECOSYSTEMS IN AND OUTSIDE PROTECTED AREAS

Strategic Output C1

The Conservation Status of Protected Areas (Parks, Forest Reserves, Game Reserves and Sanctuaries)and the Wildlife therein Significantly Improved.

Aichi Targets addressed – Target 12 & Target 13 Total budget = $ 6,780,000.

	Strategy or Action	Time frame & Cost ($)	Key Indicators	Responsible Partners
C1(i)	Conduct a comprehensive scientific study of the biodiversity of the major ecosystems	2019 – 2021 1,000,000	• Comprehensive reports of the biodiversity of major ecosystem published within five years • At least one PhD and two MSc thesis and several under graduate research reports produced on biodiversity themes and species-focused research	MAFFS (FD), NPAA, FBC & NU
C1(ii)	Undertake nationwide inventory of wildlife population.	2018 – 2023 1,000,000	• An updated inventory of the of the wildlife of Sierra Leone available and is a valuable reference material.	MAFFS (FD), NPAA, FBC, NU
C1(iii)	Develop human resources and strengthen institutional capacity for wildlife management	2018 – 2022 1,000,000	• Training courses at certificate and undergraduate level for wildlife inventory and management conducted in at least two tertiary institutions. • At least 20 forestry and wildlife officers receive	MAFFS (FD), NPAA, FBC & NU

			relevant training to the required academic level.	
C1(iv)	Establish a centralized system for the coordination of national wildlife management activities	2018 – 2022 1,500,000	• A resource centre for wildlife data and management is established, resourced and hosted by the NPAA. • Regional offices of the NPAA established and hosting wildlife data and coordination system	MAFFS (FD), NPAA, FBC & NU
C1(v)	Promote sustainable utilization and harvesting of wildlife resources	2018 – 2022 30,000	• Include sustainable utilisation on forestry and wildlife policies • Widely acceptable sustainable mechanism for harvesting and utilisation of wildlife resources creating positive impact.	MAFFS (FD) , NPAA, EPA, Local authorities
C1(vi)	Establish an effective monitoring and enforcement mechanism for biodiversity and conservation especially in protected areas	2018 – 2018 250,000	• A monitoring and enforcement plan developed for conservation in protected areas. • Implementation of monitoring and enforcement plan is effective and improving conservation status in at least three protected areas.	MAFFS (FD) & NPAA
C1(vii)	Develop project proposal for the funding for wildlife conservation activities in PAs	2018 – 2020 2,000,000	• At least two project proposals are funded for the conservation of wildlife in two PAs. • Populations of target threatened species improved significantly in response to project implementation.	MAFFS (FD) & NPAA

Strategic Output C2 **The Ecological Integrity of Inland and Freshwater Ecosystems Significantly Improved through Sound Conservation Actions.** **Aichi Target addressed – Target 11 Total budget = $ 300,000. .**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
C2(i)	Formulate national policy and legislation on inland aquatic ecosystems management that emphasizes an integrated approach	2018 – 2019 30,000	• Management Plan developed for the conservation of inland wetlands • Policy and legislation developed for inland aquatic ecosystem is being implemented.	MAFFS (FD) NPAA, EPA, The Universities
C2(ii)	Enact and enforce legislation that controls exploitation of wetland resources.	2018 – 2019 10,000	• The exploitation of wetlands resources well controlled and is beneficial to biodiversity and people.	MAFFS (FD) NPAA & EPA
C2(iii)	Enact and enforce legislation that control wild bush fire, especially in savanna areas	2018 – 2020 10,000	• Habitat degradation due to wild bush fires reduced by at least 40%.	MAFFS (FD) NPAA, EPA & MLGRD
C2(iv)	Promote community-driven sustainable use of wetland and inland water ecosystems resources	2018 – 2022 50,000	• The involvement of local communities in inlands wetlands management is significantly improving inland aquatic biodiversity.	MAFFS (FD) NPAA & EPA
C2(v)	Through legislation solicit financial support for agencies involved in the management of inland water ecosystems including research	2018 – 2022 100,000	• At least two proposals funded for research into inland aquatic ecosystem. • Improved and updated data on inland wetlands biodiversity available for management and monitoring.	MAFFS (FD) NPAA, EPA, Universities, NGOs
C2(vi)	Adopt and promote measures that will encourage activities that do not adversely affect water ecosystems, their quality and hydrology	2018 – 2023 200,000	• Innovative, sustainable and pro-conservation activities are generating private ventures in 30% of all wetlands • Water quality significantly improves through incentive driven environmentally friendly farming practices.	MAFFS (FD) NPAA & EPA

Strategic Output C3 **In-Situ Conservation for Species and Ecosystems in Protected Areas Enhanced by At Least 30%, Leading to Improved Conservation Status of Threatened Species and Habitats.** **Aichi Targets addressed – Target 12 & Target 13. Total budget = $ 5,800,000.**				
	Strategy or Action	**Time frame and Cost ($)**	**Key Indicators**	**Responsible Partners**
C3(i)	Review and update existing sectoral policies and legislation relating to PAs, apart from those of the NPAA.	2018 – 2019 30,000	• The 1972 Wildlife Conservation Act, the 1988 Forestry Act review process completed and enacted by Parliament and being implemented • The new draft Wetlands Acts of 2015 reviewed and enacted by Parliament and being implemented	MAFFS (FD) NPAA & FBC & NU
C3(ii)	Conduct a strategic reassessment of the status of existing PAs	2019 – 2021 100,000	• A report on the strategic assessment of PAs available and the results being applied to improve on their conservation status. • Management Plans for at least four more PAs developed and being implemented.	MAFFS (FD) NPAA & FBC & NU
C3(iii)	Issue unified guidelines amongst institutions for the management of PAs	2018 – 2020 20,000	• Unified guidelines developed through a consultative approach • Consistent and collaborative management of PAs achieved amongst relevant institutions, with little or no conflict of interest.	MAFFS (FD) NPAA, MLCPE, EPA, MMMR, & MLGRD
C3(iv)	Enhance training and manpower capacity to manage PAs	2018 – 2023 150,000	• A PA management training needs assessment develop and being implemented. • Improved PA management achieved through on-going graduate and in-service training by at least 20% of relevant staff.	MAFFS (FD) NPAA & FBC & NU

C3(v)	Enforce appropriate regulations relating to management of PAs	2018 – 2026 500,000	• The protection and biodiversity conservation status in PAs improved significantly, evidenced by improved habitat conditions and increased population of some threatened species.	MAFFS (FD) NPAA & FBC NU, SLP.
C3(vi)	Implement conservation programme targeting at least two critical ecosystem and threatened species	2019 – 2026 5,000,000	• The status and ecological condition in at least one terrestrial sites and one wetland site greatly enhanced • The conservation status of 20% of all threatened species in targeted ecosystem improved significantly	NPAA, EPA, MAFFS (FD), FBC & NU, .

Strategic Output C4
In-Situ Conservation Outside Protected Areas Enhanced by at Least 20%, Significantly Improving the Status of Habitats for Rare and Threatened Species.
Aichi Targets addressed – Target 12 & Target 13 Total budget = $ 1,510,000.

	Strategy or Action	**Time frame and Cost ($)**	**Key Indicators**	**Responsible Partners**
C4(i)	Review and incorporate into sectorial policies and laws on biodiversity management of ecologies outside of PAs	2018 – 2022 10,000	• The reviewed and enacted legislation for wildlife forestry and wetlands, contain relevant clause that favour conservation actions outside protected areas • The NPAA and EPA are further empowered through improved legislation and policy action to effect wildlife management outside PAs.	MAFFS (FD), EPA, NPAA, MLCPE, MLGRD & MMMR
C4(ii)	Identify and assess the status of the species outside of PAs and implement project to conserve them	2018 – 2020 1,300,000	• Management plan for protected species outside PAs available including survey reports for flora and fauna. • The location, populations and conservation status of all threatened species outside protected areas identified and action taken to protect them.	MAFFS (FD) NPAA & FBC & NU

C4(iii)	Develop and implement guidelines for the sustainable use of biological resources outside of PAs	2018 – 2022 100,000	• Guidelines for sustainable use of biological resources outside PAs being implemented and creating positive impacts on target species and ecosystems.	MAFFS (FD) NPAA & FBC & NU
C4(iv)	Promote the participation of local communities NGOs and the private sector in the management of areas outside of the PAs	2018 – 2020 100,000	• Local communities benefiting from private sector investment and ecosystem services due to participation in conservation of biological resources outside PAs • At least two Environmental/Conservation NGOs engaged in species and/or ecosystem project or programmes outside PAs.	MAFFS (FD) NPAA & MLGRD

Strategic Output C5 **Ex-Situ Conservation Programmes Designed, Supported and Implemented with Tangible Results.** **Aichi Target addressed – Target 13 Total budget = $ 2,610,000.**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
C5(i)	Develop the national capacity for ex-situ conservation by rehabilitating existing facilities and establishing new ones	2019 – 2023 1,000,000	• An effective system operational in achieving ex-situ conservation in a number of thematic areas • All threatened species living outside protected area are protected under conservation legislations	MAFFS (FD) & NPAA
C5(ii)	Strengthen educational and research institutions to expand their ex-situ projects	2019 – 2023 1,500,000	• Modules on ex-situ conservation incorporated into training programmes in at least two tertiary institutions • At least two En-situ research carried out and reports available	NPAA, MAFFS (FD), FBC, NU.

C5(iii)	Incorporate ex-situ conservation measures into sectoral policies and laws	2019 – 2023 50,000	• All reviews of legislations and policies on biodiversity conservation incorporate ex-situ measures	NPAA, MAFFS (FD)
C5(iv)	Promote private sector initiatives and participation in ex-situ conservation activities	2019 – 2023 60,000	• At least two concrete private sector investments secured to effect ex-situ conservation.	NPAA, MAFFS (FD) & MFED

CBD STRATEGIC GOAL D

ENHANCE THE BENEFITS TO ALL FROM BIODIVERSITY AND ECOSYSTEM SERVICES

NATIONAL STRATEGIC OBJECTIVE D

IMPROVED LIVING STARNDARDS, SERVICES AND OPPORTUNITIES PROVIDED TO PEOPLE, PARTICULARLY LOCAL COMMUNITIES, THROUGH SUSTAINABLE AND INCLUSIVE BIODIVERSITY CONSERVATION ACTIONS

Strategic Output D1
Plant Resources for Agricultural are Effectively Harnessed and Managed for the Benefit of Biodiversity and People
Aichi Targets addressed – Target 14 & Target 16. Total budget = $ 2,350,000.

	Strategy or Action	Time frame and Cost ($)	Key Indicators	Responsible Partners
D1(i)	Develop policies that promotes agricultural systems and practices that enhance agricultural biodiversity	2019 – 2020 20,000	• A concise policy document available is being applied • Indigenous agricultural biodiversity maintained, improved upon and being beneficial to Sierra Leone	MAFFS, IAR & NU
D1(ii)	Promote the production of other cereals and foodstuffs along with rice at local community levels.	2019 – 2023 100,000	• Research into improving variety and productivity in cereals and other food crop variety well advanced and producing desired results	MAFFS, IAR & NU
D1(iii)	Encourage small holder farmers to adopt agricultural practices that minimize biodiversity loss	2020 – 2024 50,000	• Improved farming practices result in increased fallow periods, greater yields and enhanced biodiversity.	MAFFS, IAR & NU

D1(iv)	Encourage investors utilizing crops for other uses than food production to embark on research into more efficient and environmentally sustainable practices	2020 – 2024 30,000	• At least two potential biofuel and/or other technologically viable crop variety identified through on-going research by relevant institutions • Investment into crop biotechnology show great future economic prospects	MAFFS, IAR, NU & FBC
D1(v)	Support and strengthen research institutions to carry out research and recover genetic resources lost over time and those beneficial to agriculture	2020 – 2024 1,000,000	• At least two research institutions receive funding to undertake research in agro-technology • Improve status of genetic resources achieved significantly in key ecosystem through recovery of species population and distribution	MAFFS, IAR & NU
D1(vi)	Train more personnel and provide logistics for more agriculture-related extension work	2020 – 2024 1,000,000	• Over 70% local farmers receive improved extension services • Local farming communities acquire improved skills and logistic resulting in improved crop yield.	MAFFS, IAR & NU
D1(vii)	Promote agroforestry techniques as an efficient land use practice	2019 – 2022 100,000	• At least one successful agroforestry programmes up and running in every district in Sierra Leone.	MAFFS, IAR & NU
D1(viii)	Increase support to community plant genetic resources conservation	2020 – 2022 50,000	• A report on the diversity and distribution of community plant genetic resource available to inform policy and action • A significant recovery of plant genetic resources, including 30% of all timber species achieved and proving benefit to local communities	MAFFS, IAR, NU & FBC

Strategic Output D2 **Animal Resources for Agricultural Husbandry are Effectively Harnessed and Managed for the Benefit of Biodiversity and People** **Aichi Targets addressed – Target 14 & Target 16. Total budget = $ 900,000.**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
D2(i)	Promote research into production of indigenous animal genetic resources	2020 – 2026 100,000	• Greater productivity realised from the application of the findings of studies of indigenous animal genetic resources.	MAFFS, IAR, SLARI& NU
D2(ii)	Enhance and promote appropriate animal husbandry practices and restocking with improved variety and veterinary services	2020 – 2026 200,000	• Improved capacity for animal husbandry and veterinary services attracting greater investment and economic viability in such agri-business ventures. • On-going and improved research ventures result in the introduction of improved and economically viable animal breeds in local and industrial animal husbandry	MAFFS, IAR & NU
D2(iii)	Encourage farmers production towards non-conventional indigenous animal genetic resources and encourage agro-silvo-pastoral system in range management	2020 – 2025 50,000	• Well-established and viable non-conventional indigenous agro-silvo-pastoral range management system creating more employment opportunity in the agricultural sector `	MAFFS, IAR & NU
D2(iv)	Demarcate and designate specific grazing areas in every chiefdom	2020 – 2022 50,000	• Grazing becomes a well-organised and sustainable activity that pose little threat to biodiversity	MAFFS, IAR & NU
D2(v)	Enhance government support to animal production activities and extension services	2019 – 2023 500,000	• Funds secured to provide training and empowerment to local farmers in animal husbandry • NGOs and Civil Societies support significantly improved access to relevant extension services.	MAFFS, IAR & NU

Strategic Output D3 **Land Resources for Agriculture are Effectively Harnessed and Managed for the Benefit of Biodiversity Conservation and People.** **Aichi Targets addressed – Target 14 & Target 15. Total budget = $ 1,590,000..**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
D3(i)	Review the land use policy and legislation taking into consideration land ownership;	2019-2022 70,000	• The review document available and useful in influencing changes in cultural attachment to land • Cultural ownership to land no longer becomes an impediment to biodiversity conservation	MAFFS (FD) NPAA, MLCPE & MLGRD
D3(ii)	Strengthen the human and institutional capacity of those agencies involved in land use management that promote practices favouring biodiversity conservation	2018 – 2022 1,000,000	• Biodiversity conservation is a vital component of the activities of relevant agencies. • At least two relevant MDAs receive the relevant capacity building support	MAFFS (FD) NPAA, NGOs, EPA
D3(iii)	Develop and enforce required policy and legislation to discourage all illegal land-based activities leading to biodiversity loss	2018 – 2020 200,000	• Land use activities are designed and implemented in ways that are geared towards biodiversity conservation	MAFFS (FD) & NPAA, MLCPE Local authority, CSOs
D3(iv)	Promote and encourage integrated land use and management system	2018 – 2020 20,000	• Report on potential integrated land use and management systems available • Adapted integrated land use and management system are beneficial to biodiversity conservation.	MAFFS (FD) NPAA, MLCPE & MLGRD
D3(v)	Optimise land use by categorizing land based on their productive capacity	2018 – 2020 300,000	• A report on productivity-oriented categorisation of land produced being implemented and influencing policy and action. • Land use maps based on productive capacity produced	MAFFS (FD) NPAA, MLCPE & MLGRD

Strategic Output D4 **Indigenous Knowledge and Intellectual Property Rights Well Harnessed within Local Communities and Producing Beneficial Results** **Aichi Target addressed – Target 16. Total budget = $ 530,000.**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
D4(i)	Undertake a comprehensive study on indigenous knowledge and practices among local communities for the conservation and sustainable use of biodiversity;	2018 – 2019 300,000	• Study report available and being applied to influence knowledge. • Beneficial rural and pro-poor conservation practices identified and undergoing further development with positive result for biodiversity	MAFFS (FD), EPA, NPAA & the Universities
D4(ii)	Review and update existing legislation on intellectual property rights to internationally acceptable standards on the conservation and sustainable use of biodiversity	2018 – 2020 10,000	• Legal and practical protection exists and is being implemented for indigenous originators and innovations of elements or concepts on biodiversity conservation, including the enforcement of the Nagoya Protocol by 2020	MAFFS (FD), NPAA, MLGRD & NGOs
D4(iii)	Promote public awareness about intellectual property rights and rewards in conservation and sustainable use of biodiversity	2018 – 2020 20,000	• Proper understanding and application of IPR is explored and potentially creating benefit to rural communities	MAFFS (FD), NPAA, MLGRD & the Universities
D4(iv)	Promote customary biodiversity traditional resources management systems and indigenous knowledge of local communities.	2019 – 2020 200,000	• Traditional biodiversity conservation concepts and practices incorporated into local customary bye-laws in many chiefdoms and are being effectively applied.	MAFFS (FD), NPAA, MLGRD & NGOs

CBD STRATEGIC GOAL E:

ENHANCE IMPLEMENTATION OF CONSERVATION PROGRAMMES THROUGH PARTICIPATORY PLANNING, KNOWLEDGE MANAGEMENT AND CAPACITY BUILDING

NATIONAL STRATEGIC OBJECTIVE

IMPROVED SECTORAL AND PUBLIC INVOLVEMENT, AND ENHANCED EXPERTICE AND AWARENESS ARE CONTRIBUTING TO EFFECTIVE,RESULT-ORIENTEDPLANNING ANDEXECUTION OF CONSERVATION PROJECTS AND PROGRAMMES

Strategic Output E1
Diverse Capacities for Effective Implementation of National Biodiversity Programmes Built and Being Utilised.
Aichi Target addressed – Target 17. Total budget = $ 5,560,000.

	Strategy or Action	Time frame & Cost ($)	Key Indicators	Responsible Partners
E1(i)	Carry out training needs assessment for professionals and extension staff in all the sectors responsible for the implementation of the NBSAP	2019 – 2022 10,000	• A comprehensive training needs assessment report available • A complete catalogue of technical and professional staff exists for effective implementation of sustainable biodiversity conservation programmes	MAFFS (FD), EPA, NPAA & the Universities
E1(ii)	Enhance institutional capacity for biodiversity conservation	2019 – 2022 1,500,000	• An Institute for biodiversity conservation studies established at university level and functioning to train personnel in various biodiversity conservation themes.	MAFFS, MEST, NPAA, the Universities
E1(iii)	Develop the human resources capacity through appropriate training on biodiversity management	2019 – 2026 1,000,000	• Relevant professional and managerial capacity built and progressively contributing to improving the biodiversity landscape	MAFFS (FD), EPA, NPAA, the Universities

E1(iv)	Establish and strengthen support facilities for biodiversity management	2019 – 2026 2,000,000	• Appropriate and effective in-situ and ex-situ administrative and logistic arrangements are leading to sustainable management of biodiversity.	MAFFS (FD), EPA, NPAA
E1(v)	Strengthen the financial resource capacity of both government and private sector involved with sustainable use and conservation of biodiversity	2019 – 2025 50,000	• Adequate funding available for biodiversity programmes. • Training in project funding proposal development achieved and yielding funding for biodiversity programmes	MAFFS (FD), EPA, NPAA, Relevant NGOs
E1(vi)	Strengthen the capacity of the existing research institutions to train the required personal and to conduct research on all aspects of biodiversity conservation	2019 – 2023 1,000,000	• Relevant tertiary institutions effectively engaged in research on various biodiversity themes • Adequate number of professional and technical staff, including at least 30% women, available and are producing sound research reports.	MAFFS (FD), EPA, NPAA, & the Universities

Strategic Output E2 **Public Participation on Biodiversity Conservation Significantly Improved and Making Positive Impacts.** **Aichi Target addressed – Target 18.Total budget = $ 2,110,000.**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
E2(i)	Establish a clear policy and legislative framework for local community participation in all biodiversity activities	2019 – 2020 10,000	• Community-participation made effective and more productive for biodiversity due to effective policy and legislative actions	MAFFS (FD), EPA, NPAA & MLGRD
E2(ii)	Promote and enhance local community involvement in biodiversity management and provide financial support to youth programmes that enhances biodiversity conservation;	2019 – 2026 2,000,000	• Local community groups in each province acquire the capacity to attract funding and support, and are engaged in biodiversity conservation work • Workable co-management systems for wildlife management with at least one local community	MAFFS (FD), EPA, NPAA, MLGRD & MYA

			empowered in each of the provinces	
E2(iii)	Adopt participatory approach to conservation at all levels of society, including chiefdom and village management committees	2019 – 2025 100,000	• Participatory management at community levels is producing the desired biodiversity conservation-oriented results.	MAFFS (FD), EPA, NPAA & MLGRD

Strategic Output E3 **Planning for Biodiversity Conservation Becomes a Significant Part of Sectoral Programme of Activities.** **Aichi Target addressed – Target 17. Total budget = $ 1,400,000.**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
E3(i)	Strengthen and equip the established biodiversity planning unit within the newly established National Protected Area Authority (NPAA)	2019 – 2023 1,000,000	• There is effective planning and administration of biodiversity conservation programmes.	MAFFS (FD), EPA, NPAA & MLGRD
E3(ii)	Incorporate biodiversity planning into sectoral policies programmes and activities.	2018 – 2025 100,000	• Policy decision and actions for biodiversity at sectoral levels are founded on plans and programmes of the relevant sector. • Biodiversity-related activities become regular in the programmes of at least four sectoral agencies.	MAFFS (FD), EPA, NPAA, MLCPE & MMMR
E3(iii)	Adopt a participatory approach to biodiversity planning and decision making at all levels.	2018 – 2026 300,000	• Overlapping mandates and conflict of interest issues on biodiversity are resolved through inter-agency collaborations.	MAFFS (FD), EPA & NPAA

Strategic Output E4 **Access to Technology and Handing of Biotechnology is Made Effective and Beneficial to Local Biodiversity Programmes.** **Aichi Target addressed – Target 19. Total budget = $ 130,000.**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
E4(i)	Assess the legal requirements for the transfer of technologies to Sierra Leone	2018 – 2019 5,000	• Practical international technological experience exchange and knowledge transfer effected and influencing local approach to biodiversity conservation efforts	MAFFS (FD), EPA, NPAA & Min. of Justice
E4(ii)	To review and update existing sectoral patent laws of sierra Leone	2018 – 2019 10,000	• Applicable sectoral policies and legislation on patent relating to biodiversity available and enacted.	MAFFS (FD), EPA, NPAA & Min. of Justice
E4(iii)	Identify and strengthen the capacity of existing institutions for biotechnology risk assessment including introduction of genetically modified living organisms	2018 – 2022 100,000	• A biotechnology risk assessment study carried out and report available • Improved level of biotechnology studies at tertiary institution positively impacting capacity for risk assessment.	MAFFS (FD), EPA, NPAA, FBC & NU
E4(iv)	Establish a legal framework for the regulation of biotechnology	2018 – 2019 15,000	• No unsuitable GMO products that pose threat to local biodiversity is allowed to be introduced in Sierra Leone, due to the application of relevant legislation.	MAFFS (FD), EPA, NPAA & Min. of Justice

Strategic Output E5 **Financial and Budgetary Resources for Biodiversity Programmes Mobilised and judiciously utilised.** **Aichi Target addressed – Target 20. Total budget = $ 1,220,000.**				
	Strategy or Action	**Time frame & Cost ($)**	**Key Indicators**	**Responsible Partners**
E5(i)	Promote an increase in sectoral budgetary allocation from GOSL for biodiversity conservation;	2018 – 2020 10,000	• There is strong commitment from the executive and legislative arms of government result in inclusion of at least one environmental/biodiversity component as a mandatory requirement for budget approval. • There is at least 50% increase in government sectoral funding for biodiversity-related programmes and activities, thus creating positive impacts	MAFFS (FD) , EPA & NPAA
E5(ii)	Promote ecosystem activities and projects that provide financial support for biodiversity work	2019 – 2026 50,000	• Ecotourism attraction to Sierra Leone increased by at least an average of 20% each year and contributing significantly to the national budget for biodiversity conservation. • At least two more viable innovative ecosystem services related ventures establish and beneficial to biodiversity	MAFFS (FD) , EPA & NPAA
E5(iii)	Develop a legislative framework incorporating user fees (licenses and royalties) for biodiversity exploitation and use	2019 – 2023 10,000	• Significant outcomes realised through funds raised each year through license and royalties and being invested in biodiversity programmes • An acceptable tax to cover footprint for companies whose activities impact biodiversity is introduced and enhancing funding for conservation.	MAFFS (FD) , EPA & NPAA

E5(iv)	Promote monitoring, control and surveillance schemes involving penalties for biodiversity transgressions.	2020 – 2026 1,000,000	• A monitoring protocol for the institution and implementation of penalties for biodiversity-related violations, developed and being used • All funds obtained as fines from violations channelled towards biodiversity conservation programmes	MAFFS (FD) , EPA & NPAA
E5(v)	Set up advocacy and support for adequate national and international technical and financial support for programs related to biodiversity conservation.	2018 – 2025 50,000	• Multilateral agencies and International NGOs increase their technical and financial support by at least 30%. to biodiversity conservation effort in Sierra Leone	MAFFS (FD) , EPA & NPAA
E5(vi)	Foster donor support through foundations and NGOs for biodiversity activities	2020 – 2026 100,000	• A foundation established through lessons learnt from the Gola Forest National Park experience. • Annual national donor conference organised to raise funds in-country and externally for biodiversity programmes.	MAFFS (FD), NPAA, & NGOs

Grand total of the proposed budget for the implementation of the NBSAP 2017-2026 = **$ 49,810,000**

SECTION IV

IMPLEMENTATION OFTHE NBSAP 2017-2026

Introduction

The development of an NBSAP is only the start of a long path towards the achievement of an ecologically sound and biodiversity rich natural environment. It would therefore require the collaborative effort and commitment from partners, state actors and supporting organisations to achieve the goals and objectives of an NBSAP. It has been a perennial problem that in many instances very well developed policies, strategies and plans in the environmental sector have not been utilised to the fullest and in the process gaps and lapses in programmes have led to virtually irreversible consequences such as loss of vital habitats for species, loss of vegetation and a degraded environment.

One typical example of such failed policies is the green belt programmes which was much publicised, received much support from government, but was not well implemented because of lack of commitment and will to pursue its objectives to the fullest. Today the hills overlooking Freetown are almost bear of vegetation, occupied mostly by unbridle housing development and is creating seriously devastating environmental conditions in down town Freetown and the coastline. The documentary film *Lost Freetown* describes how a once ecologically viable Freetown environment has been devastated by failed policies, lack of action, weak political will and ineffective law enforcement.

This section elaborates on how the NBSAP 2017-2026 can be implemented in a sustainable way that would ensure that the outputs and outcomes of the process are realised and beneficial to present and future generations.

Funding and Administration of the NBSAP

Over the years, the GoSL has always had significant deficit in its annual budget amounting to billions of Leones. The budget estimate for environment-related activities is not directly known, but the operational budget for environment agencies such as the EPASL, the NPAA and Forestry Division (MAFFS) are subsumed in the allocation for their various supervisory bodies and ministries. Invariably, the actual fiscal allocation to these bodies and ministries do not adequately cover all the programmes and projects they undertake, including environment issues. This manifests the fact that the country lacks adequate finance to fund its environment and biodiversity programmes.

The question of where the additional funds for the NBSAP come from is definitely not have quick and ready answer. Fortunately there has been strong commitment from international partners and multilateral donors to provide full or matching funds for the conservation of the biodiversity in the country, including funding to ministries and agencies for their respective

internal programmes. Some of the key organisations and their biodiversity-related funding targets are given in Table 11.

Table 11 – List of Organisation that would potential fund the NBSAP 2017-2026

Organisation providing funds	Target Projects since 2004
UNEP	NBSAP 2004-2010 and Review NBSAP 2017-2026
World Bank	Sierra Leone BCP and WCP
UNDP/GEF	GEF-IBA Project
European Union	WAPFoR Conservation Project
World Wildlife Fund for Nature	Tiwai Island Conservation Project
RSPB	Gola Forest National Park establishment
BirdLife International	IBA Programme
Conservation International	Tiwai Island Conservation Project
US Fish and Wildlife	Marine Turtle Conservation in Sierra Leone
Wetlands International	Surveys of waterbirds
Ramsar Secretariat	Technical support to wetlands conservation
CITES Secretariat	Training for Prevention of Wildlife Trafficking
Disney World Conservation Trust	Picathartes survey and conservation at the WAPF

By implication, international donors provide much of the need funds for biodiversity action, particularly in-situ conservation programmes in Sierra. This list of organisations together provides the foundations upon which the funding for NBSAP 2017-2026 can be mobilised. The GoSL, its implementing agencies and in-country partners has the responsibility to build trust and promote partnership through ensuring strong fiscal management and commitment to its national and international environmental legislation.

The administration of the NBSAP and related activities would depend on what future plans and programmes government might have in terms of organising and managing of its environment and protected area infrastructure. However for the sake of expediency, there is need to ensure that that initial resources and mechanisms for the implementation of the NBSAP are in place and functioning to kick-start the process. In most of the workshops conducted there many suggestions were made that a unit be established within the EPA or the NPAA to coordinate the activities of the NBSAP. The lack of a proper coordinating mechanism is partly to be blamed for the lapses in the implementation of the NBSAP 2004-2010. Setting up and/or operationalizing the following units is vital to the administration of the NBSAP 2017-2026 as given in Section III:

- NBSAP 2017-2026Technical Committee – comprising 21 members from government agencies, the Universities, NGOs and funding partners.
- NBSAP Implementation Coordination hosted by the EPA or NPAA
- NBSAP Regional Steering Committees comprising government agencies, NGOs and CBOs that are active in the respective regions.

Institutional and Legislative Provisions

The NBSAP development and implementation process started on a god foundation, which needs to be continued and built upon. A National Steering Committee was set up for the 2004-2010 NBSAP comprising representatives from government MDAs, NGOs and the University, which provided policy, technical and moral support to the secretariat. Such strong institutional support ensured that the NBSAP process achieved its purpose and objectives within the given time-frame. However, the Committee was unable to continue its support to the implementation process because of lack of funding and motivation over the years. This issue requires attention within the framework of support to the monitoring and evaluation of the progress of the NBSAP 2017-2026, in order to ensure that the work of the National Steering Committee is sustained and effective over the period of implementation of the Plan. The composition of the Committee will work in tandem with the Board of Directors of the EPA and the NPAA, which will have strong representative in the Steering Committee

The proposed 14 member National Steering Committee for the implementation of the NBSAP 2017-2026 shall comprise of key individuals and representatives from institutions listed in Table 12. The Chairman to be appointed to the Committee will constitute its 15th member

Table 12 – List of 21 proposed Members of the NBSAP Implementation Steering Committee

Category	Agency/Organisation/Institution	No. of Reps
MDAs	Environmental Protection Agency	2
	National Protected Area Authority	1
	Forestry Division MAFFS	1
	Agriculture and Food Security Division MAFFS	1
	MLCPE	1
	Ministry of Fisheries and Marine Resources	1
	Ministry of Local Government and Rural Development	1
	Strategic Planning Unit – State House (GOSL)	1
Academic Institutions	Department of Biological Sciences, FBC,USL	1
	Department of Biological Sciences, NU	1
NGOs	Conservation Society of Sierra Leone	1
	Environmental Foundation for Africa (EFA)	1
Representative from Civil Society		1

The GOSL albeit with its inadequate budget, has over the years provided significant support to the environment and conservation sector in various ways. Many policies, legislations and regulations have been developed and passed into law as a manifestation of government's commitment to both national and international drive to conserve biodiversity. This is an important strength and capacity inherent in the GOSL governance mechanism that can use most effectively to cater for the environmental and biodiversity protection needs of the

country. In terms of the NBSAP2017-2026, focus should be given to the review of policies legislation and regulations consistent with current and future challenges and emerging concepts, as highlighted in the strategy given in Section III. From the strategy a number of priority legislative actions expected are outlined in the Box3below:

Box 3 – List of Priority Legislative actions expected during the NBSAP 2017-2026 implementation

- The enactment of the draft reviewed and amended 1972 Wildlife Conservation Act and its Regulations of 2015
- The enactment of the draft reviewed and amended 1988 Forestry Act and its Regulations of 2015.
- Enactment of the newly draft Wetlands Conservation Act and its Regulations of 2015
- A review of the Mines and Minerals Acts of 2008 to incorporate biodiversity conservation considerations.
- Introduction of policy, guidelines and regulations that incorporates biodiversity into urban development.
- Review of GoSL's decentralisation policy to include a strong biodiversity component.
- Development of policy and regulations for the utilization and conservation of inland wetland ecosystems.
- Review of the land tenure and ownership system with the purpose of ensuring strong element of land preservation for biodiversity.

The process of reviewing of policies and enactment of legislations in most instances has strong policy and political considerations. However it is important that the interest of the environment, its benefit to posterity and the overall national interest must override political consideration and conflict of interest in order to promote the conservation interest and make the objectives of the NBSAP achievable. Much of the responsibility lies of the various agencies and ministries of government that are in the position to initiate and drive the process at every stage. One of the impediments to the promotion of policy legislative action is the lack of clear-cut understanding of the responsibility of the various agencies of government, exacerbated by conflicting roles and overlapping mandates. This a strong argument for the organisation and institution of an inter-agency forum with the primary purpose of building consensus among key government partners to resolve the issue of overlapping mandates and conflict of interest. The NBSAP implementation process provides an opportunity for such long-overdue interagency consultations, which has been a regular point of convergence in most recommendations from meetings and workshops on environmental and biodiversity issues. The EPASL is well-positioned to coordinate and organise an outcome-oriented meeting between the relevant agencies and other stakeholders

The Board of Directors of every agency established such as the EPA, NPAA, and the relevant Parliamentary Committees, which are mandated to provide policy direction to these agencies, have the capacity to promote relevant policies and legislations relating to biodiversity conservation. The overlapping mandates as given in the various acts can be looked upon as areas of potential inter-agency collaboration rather than causes conflict of interest and such possibilities can be promoted by the various boards of directors. Wherever there is a diversity of interest from various stakeholders, there is bound to be divergence of views and struggle for authority and resource control. However, with effective consultation and strong collaboration between agencies at different levels, policy development and legislative process can be readily expedited, if the right information is available and well disseminated.

From concept to policy and eventually to legislations, processes have to be followed. Sometimes the processes are stalled because of lack of consultation and problem of disagreement on inter-agency policy divergence. Based on discussions and recommendations from the regional and national workshops, it is necessary that established mechanism for the development of a concept into a workable and implementable policy or legislation be published. A major opportunity is the general willingness expressed by representative from the relevant government agencies to collaborate and support proposed policy and legislative processes required for the effective implementation of the NBSAP. The following is a strategy to be implemented to address policy, legislation and interagency collaboration for biodiversity conservation:

Data Coordination and Clearing House Mechanism

The concept of a clearing house has been a much discussed topic in many technical fora and programmes hosted by government and other partners respectively. It is one of the major administrative infrastructures of the NBSAP recommended by the 10th Conference of Parties of the CBD and is consistent with the general thinking among stakeholders in the biodiversity conservation community in Sierra Leone. A clearing house mechanism will contribute to the effective implementation of the NBSAP and support other environment and biodiversity programmes through the following ways:

- Establish an organise system of data collation, storage and retrieval.
- Provide easy access to data that may be required to inform policy and decision making.
- Ensure that there is consistent updating of data in order to facilitate easy assessment of trends in biodiversity status in the medium to long term.
- Ensure that the outcomes and result of data processing are effectively disseminated
- Identify experts in various thematic areas and constantly engage them.
- Identify training and development needs for efficient data handling, storage and retrieval.

However, identifying a clearing house, setting up of the mechanism and operationalizing it requires significant human and equipment resource inputs. Many academic institutions and other agencies and NGOs have conducted research in diverse thematic areas, ranging across the major groups of flora and fauna. Some of the institutions involved in recent thematic research and their collaborative networks are given in Table 13.

Table 13 – Actual and Potential Areas of Expertise and Collaboration between institutions involve in the NBSAP

Organisation	Research Area	Collaboration with
Forestry Division (MAFFS)	Forestry and Agroforestry	FBC (USL) and NU
Wildlife Conservation Branch (now part of NPAA).	Chimpanzee, Elephant. Collaborated with Tacugama	Chimpanzee Rehab Centre
Biological Sciences Department (FBC, USL)	Birds, Butterflies, Large and Small Mammals and Plants	NU, CSSL, FD (MAFFS).
Biological Sciences Department (NU)	Primates, Large Mammals and Plants	FD (MAFFS), CSSL & FBC
Institute of Marine Biology and Oceanography (IMBO, FBC	Fish, Fisheries and Aquaculture	MFMR,
Conservation Society of Sierra Leone (CSSL)	Birds and Habitat Conservation	FBC, NU, FD (MAFFS)
Tacugama Chimpanzee Rehabilitation Centre	Chimpanzee and Large Mammals	CSSL, FD (MAFFS)
Reptiles and Amphibians Programme, Sierra Leone	Herpetology (Amphibians and Reptiles).	FBC, BWMA
National Protected Areas Authority	REDD, REDD+	Forestry Division, FBC.

With this network of research institutions, their diversity of taxa and themes, and the level of collaboration that exists between them, there is ample opportunity to address the research and documentation needs of the NBSAP. Detailed information on the work done by environmental NGOs in Sierra Leone can be obtained from the *Fifth National Report to CBD*. A clearing house mechanism would ensure effective coordination, sharing and use of data and information between and among organisations. Proper management of data would obviously lead to the effective use of the same for the intended purpose. A clearing house would also encourage collaborative research opportunities, which are platforms where people from various institutions exchange ideas, learn from each other and build experience for future research challenges.

Communication and Public Participation

In order to effect the dissemination of the activities of the NBSAP 2017=2026 to stakeholder and the general public a communication strategy should be developed as one of the auxiliary documents to this plan. An effective communication system will not only attract interest from stakeholders and other interest groups, but will also and ensure open access to the

information generated during the process, for the benefit of all. Public participation in biodiversity management is often ensured in the following areas:

- Ordinary Meetings (planning meetings, disclosure of studies, field visits by authorities etc), especially during the popularisation of ESHIA reports.
- Meeting of partners and collaborators at local community, chiefdom, district and provincial and national levels for awareness raising, decision making, consent and acceptability at these levels prior to the implementation of ESHIA reports, the designation of site for protection and the exploitation of resources.
- Radio/TV Programmes (Involvement in discussion programmes; Public notices; meet the peoples tours; visits to Forestry offices in Freetown and district offices; responses to direct interviews and through administered questionnaires.
- Workshops (Sensitization/ Awareness-raising workshops; Planning workshops, Introduction of projects, Project inception workshops, steering committee meetings etc).
- Publicising National Tree Planting Day exercises and other tree planting ceremonies organized by the Forestry Division, the Environment Division of MLCPE and the EPASL in collaboration with NGOs and Civil Society groups.
- Disseminating information and successes of co-management arrangement for the protection of sacred grooves and the conservation of secret society bushes, places of worship, burial grounds (cemeteries) and critical biodiversity areas. Such community level participation was established during the implementation of the SLWCP at the Mamunta-Mayosso Wildlife Sanctuary and the Lake Sonfon Conservation Project.
- Regular and widespread publication of newsletters, leaflets and brochures of NBSAP programmes, activities and achievements.

However, in practice, the involvement of stakeholders (local communities, civil society, NGOs) in policy development and implementation in biodiversity management is often inadequate. The availability of practical strategies and mechanism to attract civil society involvement and the lack incentives to promote public participation in biodiversity conservation are issues yet to be addressed. The NBSAP provides the appropriate platform to enhance collaboration at all levels and promote local community participation. An important approach would entail the development of a Community Action Plan (CAP) to be jointly implemented with local stakeholders, comprising key components as follows:

- Community outreach and awareness through strategic local and national communication programs that will include contributing to schools curricula, preparing information materials, extension by field staff, and developing nature clubs;
- Conservation-linked community development through the preparation and implementation of actions to identify priority threats to biodiversity conservation in each site and explore options for addressing them.
- Providing training for developing income-generating activities and supporting potential small-scale entrepreneurs to develop business plans and partnerships in support of conservation-linked investment initiatives;

- Supporting local practices for sustainable land use including such ventures as the introduction of energy-saving technologies to reduce unsustainable dependency on natural resources, especially fuel wood.
- Strengthening linkages with government programs and service providers (such as Farmer Field Schools.

Monitoring and Evaluation of the NBSAP

Monitoring is an essential tool for the assessment of progress in any system and the NBSAP is not an exception. The NBSAP process does not end with the implementation of activities, but it is important that these activities are monitored and evaluated against their indicators and the achievement of the stated targets within the given time frames. Monitoring is normally an on-going process which starts after the commencement of the project or programmes and ends some months or years after the completion of the project or programme. In terms of the monitoring of NBSAP 2017-2026, it would be more prudent to develop a monitoring and evaluation plan which would be implemented once a year, the result of which would feed into effective planning and/or modification of activities for subsequent years. If well implemented, such a process would ensure proper assessment of the successes and challenges of the strategy in an organised and informative fashion, and enhance learning and experience sharing among participating partners.

Monitoring rests on the shoulders of all key stakeholders, but the process must be led by the EPA and the NPAA, which are the agencies that have the mandates to uphold and implement government policies. Their functions in monitoring is dependent upon how well they guide and direct policies towards promoting biodiversity. Both the EPA and the NPAA have monitoring and evaluation units with the relevant capacities and expertise, but these units must shift their focus from mere reconnaissance to actual scientific work, supported by real-time data. The Universities, particularly USL and NU, are equally useful partners in monitoring and evaluation, because they usually have the expertise and the analytical capacity to present the findings in a scientific, but comprehendible manner. Additionally, NGOs such as the CSSL and EFA could provide technical support in relevant areas. The EPA and NPAA as the key custodians of the NBSAP, should exhibit willingness to organise and coordinate monitoring activities.

Monitoring of the NBSAP must be aligned with other national development strategies, national policies and international biodiversity conventions, agreements and programmes. This is to ensure that the implementation of the NBSAP is not done in isolation, but holistically addresses biodiversity issues across the board. The functions, programmes and activities of every ministry, departments and agencies (MDAs) of government related to the environment and associated resources have direct or indirect relationship with the NBSAP. The extent to which these work of these MDAs affect the NBSAP is a subject for monitoring, especially in terms of addressing issues of overlapping mandates and conflict of interest.

The box below outlines the key national and international strategic and regulatory components with which the NBSAP monitoring should be aligned. It is by no means an exhaustive list because there are many other environment and development related plans and programmes consistent with the tenets of the NBSAP that have been developed and being implemented by other government MDAs, NGOs and international partners working in Sierra Leone (see the 5th National Report to the CBD for more details).

Box 4 - List of national and International Strategic and Regulatory Components aligned with the NBSAP 2017-2026

National Components

- The 2008 EPA Act and its Amendments of 2010
- The 2012 NPAA Act and Regulations.
- The 1988 Forestry Act and Regulations, and its 2015 reviewed version.
- The 1972 Wildlife Conservation Acts and Regulations and its 2015 reviewed version.
- The 2004 Fisheries Management and Development Act and its Amendments of 2007.
- The 2006 National Adaptation Programme of Action for Climate Change
- The 2004 Mines and Mineral Acts and Regulations and its amendments of 2009.
- The newly drafted Wetlands Act and its Regulations.
- The Agenda for Prosperity 2013-2035 (PRSP III).

International Components

- The CBD Archi Targets
- The 2030 Sustainable Development Goals
- CITES Regulations and its Appendices
- IUCN Red List of Threatened Species
- The Ramsar Convention and its Regulations on Wetlands

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APPENDIX I

NATIONAL STEERING COMMITTEE FOR THE REVIEW OF THE NBSAP

Categories	Name of MDAs, Organisations and Civil Society
NBSAP Secretariat	Chairperson, EPASL: Chairman Steering Committee
	Project Coordinator NBSAP/CBD
	Project Assistant NBSAP/CBD
	Secretary - NBSAP/CBD
MDA's	
	Ministry of Finance and Economic Development
	Director of Agriculture, MAFFS
	Director of Forestry, MAFFS
	Ministry of Lands, Country Planning and the Environment
	Director of Mines
	Director LWDD
	Director – Fisheries and Marine Resources
	Ministry of Water Resources
	Ministry of Energy
	Director, Petroleum Directorate
	National Minerals Agency
	Director/rep - Tourism
	Director, NPAA
	Representative/Permanent Secretary MAFFS
	Director Planning, Monitoring and Evaluation Division
	Ministry of Information and Communications
	Ministry of Internal Affairs
	Department of Agricultural extension
	The CBD Focal Point
	Representative, Parliamentary Oversight Committee for the Environment
	Representative Parliamentary oversight committee for the Fisheries and Marine Resources
	Representative Parliamentary Oversight Committee for the Forestry
	Joint Operating centre (JOC) of the Naval Wing
	Sierra Leone Maritime Administration
NGO's & INGOs	
	Programme Officer/Rep, FAO
	Representative, National Association of Farmers
	Director Environmental Foundation for Africa EFA
	Conservation Society of Sierra Leone CSSL
	Green Scenery
	National Museum
	Tacaguma Wildlife Sanctuary
	Loma Offset Program
	Gola Forest Program
	Wetlands Program (PRCM)
University	

	Department of Biological Sciences, FBC, USL
	Department of Biological Sciences, NU
	Department of Agriculture, NU
	Institute of Marine Biology and Oceanography, FBC, USL
	Department of Geography, FBC, USL
	Director, Rice Research Station
	Department of Fisheries and Wildlife, NU
	School of Forestry and Horticulture, NU
	SLARI, NU
Funding Agencies	
& Sponsors	Representative, UNDP
	Representative, FAO
	Representative, World Bank
	Representative, European Union
Media	
	Sierra Leone Broadcasting Corporation

ANNEX II

KEY CONSULTANTS AND CONTRIBUTORS TO NBSAPREVIEW

Consultant	**Presentation Topic**
Dr Ralph Bona (NBSAP Review Project Manager)	Overview of the NBSAP Revision and 5th National Report preparation
Prof Alghali, Retired VC, Njala University	Agricultural biodiversity, plant resources, livestock, land resources, farmland Aquaculture, agro-forestry and tree planting, gene banks
Prof A.B. Karim (USL)	Ecological restoration, and species recovery, control of alien species, biodiversity planning
Prof Ndomahina, University of Sierra Leone (USL).	Aquatic Biodiversity, Marine and coastal biodiversity
Dr. Arnold Okoni-Williams (USL)	Diversity of terrestrial, aquatic and marine avifauna -
Mrs Kate Garnett (Head Wildlife Department, Forestry Division MAFFS).	Forest Biodiversity, Game reserve, parks and sanctuaries, montane diversity; *In situ* and *ex situ* conservation
Mr David Suale (IT Consultant).	Access to technology, handling of biotechnology, information exchange and technical scientific co-operation
	Research and training, public education and awareness, indigenous knowledge and intellectual property rights
Mr Edward Aruna (RAP-SL)	Reptiles and Amphibian diversity
Mr Alhaji Siaka (Project Manager, SLBCP)	Wildlife conservation in Sierra Leone
Mr E.K. Alieu (former Director of Forestry)	Policy, Legislative and Institutional, capacity building, public participation incentives
	Sustainable use of biodiversity components, sharing of benefits arising from the use of genetic resources
Mr Mohamed Mansaray (Wildlife Department)	Relationship between CBD and other conventions, identification and monitoring
Mr Akintayo Alabi (Development Consultant)	Organizations, programs, budgets, human capacity (NGOs, companies)

APPENDIX III

LIST OF ORGANISATION REPRESENTATIVE IN WORKSHOP

WESTERN AREA

1	Ministry of Agriculture	16	Ministry of Lands
2	Ministry of Tourism	17	Standard Times
3	Reptiles and Amphibian Program-Sierra Leone	18	Green Scenery
4	Sierra Leone Broadcasting Cooperation	19	Food and Agriculture Organization
5	Ministry of Social Welfare, Gender and Children's affairs	20	Sierra Leone Ports Authority
6	Strategy and Policy Unit State House	21	CAN-SL
7	Environment Protection Agency-Sierra Leone	22	WA BiCC
8	Conservation Society of Sierra Leone	23	FBC-USL
9	Ministry of Fisheries	24	National Tourist Board
10	Institute of Marine Biology and Oceanography	25	National Protected Area Authority
11	Sierra Leone Maritime Administration	26	CASL
12	Conservation Alliance Sierra Leone	27	Freetown City Council
13	SLBC/ TV	28	Freetown Teachers College
14	MMMR	29	MLGRP
15	Njala University		

EASTERN REGION

1	ASJD-SL	18	**Forest Protection Organisation**
2	KNSCC	19	NMJD
3	WOME	20	KOLEPO
4	ISSK	21	WHH
5	Forest Reserve Staff	22	World VISION SL
6	Timber Association, Kenema	23	SLBC
7	IFAD	24	MWHI
8	Youth affair	25	SLP
9	Kono district Council	26	CEPO
10	MAFFs	27	KNSCC
11	ONS	28	KDC
12	DAO- MAFFs	29	NEW SONG
13	MEO	30	P.C Fasuluku
14	P/C Rep	31	NMA
15	Eastern Radio	32	Forest Conservation Association
16	MWR	33	Women Association
17	KDRO		

NORTHERN REGION

1	Kaina D C	18	MCC
2	SILNORF	19	MAFFS
3	CAUSE CANADA	20	Benevolent High School
4	SLCRA	21	CESAS
5	YAS CaT	22	NCPC
6	YPB Sierra Leone	23	PSNP
7	Develop Salae	24	HRCSL
8	Cotton Tree Foundation	25	SLBC Radio
9	SLBC TV	26	MCC
10	Alharrkan Sch	27	TDC
11	Afro National	28	MLGRD
12	MWFC	29	Radio Mankneh
13	ESCP	30	CWW
14	CARITAS	31	MLGRP
15	Tawalen Women	32	CAHSEC
16	EBK University	33	SNAP
17	ONS	34	MAFFS

SOUTHERN REGION

1	MET	17	MLG&RD/SDO'S OFFICE
2	SECA	18	SEDA
3	EMARC/SL	19	NAMATI
4	PEACE/SL	20	ANGLE/SL CSO
5	ACODI-SL	21	PICEP-SL KEN
6	MAPCO	22	SALWACO
7	EMI-SL	23	GREEN AFRICA
8	COBEP-SL	24	RISE
9	Radio New Song	25	SLBC BO
10	KAB/SL	26	KAKEN C/DEV
11	AFFA SL	27	STAR RADIO/TV
12	Praise Foundation	28	GIS SOUTH
13	ERI	29	WPTP
14	RFO Kenema	30	GRNP
15	MAFFS	31	GWFC
16	EPA-SL	32	CHUD-SL

APPENDIX IV

The Aichi Targets - The CBD New Strategic Approach to NBSAP

Strategic Goal A:

Address the underlying causes of biodiversity lossby mainstreaming biodiversity across government and society

Target 1

By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably

Target 2

By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Target 3

By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

Target 4

By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Strategic Goal B:

Reduce the direct pressureson biodiversity and promote sustainable use

Target 5

By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Target 6

By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Target 7

By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Target 8

By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Target 9

By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Target 10

By 2020, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Strategic Goal C:

To improve the status of biodiversityby safeguarding ecosystems, species and genetic diversity

Target 11

By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

Target 12

By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Target 13

By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Strategic Goal D:

Enhance the benefits to allfrom biodiversity and ecosystem services

Target 14

By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Target 15

By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

Target 16

By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Strategic Goal E:

Enhance implementation through participatory planning, knowledge management and capacity building

Target 17

By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

Target 18

By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Target 19

By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Target 20

By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

APPENDIX V

Summary of Issues and Gaps on Thematic and Sectoral Strategies

TERRESTRIAL BIODIVERSITY

Wildlife, Game Reserves, Parks and Sanctuaries

Issues and Gaps:

- Paucity of knowledge and data on wildlife biodiversity from various terrestrial ecosystems;
- Inadequate data on the classification of wildlife, taxa, species richness and abundance, degree of endemism and the vulnerability of major taxonomic categories in existing and proposed wildlife game reserves, parks and sanctuaries;
- Lack of proper inventory of national wildlife population;
- Low key participation by the community in wildlife management;
- Lack of monitoring and adequate law enforcement system in conservation work;
- Inadequate financial resources for government and private institutions for implementing wildlife management programmes;
- Illegal hunting activities;

Forest Biodiversity

Issues and Gaps

- Immense pressure due to urban expansion and increased population;
- Weak enforcement of forestry laws and regulations;
- Inadequate byelaws for the harvesting of forest products;
- Uncontrolled bush fires;
- Illegal logging activities;
- Inadequate public awareness on forest conservation issues;
- Tree felling for charcoal and firewood production;
- Inefficient farming practices
- Encroachment on forest reserves and protected areas for farming and housing;
- Inadequate knowledge on the regeneration of native tree species;
- Proliferation of unscrupulous industrial scale and artisanal mining activities;
- Inadequate of proper inventory of forest resources in the country;
- Uncontrolled and over-grazing;
- Proliferation of power chain saws in the felling of forest trees;

Agricultural Biodiversity (Plant and land resources)

Issues and Gaps

- Inadequate capacity on the part of small holder farmers to change and adopt new farming practices instead of shifting cultivation involving slash-and-burn agriculture
- The extension of mining concessions to include arable land;
- Decline in the traditional use of crops for other purposes such as medicine, dyes and ornaments;

- Land degradation due to poor land management;

Agricultural Biodiversity (livestock Resources)

Issues and Gaps

- Inability to recover livestock since the 2003 NBSAP;
- Poor animal husbandry;
- Inadequate support services in the veterinary services;
- Conflicts between livestock owners and crop farmers over grazing;

Agricultural Biodiversity (land Resources)

Issues and Gaps

- The lack of comprehensive up-to-date land use policy and legislation
- The continuation of the current land tenure system;
- Insufficient knowledge and information of the nature and extent of land degradation
- Poor coordination of land use activities, such as urban planning, mining, agriculture, and waste disposal;
- Inadequate resources and logistical support for land use planning and monitoring;
- To conduct extensive and periodical land use mapping;

AQUATIC BIODIVERSITY

Inland/Freshwater Ecosystems

Issues and gaps:

- Inadequate political and institutional framework for the management of inland water ecosystems;
- Changes in water quality and hydrology due to mining, hydroelectric power generation, urbanization, commercial farming and waste disposal;
- Loss of wetland resources to population increase and migration, urbanization and mining;
- Overlapping and conflicting mandates among old and emerging agencies responsible for the management of inland ecosystems;
- Inadequate financial support to agencies (government and NGO) managing inland water ecosystems;

Coastal and Marine Biodiversity and Fisheries

Gaps and Issues

- Lack **o**f up–to–date information on the status and the trends on the biodiversity of the coastal and marine biotopes;
- Degradation/fragmentation and loss of seabed integrity due to activities such as coastal infrastructural development fishing, sand mining, dredging and agriculture;
- Over–exploitation of commercial species especially fishes through increasing pressure and poor and illegal fishing practices;

- Uncontrolled introduction of pollutants (solid waste, sewage and toxic chemicals into the coastal environment;
- Lack of integrated approach to the management of coastal and marine areas
- Inadequate support to enforce the protection of designated marine and coastal protected areas;
- Lack of an efficient monitoring control and enforcement mechanisms against marine transgressions;
- Lack of appropriate legislation for the protection of vulnerable/endangered wetland;

GENERAL MEASURES (CROSS-CUTTING ISSUES)

The section that follows summarizes proposed strategies for biodiversity under the main cross-cutting issues and as follows:

Policy, Legislative and Institutional Measures

Issues and Gaps:

- Inadequatenational policy and legislation that addresses biological diversity;
- Insufficient manpower, infrastructure and other support facilities for the implementation of biodiversity programmes;
- The rapid urbanization of major towns across the country, including the extreme pressure exerted on the Western Area Peninsula reserves;
- Inadequate guidelines, for biodiversity conservation;
- Weak policy and legislation on a coordination mechanism for biodiversity utilization and conservation;
- Inadequate National and International Technical and Financial support for biodiversity programmes;

Capacity Building

Issues and Gaps:

- Few highly trained personnel especially scientists to undertake biodiversity programmes;
- Inadequate financial resources;
- Inadequate support facilities, such as libraries, laboratories and equipment
- Inadequate capacity to overcome research problems (taxonomy, ecological complexity)

Public Participation

Issues and Gaps

- Insufficient involvement of local communities, especially the youth in the management of biodiversity;
- Inadequate awareness raising and advocacy activities among the government agencies and NGOs for public participation in biodiversity management;
- Lack of specified policy and legislation requiring public participation in biodiversity activities and,

- Lack of incentives to promote public participation in biodiversity and conservation.

Biodiversity Planning

Issues and Gaps:

- Inadequate comprehensive biodiversity planning in sierra Leone;
- Lack of specific provisions for planning at sectoral levels, and;
- The Environment Protection Agency Act, 2008 and its complementary 2010 made no specific reference to environmental planning;

Identification And Monitoring

Issues and Gaps

- Lack of an up-to-date comprehensive policy and legislative framework for identification and monitoring of components of biodiversity;
- Lack of information on trends that affect the integrity of the ecosystems; and
- Lack of specific guidelines for identification and monitoring of biodiversity in the existing conservation related programmes.

In-situ Conservation (In Protected Areas)

Issues and Gaps

- Poor coordination amongst various institutions whose activities relate to managing protected areas;
- Inadequate information on the current status and trends of protected areas;
- Inadequate training and manpower capacity to manage protected areas, and;

In-situ Conservation (Outside Protected Areas)

Issues and Gaps:

- About 98% of the biodiversity of sierra Leone lies outside the protected areas:
- Lack of adequate knowledge of published and unpublished materials on biodiversity of regions outside of protected areas;
- Lack of adequate scientific knowledge of the ecology of the species in the various ecologies in the areas outside of PAs;
- Lack of management plan for the ecologies outside of the PAs ,and;
- Ineffective law enforcement outside protected areas to combat land grabbing;

Ecological Restoration and Species Recovery

Issues and Gaps:

- Insufficient knowledge of the provisions of articles 8(f) of the CBD relating to the ecological restoration and species recovery;
- Although the EPASL demands a rehabilitation plan for all projects with substantial impact on nature, it remains to be seen whether this will be put into effect;
- Inadequate manpower capacity and enforcement mechanisms for existing regulations;

- Lack of community based programmes for the restoration of ecosystems; and,
- Insufficient species recovery programmes nationwide

Control of Alien Species

Issues and Gaps:

- Lack of adequate scientific knowledge of invasive species in the various ecologies of sierra Leone ;
- Lack of identification and monitoring mechanisms for alien species;
- Lack of control and mitigation mechanisms for combating the harmful effects of alien species;
- Lack of public awareness of the harmful effects of invasive species on biodiversity;
- Lack of up –to –date policies and legal provisions for the control of importation of exotic species in sierra Leone, and;
- Continuous utilization of alien or exotic species in afforestation programmes in sierra Leone;

Ex-situ Conservation

Issues and Gaps:

- Ex-situ conservation activities are almost exclusively undertaken by educational and research institutions;
- Weak institutional framework for the establishment of ex –situ conservation facilities such as gardens, aquaria and herbal gardens;
- Lack of comprehensive sectoral policies and laws on ex –situ conservations.

Sustainable Use of Biodiversity Components.

Issues and Gaps

- Lack of policy and legislative guidelines in some sectors on sustainable exploitation methodologies for biological resources;
- Increased population pressures have contributed significantly towards overexploitation of biological resources such as those of forest, agriculture, wildlife and fisheries;
- Use of inappropriate technologies in harvesting of biological resources;
- There are significant post harvest loses for products from sectors such as forestry, wildlife, agriculture and fisheries, and;
- Inadequate enforcement mechanisms for existing sectoral policies and regulations relating to sustainable exploitation of biological resources.

Incentive Measures

Issues and Gaps:

- There is no explicit policy or legislative framework on incentive measures for the conversation and sustainable use of biological diversity in sierra Leone;

- Certain sectoral policies and legislations lack emphasis on incentives for ecosystem restoration and biodiversity conservation, and;
- Present incentive in sectoral policies are for programmes which promote overexploitation of resources in the drive to meet target performance levels;

Research and Training

Issues and Gaps

- Research into biodiversity related areas has only been carried out by institutions of higher learning and research institutions;
- Most of research emphasis were largely for the purposes of exploitation rather than for the conservation and sustainable use of biodiversity;
- Most of the findings of past and on-going biodiversity related matters have remained either largely unpublished or inaccessible; and,
- Almost all agencies responsible for the management of biological resources lack the necessary capacity to undertake research.

Public Education and Awareness

Issues and Gaps

- Major indirect threats to the conservation and sustainable use of biodiversity in sierra Leone are illiteracy, ignorance, poverty and lack of awareness;
- Lack of awareness of biodiversity conservation and sustainable use among the general public is widespread and not just confined to the rural and illiterate majority;
- Media coverage and awareness raising campaigns on environmental matters are only now extending to rural communities, mainly through the effort of the EPASL;
- Environmental programmes for inclusion into basic education curricula are fairly recent and do not explicitly stress biodiversity, and;
- Various sectoral legislations make no specific provisions for environmental education.

Impact Assessment and Minimising Adverse Impacts

Issues and Gaps:

- There is a proliferation of large scale and artisanal mining activities in the country. Although the EPASL is making significant strides to ensure that such activities obtain an EIA license prior to operation, the challenge is immense;
- Large scale projects continue to emerge in various fields, including mining (iron ore, kimberlite, bauxite, titanium, gold, silica), commercial agriculture, hydroelectricity, waste disposal, logging and industrial fishing;

Sharing of Benefits Arising From the Use of Genetic Resources

Issues and Gaps

- Lack of comprehensive legislation about access to the genetic resources and the sharing of the benefits arising from the use of biological resources;

- Few sectoral legal provisions regulating access to genetic resources exists in the country ;
- Sectoral legal provisions regulating access to genetic resources are outdated, and;
- Lack of explicit provisions in SLEPA Act (2008) and the EPASL supplementary Act (2010) to regulate access to genetic resources and the sharing the benefits.

Indigenous Knowledge and Intellectual Property Rights

Issues and Gaps

- Lack of adequate information on indigenous knowledge and practices in the conservation and sustainable use of biodiversity;
- Outdated and inadequate legislation on intellectual property rights;
- Sources of indigenous knowledge often not acknowledged or rewarded;
- High rate of attrition and loss of indigenous knowledge as the older people die off;
- Lack of general awareness among local communities on the intellectual property rights and rewards;

Access to Technology and Handing of Biotechnology

Issues and Gaps

- Lack of knowledge of the legal requirements for the transfer of technology;
- Lack of statutory framework for the regulation of biotechnology ;
- Outdated and sectoral patent laws in Sierra Leone, and;
- Existing institutions have not included biotechnology risks assessment into their programmes.

Information Exchange and Technical/Scientific Cooperation

Issues and Gaps

- Inadequate provisions in sectoral laws on the exchange of technical and scientific information on biodiversity conservation and its sustainable use as stipulated by Articles 17 and 18 of the CBD;
- No specific centralized institution with a mandate and capacity to gather and deciminate information at national and international levels. This responsibility is spread amongst a number of institutions, and;

Relationship Between CBD and Other Conventions

Issues and Gaps:

- The focal points for the implementation of various treaties and conventions to which sierra Leone is a party are scattered amongst various (line) ministries and agencies;
- Very little co-ordination and often weak linkages exist between implementing bodies of the national obligation under the different conventions, and;
- Therefore, there are overlaps, duplications and conflicts in the implementation of programs amongst these various institutions.

Financial Resources

***Issues and Gaps**:*

- In addition to weak infrastructure and staff shortages, the GOSL is plagued with chronic shortage of financial resources;
- Budgetary allocation in post war sierra Leone is mostly directed towards reconstruction and rehabilitation work rather than toward conservation of biodiversity;
- There are new World Bank guidelines for conservation of biological diversity in project as requiring World Bank funding;
- Sectoral budgetary allocation by the GOSL for the biodiversity conservation activities is grossly inadequate;
- Most NGOs involved in biodiversity work face financial constraints as the most serious impediment

APPENDIX VI

Threatened and Near Threatened flora in Sierra Leone

Garcinia kola	**Guttiferae**	**Vu**	**Tree**	**Dicot**

Species	Family	Status	Habit	Type
Afzelia africana	Leguminosae	Vu	Tree	Dicot
Albizia ferruginea	Leguminosae	Vu	Tree	Dicot
Amanoa bracteosa	Euphorbiaceae	Vu	Tree	Dicot
Amanoa strobilacea	Euphorbiaceae	Vu	Tree	Dicot
Anopyxis klaineana	Rhizophoraceae	Vu	Tree	Dicot
Ansellia africana	Orchidaceae	Vu	Herb	Monocot
Anthonotha vignei	Leguminosae	Vu	Tree	Dicot
Antrocaryon micraster	Anacardiaceae	Vu	Tree	Dicot
Bafodeya benna	Chrysobalanaceae	Vu	Tree	Dicot
Berlinia occidentais	Leguminosae	Vu	Tree	Dicot
Cola attiensis	Sterculiaceae	EN	Tree	Dicot
Cola reticulata	Sterculiaceae	Vu	Tree	Dicot
Cola umbratilis	Sterculiaceae	Vu	Tree	Dicot
Copaifera salikounda	Leguminosae	Vu	Tree	Dicot
Cordia platythyrsa	Boraginaceae	Vu	Tree	Dicot
Cryptosepalum tetraphyllum	Leguminosae	Vu	Tree	Dicot
Deinbollia maxima	Sapindaceae	Vu	Tree	Dicot
Didelotia idae	Leguminosae	NT	Tree	Dicot
Dissotis pobeguinii	Melastomataceae	Vu	Herb	Dicot
Drypetes afzelii	Euphorbiaceae	Vu	Tree	Dicot
Drypetes pellegrinii	Euphorbiaceae	Vu	Tree	Dicot
Entandrophragma angolense	Meliaceae	Vu	Tree	Dicot
Entandrophragma candollei	Meliaceae	Vu	Tree	Dicot
Entandrophragma cylindricum	Meliaceae	Vu	Tree	Dicot
Entandrophragma utile	Meliaceae	Vu	Tree	Dicot
Garcinia afzelii	**Guttiferae**	**Vu**	**Tree**	**Dicot**
Gilbertiodendron bilineatum	Leguminosae	Vu	Tree	Dicot
Gilbertiodendron limba	Leguminosae	NT	Tree	Dicot
Gilbertiodendron splendidum	Leguminosae	Vu	Tree	Dicot
Guarea cedrata	Meliaceae	Vu	Tree	Dicot
Guarea thompsonii	Meliaceae	Vu	Tree	Dicot
Hallea stipulosa	Rubiaceae	Vu	Tree	Dicot
Haplormosia monophylla	Leguminosae	Vu	Tree	Dicot
Heritiera utilis	Sterculiaceae	Vu	Tree	Dicot
Homalium smythei	Salicaceae	Vu	Tree	Dicot
Irvingia gabonensis	Irvingiaceae	NT	Tree	Dicot
Isoglossa dispersa	Acanthaceae	Vu	Herb	Dicot
Isolona deightonii	Annonaceae	Vu	Tree	Dicot
Ixora nigerica	Rubiaceae	Vu	Shrub	Dicot
Khaya anthotheca	Meliaceae	Vu	Tree	Dicot
Khaya grandifoliola	Meliaceae	Vu	Tree	Dicot
Khaya senegalensis	Meliaceae	Vu	Tree	Dicot
Ledermanniella aloides	Podostemaceae	Vu	Herb	Dicot
Lophira alata	Ochnaceae	Vu	Tree	Dicot

Lovoa trichilioides	Meliaceae	Vu	Tree	Dicot
Maclaudia felixii	Asclepiadaceae	NT	Liana	Dicot
Marsdenia magniflora	Asclepiadaceae	Vu	Liane	Dicot
Milicia excelsa	Moraceae	NT	Tree	Dicot
Milicia regia	Moraceae	Vu	Tree	Dicot
Millettia warneckei	Leguminosae	Vu	Liane	Dicot
Monocyclanthus vignei	Annonaceae	EN	Shrub	Dicot
Monopetalanthus compactus	Leguminosae	Vu	Tree	Dicot
Nauclea diderrichii	Rubiaceae	Vu	Tree	Dicot
Neolemonniera clitandrifolia	Sapotaceae	EN	Tree	Dicot
Neostenanthera hamata	Annonaceae	Vu	Tree	Dicot
Nesogordonia papaverifera	Sterculiaceae	Vu	Tree	Dicot
Pararistolochia goldieana	Aristolochiaceae	Vu	Herb	Dicot
Pavetta lasioclada	Rubiaceae	Vu	Shrub	Dicot
Pellegriniodendron diphyllum	Leguminosae	NT	Tree	Dicot
Phyllanthus profusus	Euphorbiaceae	Vu	Shrub	Dicot
Piptostigma fugax	Annonaceae	Vu	Tree	Dicot
Placodiscus attenuatus	Sapindaceae	EN	Tree	Dicot
Placodiscus oblongifolius	Sapindaceae	Vu	Tree	Dicot
Placodiscus pseudostipularis	Sapindaceae	EN	Tree	Dicot
Pseudovigna sulaensis	Leguminosae	Vu	Herb	Dicot
Pterygota macrocarpa	Sterculiaceae	Vu	Tree	Dicot
Raphionacme caerulea	Asclepiadaceae	EN	Herb	Dicot
Rhodognaphalon brevicuspe	Bombacaceae	Vu	Tree	Dicot
Rhytachne glabra	Gramineae	Vu	Herb	Monocot
Rhytachne megastachya	Gramineae	NT	Herb	Monocot
Sapium aubrevillei	Euphorbiaceae	Vu	Tree	Dicot
Schumanniophyton problematicum	Rubiaceae	Vu	Tree	Dicot
Scleria robinsoniana	Cyperaceae	NT	Herb	Monocot
Sterculia oblonga	Sterculiaceae	Vu	Tree	Dicot
Stylochaeton pilosus	Araceae	EN	Herb	Monocot
Synsepalum tsounkpe	Sapotaceae	EN	Tree	Dicot
Synsepalum aubrevillei	Sapotaceae	Vu	Tree	Dicot
Terminalia ivorensis	Combretaceae	Vu	Tree	Dicot
Tieghemella africana	Sapotaceae	EN	Tree	Dicot
Tieghemella heckelii	Sapotaceae	EN	Tree	Dicot
Trichilia ornithothera	Meliaceae	Vu	Tree	Dicot
Trichoscypha cavalliensis	Anacardiaceae	Vu	Tree	Dicot
Triclisia macrophylla	Menispermaceae	CR	Shrub	Dicot
Turraeanthus africana	Meliaceae	Vu	Tree	Dicot
Vepris suaveolens	Rutaceae	NT	Tree	Dicot
Warneckea memecyloides	Melastomataceae	Vu	Tree	Dicot
Xylopia elliotii	Annonaceae	Vu	Tree	Dicot
Xysmalobium samoritourei	Asclepiadaceae	EN	Herb	Dicot
Zanthoxylum atchoun	Rutaceae	Vu	Tree	Dicot