National Biodiversity Report

TABLE OF CONTENTS

LIST OF ABBREVIATION AND ACRONYMS

ADB - African Development Bank

AFRC - Armed Forces Revolutionary Council

BSAP - Biodiversity Strategy Action Plan

CBD - Convention on Biological Diversity

CCD - Convention to Combat Desertification

CHESIL - Council for Human Ecology of Sierra Leone

CILSS - Convention Establishing a Permanent Inter-State Committee for the Control of Draught in the Sahel

CITES - Convention on International Trade in Endangered Species of Wild Fauna and Flora

CMU - Coordination and Monitoring Unit

COP - Conference of Parties

EEC - Exclusive Economic Zone

EFA - Environmental Foundation for Africa

EIA - Environmental Impact Assessment

EPS - Environmental Protection Section

EU - European Union

FAO - Food and Agricultural Organisation

GDP - Gross Domestic Product

GEF - Global Environmental Facility

GOSL - Government of Sierra Leone

GTZ - German Technical Assistance

IAR - Institute of Agricultural Research

IDP - Internally Displaced Persons

IEZ - Inshore Exclusion Zone

IMO - International Maritime Organisation

ITTA - International Institute of Tropical Agriculture

IVS - Inland Valley Swamp

MARPOL - Convention for the Prevention of Pollution from Ships

MFMR - Ministry of Fisheries and Marine Resources

MOAFF - Ministry of Agriculture Fisheries and Food Security

MODEP - Ministry of Development and Economic Planning

MOF - Ministry of Finance

MOHS - Ministry of Health and Sanitation

MOIB - Ministry of Information and Broadcasting

MOLARD - Ministry of Local Administration and Rural Development

MOLCPE - Ministry of Lands Country Planning and Environment

MOMR - Ministry of Mineral Resources

MSY - Maximum Sustainable Yield

MOTC - Ministry of Tourism and Culture

MOTTC - Ministry of Transport and Communication

NARCC - National Agricultural Research Coordinating Council

NBSAP - National Biodiversity Strategy Action Plan

NEP - National Environmental Protection Policy

NEPA - National Environmental Protection Act

NGO - Non Governmental Organisation

NUC - Njala University College

PA - Protected Area

RAMSAR - Convention on Wetlands of International Importance

RRS - Rice Research Station

SAFGRAD - Semi-Arid Food Grain Research and Development

SLANGO - Sierra Leone Association of Non Governmental Organizations

SLMA - Sierra Leone Maritime Administration

TOR - Terms of Reference

UNDP - United Nations Development Programme

UNFCCC - United Nations Framework Convention

WARDA - West African Rice Development Association

WARRI - West African Rice Research Institute

EXECUTIVE SUMMARY

Biodiversity can be defined as “the sum of all biological variation over all scales, from the genetic varieties, through the different species to the variety in ecosystems and landscapes”. (Jelmert, 2003).

Biological diversity and its components are of tremendous ecological, genetic, social, economic, scientific, educational, cultural recreational and aesthetic value to mankind. Biological diversity also fuels and sustains life on our planet. The resources of nature are under siege from anthropogenic activities exacerbated by rapid global population growth.

Ecosystem depletion and with it biodiversity loss has proceeded at an alarming rate during the last 100 years leading the extinction of some species. In recognition of the need for the conservation of the Biological Diversity and the equitable sharing of the benefits of genetic resources the UN elaborated the Convention on Biological Diversity (CBD) in 1992 as a matter of extreme urgency.

Sierra Leone as part of the global community participated in the Rio de Janeiro Conference in 1992 signed and ratified the CBD in 1994 and 1996 respectively. The Government of Sierra Leone(GOSL) in compliance with the provisions of the article 6 and 8 of the CBD carried out a country study and also elaborated the National Biodiversity Strategy and Action Plan (NBSAP) in 2002.

The NBSAP among its recommendations for implementation has called for wide ranging legal and institutional reforms at all levels.

The country reports revealed that the need for conservation and sustainable use of natural resources has been recognized in Sierra Leone since the colonial periods and enacted sector focused pieces of legislation particularly in the following areas; Forestry (1942, 1946, 1955) Agro-biodiversity (1946) and Marine biodiversity (1932). A comprehensive Wildlife Conservation Act was passed in 1972. The most important sectoral pieces of legislation over the past years incorporating elements of biodiversity include Forestry rules (1955), Forest Industry

Corporation Act (1992), Fisheries Management and Development Act (1988; 1994), Mines and Minerals Act (1994), Sierra Leone Maritime Administration Act (2000), Natural Environmental Protection Act (2000) and Merchant Shipping Act (2002).

In 1985 in order to harmonize the various sectoral laws, the Environmental Protection Section (EPS) was set up in the Ministry of Lands, Housing and the Environment to serve as a supervisory and co-ordinating body to the various inter-ministerial and inter-sectoral cross-links. The EPS prepared the National Environmental Policy (NEP) document in 1994 followed by the National Environmental Protection Act (NEPA) in 2000.

Sierra Leone is signatory to or has ratified the following important international conventions and instruments including, Convention on Biodiversity (CBD), United Nations Framework Convention on Climate Change (UNFCCC), United Nations Convention to Combact Desertification (CCD), Convention on International Trade in Endangered species of Wild Fauna and Flora (CITES), Convention on Wetlands of International/Importance (Ramsar), Convention on Biosafety, United Nations Convention on the Law of the Sea (UNCLOS), Bassel Convention and Vienna Convention and Montreal Protocol.

Sierra Leone with an area of 72,32Km^2 could be described as a small country. Being part of westernmost part of the upper Guinean lowland forest is rich in terms of the biological diversity. The climate is typically tropical with two(2) seasons; wet (May – October) and dry)November – April) each lasting about 6 months.

The six (5) major ecosystems can be classified as Forest, Montane, Savanna, Agricultural, Freshwater and Wetlands and Coastal and Marine. The vegetation consists of largely Forest and Savanna.

The Forests of Sierra Leone consists of mostly evergreen and semideciduous types and represent barely 5% of land area today compared with 75% some 100 years ago. The forest covers

lowland areas and Montane ecosystems. There are an estimated 2000 plant species within the Forests including 74 endemic species.

The savanna covers about 35% of the entire country. There are 48 forest reserves and conservation areas within the forest of which 11 are protected, including Gola North, Cold East, Western Area, Lake Soufon, Loma Mountains, Yawri Bay and Tingi Hills (Allan, 1990; Lebbie 2002).

About 173, 095 ha of land are under wildlife management. Wildlife Protected Areas include; Outamba Kilimi National Park (98,420ha), Tiwai Islands Game Sanctuary (12,00ha), Mamunta Mayoso Game Sanctuary (2,000ha), Western Area Forest (17,688), Loma Mountains (32,816ha) and Sankan Briwa (11,997ha).

The coastline is about 560Km long and the shelf covers an area (to 200m depth) of 30,000Km$^{2.}$ The major rivers draining the land include Great Scarcies, Little Scarcies, Rokel, Jong, Sewa, Moa and Mano. The biodiversity components, include Wildlife (fauna and flora) as well domesticated species and races of plants and animals. The diversity of species themselves depends on the type of ecosystems encountered.

Fifteen species of primates, 10 of antelopes and duikers, large mammals including elephants and leopards, 9 species of bats and some 500 species of birds. Endangered species include the Pygmy hippopotamus (*Hexapratodon*) bongo (*Boocercus eryceros*) and the duikers (*Cephalophus doriae* and *C. jentinki*). The major savanna vegetation include Forest Savanna, Mixed tree savanna and grassland savanna. As many as 1,500 species of plants have been identified so far. The wildlife include large mammals (elephants, leopards, hyenas, duikers, genet, civets, warthogs, aardvarks, chimpanzees, baboons, monkeys) birds, reptiles, amphibians, snails and arthropods.

Among the mammals 6 are recorded as endangered, 5 vulnerable and 6 threatened. Agricultural biodiversity consists of some 70 crop species. The important periennial crop are oil palm (*Elaeis guineensis*) Cacao (*Theobroma cacoa*), and Coffee (*Coffea robusta*). Rice *(Oryza sativa*) alone accounts for morethan 85% of the 31% GDP contributed by the agricultural sector.

Rice is cultivated in uplands inland valley swamps (IVS) mangrove, riverine grasslands and bolilands. Other important annual crops include sorghum (*sorghum margaritiferun*) Maize (*Zea nays*), cassava (*Manihot esculenta*) and sweet potato (*Ipomea batata*).

Livestock consisting mostly of cattle, sheep, goats, pigs, rabbits and birds (chickens, ducks, guinea,fowls pigeons) were nearly decimated by the civil conflict.

There are an estimated 4,837.8Km^2 of wetlands and between 200,000 – 300,000 ha of mangrove swamps (Bah, 1994, Fombah, 1994). Wetland animal life consists of about 240 species of birds, crocodiles, lizards, carnivores and herbivores and other invertebrates.

There are extensive rivers, streams and lakes. There are over 100 species of fish with an estimated biomasss of 50,000mt and 16,000mt of potential yield. The coastal and marine biodiversity is rather impressive and species including plankton seaweeds, There are several Coelenteratas, polychaetes, Protochordata, gastropods, bivalves and Crustacea.

There are over 200 species of fish which forms a cheap source of protein for over 70% of the population. The total estimated biomass is between 500,000mt and 700,00mt with a Maximum Sustainable Yield (MSY) of 200,000mt. Among the threatened and overexploited species are catfishes, snappers and sciaenids.

A large part of the rural population depend on biodiversity products for use as foodstuff, fuel (fuelwood and charcoal), construction materials, thatching and roofing materials, ropes, crafts, medicinal plants, fodder, recreational materials, (raffia, ornaments) spices, perfumes, poisons, composts, herbicides and insecticides. With the intensification of the war, the local population increased the wildlife cropping, targeting animals including mammals, birds, reptiles, frogs and insect. The bush meat trade is widespread even today. Wildlife parks and reserve were also heavily exploited.

The activities constituting major threats to biodiversity include Agriculture, Livestock farming, Forest exploitation, Fishing, Energy exploitation, Mining, Transportation, Urbanization (infraststructure development) and Waste disposal. These threats have been exacerbated by the 10 year civil conflict (Coker and Kamara, 2002). The forest cover had been reduced from about 70% in 1990 to merely 5% in 1990 (Grubb et al (1998). Today forest regrowth constitutes 60% of the total area.

The overall biodiversity vision for the Republic of Sierra Leone "aspires for sustained exploitation and utilization of natural resources, maintenance of environmental quality and its aesthetics". The overall goals and strategic objectives of the NBSAP seek conservation measures that provide the solid framework for the sustainable exploitation of Sierra Leone's biodiversity for the benefit of present and future generations.

In fulfillment of one of the key obligations for contracting parties under Article 6 of the CBD, Sierra Leone has prepared the Sierra Leone National Biodiversity Strategy and Action Plan (NBSAP).

The strategies are divided into two broad categories : the thematic (sectoral) strategies and general measures (cross-sectoral strategies). The main thematic areas covered are Wildlife, Forest, Biological diversity, Agricultural biological diversity, Inland water biological diversity and marine and coastal biological diversity. The cross-sectoral strategies cover cross-cutting issues including policy legislation, capacity building, public participation, planning, monitoring, protected areas, conservation, sustainable use, incentive measures, research and training, public education, impact assessment, access to technology, information exchange, sharing of benefits, indigenous knowledge and financial resources.

The Action Plan proposed in the Sierra Leone Biodiversity Strategy and Action Plan comprises a series of measures and mechanisms intended to conserve and promote the sustainable use of different components of the country's biodiversity and covers both the main thematic areas and cross-cutting issues.

The actions proposed in this plan to ensure the maintenance of biodiversity is estimated to be between 5-10 years if the measures proposed are undertaken.

Some of the actions proposed will either serve to protect restore or lead to the sustainable utilization of biodiversity.

Other actions will focus on assessments and research, the provision of policy and institutional framework. The Action Plan of NBSAP is estimated as US$ 95,400,000.

The NBSAP will be implemented through a series of specific projects and programmes by relevant agencies including Government Departments, NGOs, Private Sector and Local Communities. For the co-ordination and facilitation of the NSAP there shall be a Biodiversity co-ordination Unit (BCU). The BCU secretariat shall be supported by a technical team and supervised by an intersectoral steering committee. 19 Priority project profiles are presented in Annex 1 for a total cost of US$ 47,745,000.

The action plan has been prepared after extensive consultation with various stakeholders at workshops and review reports.

I. INTRODUCTION

Sierra Leone is situated along the Atlantic Ocean in West Africa. It lies between latitudes $6^{o}55'$ N and 10^{o} N and between longitude 10^{o} 14'W and 13^{o} 17' W. The total land area is 72,325 Km^{2}.

The population size is estimated to be 4.5 million with a growth rate of 2.4% per annum. The country is found at the western tip of the upper Guinea lowland forests and is typically tropical. There are essentially two seasons; wet (May – October) and dry (November – April) seasons, each lasting approximately 6 months. The annual rainfall varies from about 1,800mm in the Northeast of the country to about 5000mm in the Freetown Peninsula. The average monthly temperatures are around $26^{o}C$. The heavy rains and maritime influence lead to humidity values of up to 92% in the wet season and 45% inland in the dry season. The country is divided into four(4) main relief regions; coastline, interior lowland plains, interior plateau and mountains.

The coastline is about 560 Km long and the shelf covers an area (to 200m depth) of 30,000$Km^{2.}$ The drainage system consists of a series of rivers from North to South including the following: Great Scarcies, Little Scarcies, Rokel, Jong, Sewa, Moa and Mano.

The interior lowland plains extending from the coastal terraces in the west to the east of Sierra Leone occupies approximately 43% of the land area. The interior plateau is made up to granite that run from the northeast of the country to southeast. They seldom rise above 700m and are comprised of alluvial iron stone gravel in the south eastern region while the north end is comprised of weathered outcrops of granite rocks.

The highest mountains are found in the North and East of the country; Loma Mountains and Tingi Hills respectively. The highest peak in the Loma mountains is the Bintumani and rises to 1945m. The Sankan Biriwah on the Tingi Hills rises to 1805m.

The Freetown Peninsula is made up of dissected mountainous Peaks with Sugar Loaf and Picket Hills being the highest.

Sierra Leone has the following 6 major ecosystems:

- Forest
- Montane
- Savanna
- Agricultural
- Wetland and Freshwater
- Coastal and Marine

Sierra Leone's rich biological diversity is reflective of the categories of existing ecosystems.

The flora and fauna are impressive and consists of wild-life and domesticated species. The species richness and diversity had been recognized since colonial times. There are approximately 48 forest reserves and conservation areas in Sierra Leone. Major threats to biodiversity have also been recognized as being due largely to anthropogenic activities exacerbated by rapid population growth inappropriate land use patterns, lack of appropriate infrastructure, lack of harmonized legislative framework and above all long periods of political instability.

The 10 years of civil conflict was characterized by high security risks, breakdown of law and order in large parts of the country and massive displacement of population.

It has been estimated that by 1995 some 43% of the entire population may have lived within 10Km of the coast.

The population of Greater Freetown for example increased from 500,000 in 1985 to 1.5 million in 2000. The various pieces of legislations in different Government agencies were difficult to enforce let alone coordinate. The effect of the conflict has certainly been drastic and has led to rapid loss of biodiversity.

Sierra Leone had participated fully in the deliberations which led to the formulation of the Convention of Biodiversity (COD) in Rio de Janeiro in 1992.

Successive Governments science colonial times having recognized the need for clean environment, conservation and sustainable use of biological resources have formulated policies and legislations to reflect this concern. These policies and legislations were enacted to address the needs of various ministries, departments and sections such as Transport, Mining, Health, Agriculture, Forestry, Fishing, Tourism and Water resources. In order to harmonize the various sectoral laws, the Environmental Protection Section (EPS) was set up in the Ministry of Lands, Housing and the Environment to serve as a supervisory and co-ordinating body to the various inter-ministerial and inter-sectoral cross-links.

The EPS prepared the National Environmental Policy (NEP) document in 1994 followed by the National Environmental Protection Act (NEPA) in 2000. An Environmental Protection Board was also set up.

Sierra Leone became a signatory to the Convention on Biological Diversity (CBD) in 1994.

The Government of Sierra Leone (GOSL) having ratified the CBD in 1996 needs to comply with various provisions of the said convention including Article 6 on the "General measures for the Conservation and Sustainable Use of Biodiversity". The GOSL in compliance with the provisions of article 6 and 8 has carried out a country study in 2002 and also in 2002 the National Biodiversity Strategy and Action Plan (NBSAP) was elaborated. NBSAP among its recommendations for implementation has called for wide ranging legal and institutional reforms at all levels.
This report describes the measures taken by the GOSL for the implementation of article 6 to the CBD.

This article which deals with the "General Measures for Conservation and Sustainable use" is as follows:
Each contracting party shall, in accordance with its particular conditions and capabilities:

(a) 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; and

(b) Integrate as far as possible and as appropriate, the conservation and sustainable use of Biological diversity into relevant sectoral or cross-sectoral plans, programmes and Policies.

In the preparation of this report, due cognizance has been taken of the provisions of article 26 of the CBD on the guidelines for the presentation of National Reports.

II. BACKGROUND TO THE SIERRA LEONE BIODIVERSITY COUNTRY STUDY

A. INTRODUCTION

In 1996, the Ministry of Agriculture, Forestry and Marine Resources requested on behalf of the Government of Sierra Leone (GOSL) assistance from the Global Environmental Facility (GEF) through the United Nations Development Programme (UNDP) to formulate the Biodiversity Strategy Action Plan (BSAP) and then accordingly draft the Country Report to the Conference of Parties (COP). Because of the political instability between 1997 and 1998 (Armed Forces Revolutionary Council, AFRC Coup d'etat) another renewed request by GOSL to the GEF was made in 2000. This request was approved in June 2001 and funds provided to expedite the process.

With the Ministry of Agriculture, Forestry and Food Security (MOAFF) serving as the focal point, a Project Manager was appointed in 2001.

In 2001 a Steering Committee was appointed by the GOSL to supervise the BSAP process, provide overall policy and technical direction and guidance.

Members of the Steering Committee were drawn from a wide range of stakeholders including representations from the public sector (Government and Public Institutions), the private sector (NGOs and local committee), Civil Society Movements and Donor Community. The Planning Team as constituted included representatives from the following organizations, UNDP, Sierra Leone Maritime Administration (SLMA), Sierra Leone Association of Non Governmental Organizations (SLANGO), Civil Society, Ministry of Fisheries and Marine Resources(MFMR), Ministry of Lands Country Planning and the Environment (MOLCPE), Ministry of Agriculture Forestry and Food Security (MOAFF), Ministry of Tourism and Culture (MOTC), Ministry of Mineral Resources (MOMR), Ministry of Information and Broadcasting (MOIB), Ministry of Local Administration and Rural Development(MOLARD), Ministry of Development and

Economic Planning (MODEP), Ministry of Finance (MOF), and Ministry of Health and Sanitation (MOHS).

In 2002, a team of National Consultants was contracted to undertake some studies on specific issues including:

- Biodiversity Assessment and Identification of Priorities for Biodiversity Conservations;

- Analysis of Threats/Pressures on Biodiversity and Sustainability of the Use of Biological
  Resources;

- Analysis of the Equitability of the Share of Benefits from the Use of Genetic Biological Resources;

- Assessment of Agro-biodiversity, Genetic Resources and Causes of its loss;

- Analysis of the Adequacy of the Institutional framework on Human Resource Base for Biodiversity Conservation, Sustainable, Use and Equitable Sharing of Benefits.

- Review of Existing Programmes and Projects for Biodiversity Conservation

- Assessment of the Impact of Refugees and Internally Displaced Communities as a result of the 10-year rebel war on Biodiversity of Sierra Leone;

- Analysis of the Adequacy of the Legal and Policy Framework for the Conservation of Biodiversity;

- Assessment of the Institutional Capacity needs for Biotechnology, Risk Assessment and Management.

- Assessment of the Role of Tourism in the Sustainable Use of Biological Resource and its Impact on Biodiversity;

- Assessment of the Status of Coastal and Marine Biodiversity in Sierra Leone;

From their Terms of Reference (TOR), the National Experts were expected to undertake a range of activities including extensive Literature review, field visits, studies where appropriate, the administration of questionnaires and conducting interviews with relevant stakeholders.
The studies were carried out with financial support provided by GEF through UNDP.

The studies were intended to achieve the following objectives :

(i) to identify the available sources of information on the country's biodiversity and gaps in knowledge;
(ii) to provide information on the major ecologies and species diversity;
(iii) to identify threats, impacts and trends in the biodiversity;
(iv) to assess the socio-economic value of the country's biodiversity including sharing of benefits;
(v) to provide a basis for determining national priorities for the conservation and sustainable use of biological diversity; and
(vi) to recommend appropriate measures for effective conservation and sustainable use including policy, legislation, infrastructure manpower needs and financial support.

The first National Stakeholders workshop on BSAP was held in Freetown from 10th to 13th September, 2002.

The Workshop reviewed and discussed the draft National Consultants Reports, made recommendations on the way forward and adopted the Biodiversity Vision for Sierra Leone.

6 Provincial Workshops or Regional workshops were also held between November and December, 2002. These latter workshops were largely participatory and concentrated on major topics including Agriculture, Forestry, Wildlife, Benefit Sharing and Fisheries.

The findings of the workshops are presented below and shall be considered under Terrestrial and Aquatic Biodiversity.

Three consultants were contracted to review the stocktaking documents, the reports of the provincial workshops and the findings of the first National Stakeholders workshop held in Freetown from 10th to 13th September, 2002.

These Consultants produced the following draft reports:

- Status and Trends in Biodiversity in Sierra Leone
- Proposed Strategies and Accounts for Biodiversity
- National Report for the Biodiversity Strategy and Action Plan

The three draft reports were reviewed by an International Consultant and National Consultants. A second National Workshop for the Biodiversity Strategy and Action Plan was held in Freetown from 18 – 21 August 2003 at which the three reports were extensively discussed, validated and endorsed. Based on the finding of the National Workshop and comments from various sources, the final reports were to be compiled.

The document is the final National Report on the NBSAP for Sierra Leone.

B. STATUS AND TRENDS OF COMPONENTS OF BIODIVERSITY

1. TERRESTRIAL BIODIVERSITY

1.1 Forest Biodiversity

Seventy percent (70%) of Sierra Leone in early 20% Century was once covered with forest but has been reduced to barely 5% today (Unwin 1922; Savill and Fox: 1969; Gordon et al 1980).

There are two types of forests in Sierra Leone: Tropical moist evergreen forest and moist semideciduous forest. The former can be further divided into lowland rainforest ecosystem and montane.

Lowland Rainforest Ecosystem.

Lowland rainforest although found in the rest of the country is more skewed to the East and South. The dominant tree species include *Heritiera utilis, Cryptosepalum tetraphyllum, Lophira alata* and *Erythrophleum ivorense*.

Moist semideciduous forest is found mostly in the north of the country and the dominant plant species include *Terminalia ivorensis, Terminalia superba, Daniella thurifera, Parkia bicolor* and *Parirari excelsa.* Where secondary forests are found the plant species are dominated by *Funtumia africana, Musanga cecropiodes, Threma guineensis, Carapa procera, Elaeis guineensis* and *Spondias mombin*.

There are 11 protected areas within the forests (moist forest and semideciduous) including: Gola North, Gola East, Western Area, Lake Sonfon, Loma Mountains, Yawri Bay and Tingi Hills. (Allan, 1990; Harcourt et al. 1992; Bomah, 2002; Lebbie, 2002)

Generally there are over 2000 species of plants including 74 endemic species.

Forest Wildlife Biodiversity

Although the country is not numerically rich in wild animal species, its position as the westernmost extent of the Upper Guinea forest block affords it the advantage of some endemism and a number of rare mammals.

Fifteen (15) species of primates occur in Sierra Leone including the Monkeys: *Colobus polykomos, Piliocolobus badius badius, Cercopithecus diana diana* and *Precolobus versus*. The chimpazee (*Pan troglodytes versus*) is found throughout Sierra Leone.

Eighteen (18) species of antelopes and duikers occur in Sierra Leone including *Tragelaphus spekei, Cephalophus zebra* and *Cephalophus jentinki.* Large mammals include the elephant (*Loxodonta africana cyclotis) Pygmy hippopotamus (Hexapratodon liberiensis* and leopard (*Anthera pardus*) (Grubb et al. 1998).

Nine (9) bat species have been recorded (Stuart and Adams, 1990). Herpetofauna have been poorly documented. Over 500 species of birds species have been recorded. Invertebrates have been poorly documented.

Endangered species include the *Pygmy hippopotamus* (*Hexapratodon liberiensis*), bongo *(Boocercus eryceros)*, the banded duiker (*Cephalophus doriae*) and *jentinks duiker (Cephalophus jentinki)*. The GOSL has become more aware of the importance of the country's wildlife resources especially in the promotion of Ecotourism industry and the need to protect wildlife in general.

About 432,737 acres (173, 095ha) of land are under wildlife management and protection. The following areas have been demarcated as Wildlife Protected Areas:

(i) Outamba Kilimi National Park.

This was declared in 1995 as the country's first National Park. It covers an area of 98,420 ha. The area consist mainly of Savanna and closed forests. The threatened species include; Elephants, Chimpazees and the Bongo

(ii) Tiwai Islands.

This is mainly a Game sanctuary of 12,000 ha in a closed high forest zone. Rare animals include Pygmy hippos and banded duikers.

(iii) Mamunta Mayoso

This is a proposed Game Santuary (2,000 ha) of wetland swamp vegetation. There is a rich variety of birdlife in the sanctuary.

(iv) Western Area Forest.

This is a protected forest and a non-hunting reserve. It consists of mainly 17688 ha of closed forest. Among the rare animals found are J*entinks duikers* and chimpanzees.

(v) Loma Mountains

This is a 32,816 ha non-hunting forest reserve of montane vegetation consisting of rainforest and grassland. Among the rare animals found are leopards.

(vi) Sankan Briwa

This montane forest reserve covers an area of 11,997 ha and consists of forest vegetation and grasslands.

1.2. Montane Ecosystems Biodiversity

The two mountain chains (Loma mountains and Tingi Hills) found in the North and East occupy some 451 km^2. The highest peaks are Bintumani (1947m) and Sanka Biriwa (1860m) in the Loma and Tingi Hills respectively. The annual rainfall varies between

1600 and 2400mm. The soil is largely infertile. The mountain range is also the source of some major rivers.

Plant associations encountered are dependent on the height above sea level. 4 identifiable plant associations are closed forest and Guinean Savanna (460 – 915m), and sub-montane gallery forest and sub-montane savanna (915 – 1700m).

About 1,576 plant species in 757 genera and 135 families have been identified. There are 4 endemic plant families including *Triphyophyllum peltatum, Octoknena borealis* and *Napoleona leonesis*.

Other endemic species include *Afrotrilepis jaegeri, Digitaria phaeotricha* and *Loxodera strigosa*. The dominant plant species in the closed forest and savanna are *Uapaca togoensis, Cola lateritia, Parinari excelsa, Ochna membranacea, Caloncoba echinata* and *Lophira lanceolata.*

Sub-montane flora include *Parinari excelsa, Anthonotha macrophylla, Aphimas pterocarpoides Daniella thurifera, Dissotis elliotii, Ctenium newtonii, Londettia kagerensis* and *Cyanatis longiflora*. (Cole 1974).

There are two protected areas within the montane ecosystem.

The wildlife is unique consisting of leopards, monkeys, chimpanzees, baboons, buffalo, pygmy hippopotamus, duikers, elephants and birds (Lebbie 2002).

1.3. Savanna Biodiversity

The savanna ecosystems found mostly in the north and northeast of Sierra Leone occupies about 35% of the country. (Cole 1968; 1974). Savanna is usually plagued by annual bush fires. Several types of savanna have been recognized including Forest Savanna, Mixed tree savanna and grassland savanna.

The dominant tree types are *Daniella oliveri, Parkia biglobosa, Cassia sreberiana, Lophira lanceolata, Borassus aethiopum, Terminalia albida* and *Vitex cuneata.*

Dominant grass plant species include *Andropogon gabonensis, Andropogon tectorum, Chasmopodium ceudata* and *Hyparrhenia ruffia*. There are three (3) protected areas within the Savanna ecosystem. These are the Outamba Kilimi National Park with an area of 984 Km^2, Bo plains and Port Loko plains both covering a total area of approximately 26m^2.

The typical Savanna wildlife include large mammals (elephants, leopards, hyenas, duikers, genet, civets, warthogs, aardvarks, chimpanzees, baboons, monkeys), over 250 species of birds, amphibians, reptiles and arthropods. Among the mammals, 6 are recorded as endangered, 5 as vulnerable and 6 threatened.

1.4. Agricultural Biodiversity

Sierra Leone is an agricultural country with about 70% of the working population employed in this sector and accounting for one-third of the Gross Domestic Product; GDP (GOSL 1994). The main thrust of GOSL food security policy is on efficient and sustainable production and poverty alleviation. 70% of the farming population cultivates rice. The area under cultivation is estimated as 409,674 ha and could expand by twice that amount when fully harnessed. (GOSL, 2002).

Sierra Leone's Agro biodiversity assets consist of some 70 crop species, and livestock. 16 crop species are grown all over the country. 75% of the arable land is devoted to rice production.

Sierra Leone's water resources are adequate with an annual average rainfall of 2000 mm and several river systems. The country's main stable food, rice, is produced in 5 distinct ecologies – uplands, inland valley swamps (IVS), mangrove, riverine grasslands and bolilands.

Two (2) types of crops are produced in Sierra Leone : Perennial crops and Annual crops.

The major perennial crops include oil palm (*Elaeis guineensis),* Cacao *(Theobroma cacao),* Coffee (*Coffea arabica; C. canephora – robusta; C. liberica; C. exselsa; C. stenophylla),* Coco Palm (*Cocos nucifera),* Rubber *(Havea brasilliensis*); Cashew *(Anacardium accidentale), Citrus (Citrus sinensis; C. orantifolio, C. limon),* Mango (*Mangifera indica*), Suga cane *(Saccharum officinale).* and Ginger (*Zingimber officinale*).

Rice (*Oryza sitiva*) is the main annual crop that is grown in over 300,000 to 400,000ha and produces 450,000 to 550,00mt annually. Of 31% GDP provided by the agricultural sector, rice alone contributes as much as 85% (Jusu and Bangura, 2002).

Other crops usually found intercropped with upland rice include Sorghum (*Sorghum margaritiferum),* Maize *(Zea mays*), Cassava (*Manihot spp*), Sweet potato *(Ipomea batata*), Yams *(Dioscorea spp),* Coco yam *(Xanthosa sagittifolium),* Cucumber (*Cucumis sativus*), Punkin (*Curcubita spp),* Tomato (*Lycopersicon esculentum),* Garden eggs (*Solanum melongees),* Beans (*Colocynthis circles*), Pepper (*Capsicum anuum*).

In the uplands, the slash and burn farming practice followed by short fallow periods has led to poor soil quality and erosion. Inland valleys and swamps are used to cultivate a variety of food and cash crops.

Livestock production is still largely free range or extensive. The ruminants consist of cattle, goats and sheep. The cattle is the Ndama breed. Attempts to introduce more exotic species have largely failed. In 1984 the estimates of ruminants were 33,200 heads of cattle, 264,000 sheep and 145,000 goats, There are an unspecified number of races of pigs and rabbits. The birds (poultry) include chickens, ducks, guinea fowl and pigeons.

Almost all categories of livestock were decimated by the war except in the few safe areas. At the end of the war (2001) Sierra Leone has to rebuild her agricultural base.

Aquatic biodiversity consists of flora and fauna in Wetlands (Inland Valley Swamps; IVS, Mangroves and Freshwater) and Coastal Marine Ecosystems.

2.1 Wetlands and Freshwater Systems

Bah (1994) estimated that there are 4,837.8 Km^2 of wetlands in Sierra Leone and in recent times has mapped out and identified 66 wetland areas (Bah Pers. Com). The vegetation consists typically of Freshwater swamps forests, riparian type and mangroves. Freshwater swamp forests are present all over the country and the typical tree species include *Mitragyna stipulosa, Raphia palma-pinnus, Calamus deeratus, Heritiera utilis* and *Rhychospora corymbosa*.

The riparian or gallery forest vegetation include species such as *Piptadeniastrum africanum, Uapaca togoensis, Pterocorpus santalinides, Brachystegia leonensis, Anadelphia leptocoma, Panacium congoensis* and *Cyperus pustulatus.*

An estimated 200,000 – 300,000ha of mangrove swamps fringe the coastline of Sierra Leone (Bah, 1994; Fomba, 1994).

The mangrove swamps of Sierra Leone are dominated by 5 species (*Rhizophora racemosa, L. harrisonii, R. mangle, Avicenia nitida* and *Languncularia racemosa*). Intermingled among the mangroves may be other plant species including *Paspalum vaginatum, Sesuvium portulacastrum* and *Philoxerus vermicularis. Rhizophora sp* often found seawards and *Languncularia sp* are found landwards.

A total of about 35,000 ha of mangrove swamps in the north are under rice cultivation and in the south 5,000 ha. There are proposals for the use of more mangrove swamps for rice cultivation.

There are several protected areas within the wetlands of Sierra Leone including 3 more proposed categories for protection; National Parks (Lake Sonfon, Lake Mape, and Lake Mabesi), Game Reserves (Yawri Bay, Bagru – Moteva creeks, Sewa – Wanje and Kpaka); Game Sanctuaries (Mamunta – Mayoso).

Sierra Leone's drainage system is very extensive and consists of a series of rivers running from North to South including the following: Great Scarcies, Little Scarcies, Rokel, Jong, Sewa, Moa and Mano. In addition, there are numerous streams including Ribi, Kukuli, Gbangbar and Wanje. The four(4) main estuaries are the Scarcies, Rokel, Yawri and Sherbro. There are also a number of Lakes (Mape, Mabesi), creeks lagoons and small estuaries.

The wetlands are very rich in animal life. An estimated 240 species of birds have been identified. About 200,000 migrant birds visit the wetlands annually (Becker,1994). 3 species of crocodiles (*Crocodylus niloticus, C. cataphractus* and *Osteolaemus tetrapsis*) are known to occur. The monitor lizard *Varamus sp* and pythons (*Phthon sebae, Python regius*) are well represented. The most important mammals are the otter (*Aonyx capensis*), the carnivores (*Potamogale velox, Atilax paludinosus), herbivores (Trichechus senegalensis)* and the pygmy hippopotamus *(Hexaprotodon liberiensis*). Mangrove and estuarine sediments are rich in invertebrate fauna including snails, bivalves, polychaetes, protochordate and Echinoderms (Aleem and Chaytor,1980; COMARAF, 1990; Ndomahina, 2002).

16 families of freshwater fishes have been identified with as many 100 species. The major river fish species include *Alestes longipinnis, Epiplatys fasciolatus, Hepsetus odoe, Sarotherodon kingsleyi, Ctenopoma kingsleyi, Polypterus palmas, Hemichromis fasciatus, Tilapia zillii, Tilapia monodi, Clarias lazera, Clarias laeviceps* and *Mormyrus macrophalus*. Lakes contain mostly catfishes including *Bagrus bayad, Synodontis nigrita, Clarias platycephalus, Clarias lazera* and *Chrysichthys furcatus* (Payne 1986).

There is an estimated biomass of 50,000 metric tones (mt) with a potential annual yield of 16,000mt. Bunce River has been proposed for protection in addition to Lake Mape and Mabesi.

2.2 Coastal and Marine Biodiversity

Sierra Leone's coastline is 560Km long and the shelf covers an area(to 200m depth) of 30,000km^2

The Exclusive Economic Zone(EEZ) is 155,700Km^2. Plankton studies indicate that there are 5 genera of dinoflagellates, 14 genera of diatoms, 2 genera of Chlorophyta (Aleem 1979) Bainbridge (1972) recorded 26 species of copepods, 9 species of Chaetognatha, 3 species of Protochordata, 2 species of Pteropods and 2 species Coelenterata, polychaetes and protozoa. 62 species of gastropods and 30 bivalves have been also identified (IMBO, 1996).

Other benthic fauna consists of a wide range of animals including Echinoderms, Gastropods, Bivalves, Crustacea, Polychaetes and protochordata. Seaweeds include *Caulerpa racemosa, Chaetomorpha pachynema, Lyngbya confervoides* and *Calothrix scopulorum*. Marine fish stocks consist of Pelagics, Demersals and shellfish (Longhurst, 1968; Edward, 2001). Pelagic fish stocks consist of small pelagics (*Ethmalosa fimbriata, Sardinella maderensis, Caranx hippos, Scomber scombrus* and *Albula vulpes)*. Large pelagics include *Xiphus gladius, Thunnus albacares* and *Auxis thazard.* Semi-pelagics consist of *Brachydeuterus auritus, Balistes capricus, Myctophum aeperum, Diaphus dumerilli* and *Lepidophanes guassi.*

The demersal stocks include *Pseudotolithus elongatus. P. senegalensis, Galeiodes decadactylus, Lutjanus agennes, Pagellus coupei* and *Dentex canariensis.*

Shellfish consists of crustacea and molluscs. The crustaceans include *Penaeus duorarum, Parapenaeus longirostris, Panulirium regius, Callinectes pallidus* and

Cardiosoma armatum. The molluscs include the cuttlefish (*Sepia officinalis, Sepia berthelotti)* and Molluscs (*Pachymelina, Crassostrea tulipa* and *Iphegenia laeviagatum).*

Over 200 species of finfish species have been documented in Sierra Leone (FAO, 1990). The contribution of various categories of fish stocks over the years are close to estimates provided by Coutin (1989) as follows : Small Pelagics (43 –55%); Demersals (30 – 40%); Large Pelagics (3%) and Shrimps (2%). The total biomass is estimated to be between 500,000mt and 700,00mt.
The estimated Maximum Sustainable Yield (MSY) is about 200,000mt.

Fish is a cheap source of protein for over 70% of the population. There are two (2) types of fishery in Sierra Leone; artisanal and industrial.

There are an estimated 20,000 artisanal fishers operating 6000 boats of different sizes and landing fishes at some 457 sites along the coast. The variety of gear type in use include ring nets, beach seines, cast nets, traps hooks and line. The industrial sector operates a number of vessels (demersal trawlers, shrimpers, canoe support vessels, purse seiners and long liners) and target mostly finfish and shrimps.

In 1990, 22% of the fish harvested came from the artisanal sector. In 2002 the artisanal sector accounted for 75% of all fish landed amounting to 46,000mt. 16,000mt is landed from the freshwater systems every year. Aquaculture is rudimentary and there are less than 20 ponds nation wide growing Tilapia and catfishes. Threatened species have been recorded among some coastal species including catfishes, snapper and sciaenids. Overexploitation and bad fishing practices are responsible for the present levels of threats.

C. THE VALUE OF THE BIODIVERSITY OF SIERRA LEONE

The value of the biodiversity of Sierra Leone is a reflection of the uses by man of the diverse resources found in various ecosystem types.

Sierra Leone is a predominantly agricultural country with agriculture sector contributing 31% GDP.

Hunter (1989), UNDP (1992) and Mnzava (1992) detailed the deteriorating macroeconomic situation in the country. In 1987 a positive trade balance existed but turned negative in 1988. In 1989 debt amounted to USD 1057 million, equivalent to 118% GNP. Interest arears totaled USD 108 million yet debt servicing amounted to only USD 4 million. Since then the situation has
deteriorated.

With the onset of the war in 1991 agricultural export collapsed. Mineral export stopped in January 1995 when the Rutile and Bauxite mines were attacked. Both Rutile and Bauxite contributed about 65% to the total export earnings of the country. The rate of inflation has continued to increase by the year. In 1982, the exchange rate was USD 1 to the Leone. In 1995 it was UDS 1 to Le635 and by October 1995 it was USD 1 to Le1000. At the moment (2003) the exchange rate is USD 1 to Le2400.
The Forest Resource is a significant contributor to the National economy, both in monetary terms and indirect benefits.

In monetary terms Allan (1992) compared Agriculture with Forestry Fisheries and Livestock

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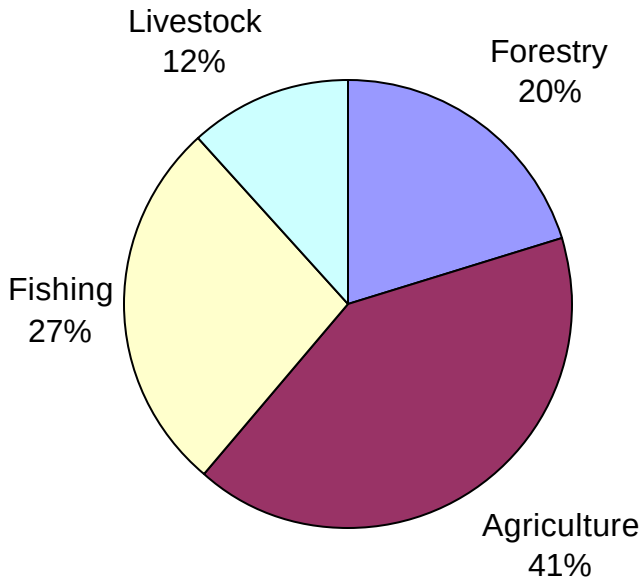
Fig.1 Relative Finanicial contributions of various sectors (Forestry, Agriculture, Fishing and Livestock)



The agro-biodiversity is impressive. 75% of arable land (600,000ha) is devoted to rice production. Out of some 70 crop species, 16 are cash crops grown in various ecologies all over the country. Among these are indigenous and improved varieties. The livestock consisting of cattle (large and small ruminants), piggery and poultry products represents a vast repository of genetic resources.

Vast freshwater and marine fishery products constitute cheap sources of protein for about 70% of the population and provide jobs for as many as 200,000 people (Kamara, 1991). There is a vast aquaculture potential that are yet to be fully exploited.

The country's forestry resources are derived from the present day forest cover representing barely 5% of total area. There are in addition a number of forest reserves where timber exploitation takes place. A large part of the rural population depend on

wildlife cropping targeting animals including mammals, birds, reptiles, frogs and insects. Apart from the direct consumptive value to the croppers themselves, the bush meat trade is very widespread today.

Local communities also forage for a variety of products for use as foodstuff, fuel (fuel wood and charcoal), construction materials, thatching and roofing materials, ropes, crafts, medicinal plants, fodder, recreational materials (raffia, ornaments), spices, perfumes, poisons, composts, herbicides and insecticides.

The wildlife parks and reserves could serve to increase the ecotourism potential.
The rich biodiversity affords opportunity for research. There are cultural and spiritual values attached to certain elements of biodiversity such as the existence of sacred grooves for initiations into secret societies.
Traditional healers depend on medicinal plants to cure various ailments at the community level.

The country's forest resources though heavily depleted during the war contributes significantly to the economic development of the country. Forestry contributes about 9.3% to the GDP, but this calculation exclude non monetary benefits such a fuelwood collected by rural people, non timber forest product such as medicines. Tourism from National Parks and Game Reserves are a latent demand yet having great potentials. When all these are compiled the contribution of the forestry sector could be a high as 15%.

Unfortunately the budgetary allocation made to the Forestry Division which has jurisdiction over 8% of the land area of the country amounts to only Le800 million. About 80% of this amount is allocated for salaries with very little amount to undertake field activities.

At present there is a 95% dependency on donor support to undertake forestry programmes. Detailed analytic data is only available for the year 1995/96 (Table Ia and Ib).

Table Ia Budgetary Estimates 1995/96. Government Funds (Leones).

Particulars	**General Administration and support services**	**Management and Wildlife Conservation Part I.**	**Management and Wildlife Conservation Part II**	**Total (Leones)**
Personnel Salaries	4,633,478	59,232,681	32,960,850	96,827,809
Other Relevant Expenditure	10,122,900	8,085,900	6,578,200	24,790,000
Capital	1,050,000	360,000	200,000	1,610.000
Total	15,806,378	67,681,581	39,739,050	123,227,009

Table Ib. Budgetary Estimates 1995/96 - Development/Donor Fund (Leones)

Details of Development Estimates(Cash Grants)	**Donor**	**Amount**	**% of Total Budget of Forestry Division**
National Forestry Action Plan	UNDP	1,308,120.500	55
Wildlife and National Parks Development – Kenema	UKODA(Suspended)	771,389,000	33
Gola Rainforest Conservation	Bird life International	24,345,000	1
Chimpanzee Rehabilitation	EC	150,936,000	6
Total		2,254,790.500	95

D. MAJOR THREATS TO BIODIVERSITY IN SIERRA LEONE

Inspite of the diversity of ecosystem types, the major threats to biodiversity in Sierra Leone are mostly due to anthropogenic activities. These threats have been exacerbated by the 10-year civil conflict (Coker and Kamara, 2002).

The range of activities constituting major threats to biodiversity include Agriculture, Livestock farming, Forest exploitation, Fishing, Energy exploitation, Mining, Transportation, Urbanization (infrastructure development) and Waste disposal.

There was disproportionate distribution of population pressures as a result of the war. The mass illiteracy inappropriate policies and weak institutional arrangements are among the greatest threats to biodiversity.

The agricultural practice of shifting cultivation involving slash and burn method and forest exploitation for fuel (fuelwood, charcoal) and timber production has reduced the forest cover from 70% in 1900 to merely 5% in 1990 (Grubb et al 1998).

There are today forest regrowth constituting 60% of the total area. Artisan diamond mining activities has led to considerable habitat loss and increased erosion in the Eastern and Southern regions.

Industrial mining operations for diamonds, bauxite and rutile have involved clearance, excavation and flooding of farmlands. There is usually evacuation of people and threat to cultural heritage. The civil conflict and mass displacement of people led to increased pressure on natural resources by the Internally Displaced Persons (IFPs) and subsequent loss in biodiversity.

Habitat fragmentation by the transport sector is an important source of threat to biodiversity. The railway was phased out in 1971. Sierra Leone has approximately 11,330Km of roads of which 1,260Km is paved; 5,820 Km graveled trunk roads and

4,250Km feeder roads. More feeder roads are to be constructed to service the agricultural sector.

Fragmentation, loss of bottom sediment integrity and over-exploitation are a result of increased and poorly regulated fishing activities. Urbanization increased population pressure poor pollution and waste management procedures are further threats.

E. LEGAL AND POLICY FRAMEWORKS FOR BIODIVERSITY CONSERVATION AND SUSTAINABLE USE.

The need for biodiversity conservation and sustainable use of natural resources has been recognized in Sierra Leone since the colonial periods. The various pieces of legislative framework laid down were more sector-focused particularly in three areas; Forest biodiversity (1942), Agro-biodiversity (1946) and Marine biodiversity (1932).

The closest any regime came to comprehensive policy was the enactment of the Wildlife Conservation Act, 1972.

There are various sectoral pieces of legislation over the passed years that incorporate elements of biodiversity including:

- Forestry rules (1942; 1946; 1955);
- Forestry Ordinance (1960);
- Forest Industry Corporations Act (1992) as amended (1990);
- Fisheries Control and Preservations Act (1932);
- Fisheries Management and Development Act (1988) as amended (1990);
- Fisheries Management and Development Act (1994);
- Guma Valley Water Company Act (1980);
- Sierra Leone Maritime Administration Act (2000);
- Merchant Shipping Act (2002);
- Mines and Minerals Act (1994);
- National Environment Protection Act (2000).

The Government of Sierra Leone (GOSL) has ratified a series of International Conventions Treaties and agreements including :

- Convention on International Trade in Endangered species of Wild Fauna and Flora (CITES)
- Convention on Wetlands of International Importance (RAMSAR,…)
- United Nations Convention on the Law of the Sea (1982);
- Convention of the International Maritime Organization (IMO); 2001;
- Convention Covering the Protection of the World Cultural and Natural Heritage ( );
- United Nations Convention to Combat Disertification (CCD);
- United Nations Framework Convention on Climate Change (UNFCCC);
- Vienna Convention for the Protection of the Ozone Layer;
- Montreal Protocol on Substances that Deplete the Ozone Layer and the London Amendments to the Montreal Protocol on Substances that deplete the Ozone Layer;
- Basel Convention on the Control of Trans-boundary Movement of Hazardous Waste and their Disposal;
- Convention on Biological Diversity;
- Convention on Biosafety;
- Convention for the Prevention of Pollution from Ships (MARPOL 73/78);

GOSL is also signatory to certain regional agreements including:

- Convention on the African Migratory Locust;

- Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management within Africa of Hazardous Wastes;

- Convention Establishing a Permanent Inter-State Committee for the Control of Draught in the Sahel (CILSS);

- Protocol Concerning Co-operation in Combating Marine Pollution in cases of Emergency in West and Central African Region (WACAF); and

- Abuja Memorandum of Understanding on Port State Control.

The Ministry of Foreign Affairs and International Corporation has been making effort to ratify more conventions.

F. INSTITUTIONAL RESPONSIBLITIES AND CAPACITIES

The Management of Biodiversity in Sierra Leone including the Conservation, Sustainable use and Equitable Sharing of Benefits has up-to-date never been assigned to any specific agencies. It has adopted a sectoral approach involving line Ministries, Government Agencies and NGOs.

The institutions bearing the greatest responsibilities for biodiversity management include Ministry of Agriculture, Forestry and Food Safety, Ministry of Fisheries and Marine Resources, Ministry of Transport and Communications and Ministry of Lands Country Planning and Environment.

Those government institutions usually have various departments/divisions involved with biodiversity management.

In general government institutions are plagued by problems including staff shortages, shortages of skilled staff, financial resources scarcity, lack of adequate logistic support.

Ministry of Agriculture, Forestry and Food Security (MOAFFS)

The Ministry is charged with the overall responsibility for the management of the natural terrestrial ecosystem resources and food production. There are a number of important Divisions and several units. Research and support services are provided by institutions including National Agricultural Research Co-ordinating Council (NARCC), Institute of Agricultural Research(IAR), Njala University College (NUC) and NGOs).

The three Technical Divisions of the MOAFFS are Agriculture, Livestock and Forestry. The two service Divisions are Land and Water Development and Planning Evaluation Monitoring and Statistics Division.

Agriculture (Crop) Division

This Division through crop husbandry and protection programmes and the Livestock Division together are charged with the responsibility of ensuring food security nationwide on a sustainable basis as part of the poverty alleviation strategy. The strategy is to encourage local farmers to adopt new technology through extension services and the provision of farming inputs such as tools and fertilizers. Large-scale farming of rice and cash crop production is also to be embarked upon.

The sections/units found within the Agriculture Division include Staff Development and Training, Crop Protection, Produce Inspection, Agricultural Engineering, Fertilizer, Horticulture and Agricultural Communication Unit.

The Division consists of an inadequate number of highly trained professional and technical staff including extension workers. This division is chronically understaffed and under-funded. GOSL has however allocated Le3,980.5 million to this section in 2003.

Livestock Division

This Division is responsible for animal health and animal production. The livestock has been almost completely decimated by the war and restocking has been embarked upon.

The diagnosis, treatment, and prevention of diseases as well as inspection of animal products are usually carried out by veterinarians. Veterinary officers are supposed to be stationed at regional and district levels. The livestock section is very chronically understaffed and under funded. The technical staff and extension workers are also largely untrained. The GOSL has allocated Le665.1 million (2003) to the Verterinary Services Division.

Forestry Division.

This division is charged with the responsibility of management of the forestry resources. The mandate also includes the timber resources in reserved areas.

The workforce is about 300 strong of which 50 are highly trained consisting of Researchers, Educationists and Foresters. There are Trained Technical and Vocational staff including Supervisions, Forest rangers and Forest Guards. The annual budget to this section from GOSL is Le862.9million.

The section is grossly understaffed and under funded.

Wildlife Branch.

The mandate of this section includes the sustainable management of the wildlife resources. This section works in close association with the forestry division and has a staff strength of about 30. The staff requirement is believed to be over 200.
The annual (GOSL) contribution to this sector about Le80 million 2003).

The statutory responsibility of management of existing and proposed Game and Wildlife Parks and sanctuaries falls under the Wildlife branch. However because of lack of adequate funding by GOSL to this sector, management of Wildlife sector is been carried out by the International and Local NGOs.

Land and Water Development Division

This Division is mandated to appraise land and water resources for their suitability for agricultural purposes providing information and technical support for improving the use of land, soil, water and climatic resources.

Several sections/units under this Divisions include Soils, Agronomy, Water Resources, Agro-Climatology, Central Services and Seed Multiplication.

There are a network of small laboratories, and agro-climatological stations, libraries and support facilities. Like all government agencies this section is understaffed and under-funded. GOSL allocation to this section (2002 – 2003) was about Le900 million.

Planning Evaluation Monitoring and Statistics Division

This Division was established as part of the Agriculture Sector Support Project. There are three sections (Planning and Budgeting, Monitoring and Evaluation and Statistics).

The Planning and Budgeting Section is responsible for the formulation of policies and strategies on agricultural development. It also advices and co-ordinates investment programmes.

The programmes and their impacts on agricultural projects are monitored and evaluated by the Monitoring and Evaluation section.

The statistics section is responsible for data collection, analysis and forecasting of annual production. It also provides the basis of an early warning system on the status of national food security. GOSL allocated Le300 million to this section.

Agricultural Research and Support Institutions

There is strong research and technical support from allied institutions such as National Agricultural Research Coordinating Council (NARCC), Institute of Agricultural Research (IAR), Rice Research Station (RRS), University of Sierra Leone particular Njala University College (NUC). GOSL support to Agricultural institutions for 2003 amounts to Le963.8 million.

National Agricultural Research Co-ordinating Council (NARCC)

Conflicting and overlapping mandates, duplication of resources among government agencies and support institution led to the establishment in 1985 of the NARCC by the Government of Sierra Leone (GOSL) in 1985.

NARCC formulates polices, set research priorities and makes recommendations to GOSL. It also co-ordinates research activities and maintains a documentation centre. It has only two senior officers and a finance department.

Institute of Agricultural Research (IAR)

IAR was established after the termination of the American funded adaptive crop research and extension (ACRE) Project in 1988. IAR conducts research on major crops other than rice. It adapts a farming systems Research/Extension approach. IAR has collaborative links with NUC, Fourah Bay College(FBC), International Institute of Tropical Agriculture (IITA),Semi-Arid Food Grain Research and Development (SAFGRAD), West African Rice Development Association (WAARDA),

International Crop Research Institute of Semi-Arid Tropics (ICRISAT)and EEC

IAR has a decentralized research team in each of six zones (Rokupr, Kabala, Makeni, Magbossi, Njala and Kenema).

There are seven constituent departments.

- Crop improvement
- Resource Management
- Training and Information
- Crop Management
- Socio-economic Research
- Food and Nutrition

- Technology Transfer

The core staff of IAR comprises a Director, 13 Research Officers and 10 Research Assistants. During the war the infrastructure was devastated necessitating a massive rehabilitation progamme. Funding remains the greatest problem.

Rice Research Station (RRS)

The station was established by the colonial office in 1934 to conduct research into mangrove swamps. In 1953 it became the West African Rice Research Institute (WARRI). It was transferred to NUC in 1964 but later reverted to the Ministry of Agriculture in 1971 with an expanded mandate to conduct research into other gains other than rice such as sorghum and millet. The station has many divisions including Varietal Improvement, Agronomy, Crop Protection, Farming System and Farm Management and Agricultural Engineering.

With the headquarters located at Rokupr, RRS, maintains outstations at Makeni, Kabala, Blama/Kenema, Rotifunk and Bo.

There are collaborative programmes with many other research organizations including WARDA, IITA, ICRAF, IAR, NUC, and NGOs.

Njala University College(NUC)

NUC was established in 1964 and has three faculties and several academic departments. These three faculties are Agriculture, Education and Environmental Sciences.

NUC carries out basic and applied research with strong collaboration with IAR and RRS. Most of the research personnel at IAR and RRS were recruited from NUC.

Non Governmental Organizations (NGOs)

Of about 56 NGOs involved in conservation work, the most important are the Conservation Society of Sierra Leone (GOSL), Council for Human Ecology of Sierra Leone(CHECSIL) and the Environmental Foundation for Africa (EFA). Other are concern with other aspect of socio-economic development but occasionally include conservation in their work.

The well-organized NGOs are usually involved in activities such as Research, Awareness Raising, Community –Based programmes and Restoration work. The annual budget from donor funding for biodiversity programmes as probably morethan USD 5 million.

Ministry of Fisheries and Marine Resources(MFMR)

The Ministry has as its primary mandate the provision of cheap source of protein for the majority of Sierra Leoneans, thus contributing towards the improvement of national nutrition and food security.

The coordination and management of the rich and diverse aquatic resource (marine, freshwater) are the responsibility of the MFMR which is at the moment also responsible for the Monitoring Control and Surveillance of our territorial waters.

The fishery of Sierra Leone can from a management perspective be divided into two sections: Artisanal and Industrial.

Artisanal or canoe fishermen operate close to the coast within 5 miles offshore (Inshore Exclusion Zone). There are more than 400 landing sites along the coastline and an unknown number inland. There are an estimated 20,000 artisanal fishers operating some 6000 boats of different sizes and designs. A variety of gear types are also in use.

The industrial fisheries sector operates a number of vessels (Demersal trawlers, Shrimpers, Canoe support vessels, Purse seiners and Liners).

Embedded in the policy and strategy is the conservation and enhancement of environmental quality and sustainable management of rich biodiversity of wetlands, lakes, rivers, beaches, estuaries, bays, lagoons and inlands. The FAO code of Conduct for responsible fishing has also been adopted.

There has been several donor support to this sector for specific projects from sources such as FAO, GTZ, DFID, ADB, and Worldbank. There is also collaboration been several Government institutions such as Environment Ministry Transport and Communications, Agriculture and NGOs. The Institute of Marine Biology and Oceanography (IMBO) of the University of Sierra Leone has a special link with MFMR.

Proposals exist for the establishment of Marine. Protected Areas in addition to existing ones and should require more staff. Among the staff are highly trained professionals. The MFMR is however understaffed eventhough among the staff are highly trained professionals.

The present workforce (2002/03) is 209 with the current annual GOSL contribution of Le600 million. Revenue from this region is estimated as USD 2 million (2002/03) annually.

Institute of Marine Biology and Oceanography(IMBO)

IMBO was established in 1966 with financial assistance largely from UNESCO. The colonial laboratory known as the West African Fisheries Research Institute (WAFRI) in 1952 was transferred to the Department of Zoology, Fourah Bay College (FBC) since 1961. In 1966 IMBO became fully autonomous within the University of Sierra Leone

IMBO has over the years provided training at middleman technical level leading to a Diploma in Aquatic Biology and Fisheries (Undergraduate), as well as courses leading to the B.Sc (Honours) degree in marine Sciences. Post-graduate research work can also be undertaken – IMBO has undertaken research in diverse fields such as Marine Biology Fisheries Sciences, Marine Pollution, Chemical, Geological and Physical Oceanography.

IMBO has a very special relationship with MFMR. IMBO has highly qualified professional staff consisting of Lecturers and Technicians. In addition, there is a close collaboration between IMBO and other science departments at FBC and NUC.

Ministry of Transport and Communications

Cognizant of the contribution of the transport sector in habitat fragmentation and loss as well as the introduction of pollutants into the environment, the GOSL has set up some structure to mitigate the effect of these factors.

Co-ordination and Monitoring Unit(CMU)

In 1996 the World Bank recruited an environmental specialist in the CMU of the Ministry of Transport and Communications to ensure that various projects funded by the World Bank under the Transport Sector Project are implemented in an ecologically sound and sustainable manner. Two stakeholders workshops have been held by the CMU in 1988 and 2000 which now form the basis for the formulation of a comprehensive National Transport Sector Environmental Policy. The CMU has a staff strength of 8 and is funded by the World Bank. The annual budget is variable. In order to fulfill their mandate the estimated budget (2002/2007) is USD 44.9 million over the 5 year period for the CMU.

Sierra Leone Maritime Administration (SLMA)

With the aid of the International Maritime Organization (IMO) the SLMA was set up in 2000.
The SLMA has among its mandates the following :

- Ensuring the ratification of any International Maritime Conventions;
- Ensuring the elaboration and passage of various laws;
- Registration of shipping and fishing vessels;
- Certification and inspection of sea worthiness;
- Determination and the prevention of marine source pollution;
- Protection of the Marine Environment;
- Response to Marine Environmental incident.

The SLMA has a staff strength of 30 at the moment (2002/2003) and recruitment is still ongoing of highly trained technical as well as support staff. Funding is derived from freight levy and now
amounts to USD 1.922,3994 (2002/2003).

Ministry of Lands, Country Planning and the Environment (MLCE).

In response to environmental issues, the harmonization and co-ordination of the various sector-focused laws and activities, the GOSL set up the Environmental Protection Section (EPS) in the Ministry of Lands Housing and the Environment in 1985.

The EPS prepared a National Environmental Policy (NEPA) document in 1994. This document was directed toward specific areas including:

- Land Tenure Land Use and Soil Conservation
- Water Management
- Forestry and Wildlife

- Biodiversity and Cultural Heritage
- Coastal and Marine Resources.

The National Environmental Protection Act (NEPA) has been enacted in 2000 followed by setting up of an Environmental Board.

Under the First Schedule of the NEPA an Environmental Impact Assessment (EIA) licence is required for any project whose activities could constitute major threats including:

- Substantial changes in renewable resources
- Substantial changes in farming and fisheries practices
- Infrastructure
- Waste Management and Disposal

The second and third schedules of the NEPA determine whether a particular project requires an EIA, and if so what should be contained as part of that EIA. The EIA also requires that mitigation plans for the projects be submitted.

A document of EIA guidelines has now been developed and widely circulated by the Environmental Division of the Ministry of Lands, Country Planning and the Environment.

The Environmental Protection Section (EPS) has now been upgraded to an Environmental Division with a total workforce of 15(2003). The GOSL annual budgetry allocation to this sector is about Le200 million (2003).

The division is grossly understaffed and underfunded.

Institutional Arrangements for the Implementation of Strategic Recommendations

In order to streamline and coordinate all activities related to the implementation of the NBSAP, a Biodiversity Coordination Unit is hereby proposed. The unit will be established in the Ministry of Agriculture, Forestry and Food Security with the Minister as the political head.

The unit will eventually comprise a Biodiversity Coordinator who will be the officer responsible for the day to day administration of the unit. He will be supervised by an Inter-sectoral Steering Committee on Biodiversity consisting of various institutions and stakeholders with major responsibility of policy formulation and guidance. A Technical Advisory Team in the four thematic areas (Forestry, Agriculture, Wildlife and Marine) will also form part of the Management team.

The Ministry of Agriculture, Forestry and Food Security will house the Secretariat and provide office facilities.

The implementation of thematic strategies and activities in the NBSAP will be coordinated by the relevant ministries and NGOs concerned. Every effort will be made to minimize duplication of resources by ensuring strict monitoring of programmes.

The Biodiversity Coordination Unit will provide the lead in coordinating and facilitating the cooperation of different stakeholders. All efforts will be made for the decentralization of programme activities, so that local communities, NGOs and local authorities will be delegated responsibilities.

The inter-sectoral Steering Committee shall comprise at least 15 representatives from relevant Government Departments, NGOs, The private sectors and local community. The Committee will report directly to the relevant ministers in the ministries concerned. In consultation with the relevant committees and working groups the committee will have overall implementation responsibility. The Biodiversity Coordinator will act as Secretary to the Committee.

The Technical Advisory Committee will assist the Steering Committee by providing relevant technical advice in the four main thematic areas : (1) Forest Biodiversity, (2) Agricultural Biodiversity (3) Wildlife Biodiversity (4) Marine Biodiversity. The committee shall comprise at least 8 persons for their respective thematic competent enough to provide technical advice to the intersectoral Steering Committee.

Essentially the secretariat shall be headed by a Programme Coordinator, four (4) progamme officers for the four thematic areas, a secretary, a finance officer a driver and a messenger. The coordinator will report to the chairman o the committee who will be appointed at a meeting of the Steering Committee.

The secretariat will provide administrative and professional support to the Steering Committee. It will also act as a clearing house for biodiversity related issues and channel all communication for the CBD Secretariat to the relevant ministries and stakeholders.

The Government will provide much needed support to the secretariat and line ministries jointly involved in the programmes leading to the conservation and sustainable use of biodiversity.

III. GOALS AND OBJECTIVES

A. THE OVERALL VISION

The overall biodiversity vision for the Republic of Sierra Leone as embodied in the National Long-term Perspectives studies Project – Vision 2025 aspires for sustained exploitation and utilization of natural resources, maintenance of environmental quality and its aesthetics. Such vision should lead to a well-planned, clean and beautiful country and foster rational exploitation of natural resources.

B. GOALS AND STRATEGIC OBJECTIVES

The overall goal of the National Biodiversity Strategy Action Plan (NBSAP) is to seek conservation measures that provide the solid framework for the sustainable exploitation of Sierra Leone's biodiversity for the benefit of present and future generations.

Sierra Leone has as its top priority the socio-economic development of its people through the eradication of poverty and the sustainable development of its economy. These priorities, in parallel with the national environmental policy, provide the milieu within which the objectives of the Convention on Biological Diversity(CBD) can be achieved; the conservation of biodiversity; the sustainable use of biological resources; fair and equitable sharing of benefits arising from the utilization of genetic resources. The present state of peace and stability in Sierra Leone provides an enabling environment within which this vision can be achieved. At the end of 2025, the reconstruction and development of Sierra Leone would be possible if ardent strides are made in the conservation and sustainable utilization of its biodiversity. The achievement of this vision will hinge upon the participation of a well informed civil population through the implementation of the following objectives by 2025.

- Review, revise and enact the appropriate legislation on biodiversity, updating and harmonizing sectoral laws and introduce institutional reforms for the sustainable management of biological resources;

- Establish and properly manage all protected areas (national parks, wildlife sanctuaries, strict nature reserves) in representative ecosystems across the country.

- Maintain essential ecosystem services and biological resources to sustain the growing population dependent on the use of biodiversity;

- Create jobs through the conservation and sustainable utilization of biodiversity;

- Create a fair redistribution of benefits and opportunities arising from the conservation and sustainable utilization of biodiversity;

- Develop the human capacity and provide a conducive environment for the participation of all stakeholders (Civil Society, Traditional Rulers, Educational Institutions, NGOs Government Agencies, Researchers)in the conservation of biodiversity.

- Rehabilitate all mined-out and degraded areas for the restoration of native biodiversity;

- Prevent the introduction and spread of harmful alien and genetically modified organisms;

- Improve the general understanding of biodiversity through research, public education and awareness;

- Participate in and promote the sustainable utilization and conservation of biodiversity at the international level;

- Establish mechanisms for assessment of state, trends and threats to biodiversity and to work out measures of mitigation;

- Establish germplasm or gene banks;

- Establish ex situ conservation sites; and

- Mobilize adequate financial resources for the purposes of conservation and sustainable use of biodiversity.

C. SECTOR-SPECIFIC CONSERVATION GOALS AND OBJECTIVES

Various documents underscore the need for the conservation and sustainable use of biological diversity including, National Environmental Policy (1994), National Environmental Action Plan (2002), Vision 2025, SLMA Act (2002), Fisheries Policy (2003) and Agricultural Policy (2003). National Forestry Acton Plan (1999). There has evolved a series of sector focused policy goals and objectives which are in a way related to the conservation and sustainable use of biological diversity.

The overall Natural Resource Management Policy of the GOSL are two-fold.

- To promote the rational and sustainable use of natural resources thereby protecting them from further damage; and

- To rehabilitate those areas of the country that are now affected by severe land vegetation degradation and soil erosion.

Some major sectoral policy objectives of relevance to biodiversity are as follows :

Agriculture Sector:

The efficient and sustainable production for national food security and poverty alleviation is the policy goal. The objectives depend on production pattern.

Crop production: To increase food crop and cash crop production in ecologies (especially inland valley swamps, mangrove swamps and riverian grasslands) in which the area under cultivation can be increased significantly without damaging the environment considerably.

Livestock production: To achieve self sufficiency in domestic animals and animal Products through increased production by reestablishing the resource base and promoting the integration of crop and livestock production activities, with emphasis on promoting draught animal power and the use of animal manure by small scale farmers.

Forestry and Wildlife Sectors

The policy goal is aimed at achieving self sufficiency in timber, fuelwood and wildlife products while at the same time conserving the country's natural resources.

The forestry regulation policies are found in the Forestry Act (1988) and the Forestry Regulations (1990). Both the Act and Regulations give adequate powers to the Forestry Division for the Management and Protection of forestry resources and communally owned forests.

The policy objectives will be directed towards:

- Enhancing the role of agroforestry in food production and food security;

- Accelerating the process of nutrient replenishment for continuous crop production;
- Protecting watersheds in order to ensure adequate water supplies for future natural needs;

- Conserving and protecting indigenous flora and fauna inorder to preserve biodiversity;

- Contributing towards providing employment and income-generating opportunities for the rural population;

- Encouring the development of alternative source of energy other than wood and the development of more efficient methods of energy use;

- Raising the general level of Conservation awareness through Conservation education programmes;

- Restoring and revitalizing the capacity of the Forest Division to protect and manage the Natural Forest estate;

- Encouraging the development of communal forest management;

- Expanding the area of reserved land, wherever possible, with priority to watershed and unstable terrain;

- Restoring the degraded areas of existing reserves to productive forestry by the most cost effective means;

- Promoting, wildlife conservation by developing National Parks, Game reserves, and wilderness recreational facilities and ex-situ areas (botanical gardens, gene banks);

- Encouraging, game farming and ecotourism and peoples participation in integrated forestry and wildlife management of reserved forest areas.

Coastal and Marine Resources Sector

The goal is to maintain and improve the environmental quality of coastal and marine ecosystems and ensure the conservation and development of their resources so that the viability of all aspects of these ecosystems are secured.

The objectives as stated include:

- Expand environmental monitoring and assessment programmes so as to maintain ecological diversity and productivity in the coastal and marine areas;

- Strengthen programmes for the identification and study of the flora, fauna and economic resources of the coastal and marine ecosystems;

- Ensure the exploitation of coastal and marine fisheries resources on a sustainable yield basis.

Fisheries Sector

The fisheries policy goal recognizes that responsible fisheries management is essential for sustained development of the fisheries resources and its economic benefit for the welfare of its stakeholders.

The policy objectives include:

- To improve national nutrition and food security based on sound ecological principle and responsible fishing practice; and

- Conservation and enhancement of fisheries ecosystem, to conserve the variety of richness of the marine and freshwater resources.

Water Resources Sector

Policy goals are to ensure adequate quantity and acceptable water quality to meet domestic, industrial, transportation, agricultural and fisheries demand.

The policy objectives include:

- To undertake measures for the control of erosion of floods and for watershed management, including aforestation and prevention of pollution of water bodies

IV. THE NATIONAL BIODIVERSITY STRATEGY

A. INTRODUCTION

The National Biodiversity Strategy of the GOSL having taken into account several factors including, the current status of biodiversity within the major ecological belts in the country sources of threats to biodiversity, pressures on the resources and options and priority actions needed for ensuring the conservation and sustainable use and equitable sharing of biological resources, seeks to lay down a viable framework for the reduction in the rate of loss of biodiversity.

The role of the resource users or stakeholders is recognized and their capacity is to be greatly enhanced. The linkages and consultations among Government Ministries, Agencies, including NGOs and resource users is to be greatly strengthened. Both regional and intenational cooperation is also strongly advocated.

The strategies are divided in two broad categories, the thematic strategies and general measures (i.e. cross-sectoral strategies). This is in line with the guidelines laid down by the Convention on Biological Diversity (CBD) (2001). The main thematic areas considered are Wildlife, Forest Biological diversity, Agricultural biological diversity, Inland water biological diversity and Marine and Coastal biological diversity.

The cross-sectoral strategies cover cross-cutting issues including policy legislation, Capacity building, Public participation, Planning, Monitoring, Protected areas Conservation, Sustainable use, Incentive measures, Research and Training, Public Education, Impact assessment, Access to Technology, Information Exchange, Sharing of Benefits, Indigenous knowledge and Financial resources.

The NBSAP adopts a participatory approach and seeks to impress on all stakeholders the need for conservation sustainable use and equitable sharing of benefits of biodiversity.

Awareness raising at community level has been stressed. The strategy recognizes that illiteracy, mass poverty and the 10 year brutal civil conflict that led to the displacement of

a large populations with the breakdown of law and order underscores the need for conservation measures as a matter of urgency.

Priority needs to be addressed by the adoption of appropriate strategies include; training, research, capacity building, appropriate policy, legislative and monitoring and enforcement and sufficient funding.

B. SUMMARY OF THEMATIC (SECTORAL) STRATEGIES

The thematic areas considered in this section on strategies proposed in the NBSAP are terrestrial biodiversity (Wildlife), Agricultural biodiversity, Inland water ecosystem, Marine and Coastal biodiversity including fisheries and forest biodiversity.

1. Terrestrial Biodiversity

1.1 Wildlife, Game Reserves, Parks and Sanctuaries

Issues and Gaps:

- Lack of comprehensive up-to-date knowledge of the biodiversity of the Wildlife of the various terrestrial ecosystems;
- Lack of up-to-date information on the taxonomy, species richness, degree of endemism and vulnerability of major taxonomic categories in existing and proposed wildlife Game reserves, Parks and Sanctuaries;
- Lack of proper inventory of wildlife population in the country;
- Lack of an up-to-date wildlife Act and Policy;
- Lack of adequate human resources and institutional capacity for wildlife management;
- Lack of a centralized mechanism for the coordination of wildlife management among various agencies;
- Lack of awareness and low key participation by the community in wildlife management;
- Lack of monitoring and adequate law enforcement mechanism in conservation work; and

- Lack of adequate financial resources for Government and private institutions for wildlife management activities.

Strategies:

(i) Undertake a comprehensive up-to-date scientific study of the biodiversity of the major ecologies;

(ii) Establish an up-to-date database on major key species, their richness, degree of endemism and conservation in proposed and existing reserves and parks;

(iii) Undertake nationwide inventory survey of wildlife population;

(iv) Review and enact an effective policy and Wildlife Act;

(v). Establish an effective framework for human resource and institutional capacity development for wildlife management;

(vi). Establish a centralized mechanism for the co-ordination of all wildlife activities nationwide;

(vii) . Promote awareness raising activities and empower the local communities to manage parks, and reserves;

(viii). Ensure sustainable harvesting and utilization of wildlife resources;

(ix). Establish an effective monitoring and enforcement mechanism for conservation especially in protected areas and empower local communities to conserve wildlife outside reserves; and.

(x) Actively seek and provide funding for wildlife activities.

1.2 Forest Biodiversity

Issues and Gaps:

- Pressure mainly due to urbanization, increased population and IDP activities;
- Lack of enforcement of Forestry laws and regulations;
- Lack of community byelaws for the harvesting of forest products;
- Uncontrolled bush fires;
- Illegal logging activities;
- Lack of Public awareness on forest conservation issues;
- Tree cutting for charcoal and firewood;
- Lack of human resources especially at the technical level and institutional capacity to manage forest resources;
- Poor farming systems and encroachment;
- Lack of knowledge on the regeneration of native tree species;
- Uncontrolled mining activities;
- Lack of proper inventory of forest resources in the country;
- Overgrazing; and,
- Proliferation of power chain saws in the harvesting of forest products.

Strategies:

(i) Ensure that urbanization is well planned and co-ordinated;

(ii) Strengthen and ensure success of the ongoing resettlement programmes;

(iii) Ensure that the forestry laws and regulations for forest management systems are enforced;

(iv) Promote and enhance those measures that could minimize or mitigate negative impacts of anthropogenic activities leading to forest degradation and loss;

(v) Promote and encourage community participation in forest management;

(vi) Enhance and promote reforestation activities at local community level;

(vii) Undertake public awareness/education campaign at the community level;

(viii) Undertake research programmes on the regeneration of native tree species;

(ix) Undertake training and recruitment of Forest Rangers, Surveys and Field Technicians;

(x) Undertake forest inventories/surveys to ensure sustainable utilization of forest biodiversity; and,

(xi) Restrict/control power chain saws by providing appropriate technologies and regeneration system that enhance forest biodiversity.

1. 3. Agricultural Biodiversity (Plant and Land Resources)

Issues and Gaps:

- Deliberate Government policy of attaining food self-sufficiency by 2007 without necessarily promoting agricultural biodiversity;
- Emphasis on rice production and plans to use a wide range of ecologies for the purposes;
- Lack of willingness on the part of local farmers to change and adopt new farming practices instead of shifting cultivation involving slashing and burning;
- Use of arable land for other purposes such as mining;

- Lack of promotion of crops for uses other than as food including medicines, dyes and ornaments;
- Land hunger due to poor land management and land tenure; and,
- Loss of plant and genetic resources in research institutions due to the war ;

Strategies:

(i) Adopt a Government policy that promotes agricultural systems and practices that enhance agricultural biodiversity;

(ii) Promote the production of other grain and foodstuffs along with rice;

(iii) Raise awareness among local farmers to adopt agricultural practices that could minimize loss of biodiversity;

(iv) Control mining by enforcing the present policies and regulations;

(v) Promote research into production of crops for other purposes other than just as food;

(vi) Support and strengthen research institutions to carry out research and recover genetic resources lost through the war;

(vii) Train and provide logistics for more extension work; and,

(viii) Promote Agroforestry techniques as an efficient land use practice.

1.4 Agricultural Biodiversity (Livestock)

Issues and Gaps:

- Loss of livestock due to the war;
- Inadequate support services in the veterinary services;

- Poor animal husbandry practices; and.
- Over-grazing

Strategies:

(i) Restocking of animals with improved breeds;

(ii) Promote research into production of indigenous animal genetic resources;

(iii) Enhance and promote appropriate animal husbandry practices;

(iv) Promote and enhance support veterinary services among the farmers; and,

(v) Encourage farmers to diversity their production towards non-indigenous animal genetic resources and encourage agrosilvo pastoral system in range management.

1.5 Land Resources

Issues and Gaps:

- Lack of a comprehensive up-to-date land use policy and legislation; need to revise the land tenure system;
- Lack of sufficient knowledge of the nature and extent of land degradation; very little co-ordinated research;
- Poorly co-ordinated activities related to land use including, urbanization, transportation, mining, agriculture and waste disposal, and,
- Inadequate resources and logistic support for land use planning and monitoring.

Strategies:

(i) Review of the land use policy and legislation taking into consideration the land tenure system;

(ii) Strengthen the human and institutional capacity of those agencies involved in land use management to promote those practices that promote biodiversity;

(iii) Undertake measures to control all illegal activities promoting biodiversity loss;

(iv) Promote and encourage an integrated approach to the use of land nationwide;and,

(v) Optimise landuse by categorizing land according to productive capacity of the land.

2. Aquatic Biodiversity

2.1. Inland Water Ecosystems

Issues and Gaps:

- Lack of specific policy and institutional framework for the management of inland water ecosystems;
- Changes in water quality and volume due to activities including mining, irrigation, waste disposal and hydroelectric power generation;
- Over-exploitation of wetland resources;
- Over-lapping and conflicting mandates among agencies responsible for the management of inland water ecosystems;

- Population pressure due to the war; and,
- Inadequate financial support to agencies (government and NGOs) for inland water ecosystem management.

Strategies:

(i) Formulation of national policy and legislation on inland water ecosystems management that focuses on an integrated approach;

(ii) Legislature and Control on the exploitation of wetland resources;

(iii) Promote community- driven sustainable use of wetland and inland water ecosystems resources;

(iv) Promote support and enhance the ongoing rehabilitation and resettlement programmes for displaced populations; and,

(v) Solicit financial support for agencies involved in the management of inland water ecosystems including research.

2.2 Coastal and Marine Biodiversity, Including Fisheries.

Issues and gaps:

- Lack of up-to-date information on the status and trends on the biodiversity of the coastal and marine biotopes;
- Degradation and fragmentation of the coastal and marine environment through coastal infrastructural development;
- Loss of seabed integrity due to activities such as fishing, sand mining, oil exploitation and agriculture;

- Over-exploitation of commercial species especially fishes through increasing pressure and poor fishing practices;
- Uncontrolled introduction of pollutants, (solid waste, sewage, oils, chemicals)into the coastal environment;
- Lack of integrated approach to the management of coastal and marine areas;
- Lack of sufficient support to marine and coastal protected areas; and,
- Lack of an effective monitoring control and enforcement mechanisms against marine transgressions.

Strategies:

(i) Conduct research into the status of biodiversity in the major coastal and marine biotopes;

(ii) Promote an integrated approach to the management of the marine and coastal ecosystems;

(iii) Adopt and implement the FAO code of Conduct for Responsible Fishing;

(iv) Enhance the enactment of the proposed Marine Pollution Act;

(v) Promote and support the establishment of an effective Monitoring Control and Surveillance system for EEZ and IEZ; and,

(vi) Promote and support the implementation of the management of the existing and proposed conservation areas.

C. SUMMARY OF GENERAL MEASURES (CROSS-CUTTING STRATEGIES)

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

1. Policy, Legislative and Institutional Measures

Issues and Gaps:

- Lack of up-to-date policy and legislature addressing biological diversity;
- Lack of manpower, infrastructure and other support facilities for the enhancement of biodiversity programmes;
- The rapid urbanization, reconstruction and development programmes
- Lack of guidelines, for biodiversity conservation;
- Lack of policy and legislation on a coordination mechanism for biodiversity utilization and conservation; and,
- Inadequate National and International Technical and Financial Support for biodiversity programmes.

Strategies:

(i) Review and enact policy and legislation that enhances biodiversity strategies;

(ii) Enhance human and institutional capacity for biodiversity conservation activities;

(iii) Incorporation of specific guidelines and regulations into those programmes involving urbanization, reconstruction and development and undertake EIA's prior to any project implementation.

(iv) Support and promote the setting up of a mechanism and institutional framework for co-ordination among agencies on matters related to biodiversity; and,

(v) Advocacy and support for adequate National and International Technical and financial support for programmes related to biodiversity conservation.

2. Capacity Building:

Issues and Gaps:

- Lack of adequately trained personnel staff especially scientists to undertake biodiversity programmes;
- Lack of sufficient financial resources;
- Lack of adequate support facilities, such as libraries, laboratories and equipments; and,
- Lack of capacity to overcome research problems (taxonomy, ecological complexity)

Strategies:

(i) Enhance the human resources capacity through appropriate training for biodiversity management;

(ii) Establish and strengthen support facilities for biodiversity management; and,

(iii) Strengthen the financial resources capacity of both Government and Private Sector involved with sustainable use and conservation of biodiversity.

3. Public Participation

Issues and Gaps:

- Lack of sufficient involvement of the civil society especially the youths in the management of biodiversity;
- Lack of adequate 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 conservation.

Strategies:

(i) Promote and enhance civil society involvement in biodiversity activities, and provide financial support to youth programmes that enhance biodiversity conservation;

(ii) Adopt participatory approaches to conservation at all levels including village management committees; and,

(iii) Establish a clear policy and legislative framework for civil society participation in all biodiversity activities.

4. Biodiversity Planning

Issues and Gaps:

- Lack of comprehensive biodiversity planning in Sierra Leone;
- Lack of specific provisions for planning at sectoral levels; and,

- The National Environmental Protection Act (NEPA) is fairly general and selective with no particular emphasis on environmental planning.

Strategies:

(i) Strengthen and equip the established Biodiversity Planning Unit within the MOAFF;

(ii) Incorporate biodiversity planning into sectoral policies; and,

(iii) Adopt a participatory approach to biodiversity planning and decision making at all levels.

5. 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.

Strategies:

(i) Strengthen existing NEPA and regulations to include monitoring of various components of biodiversity over time;

(ii) Promote and enhance studies on the species diversity, status and trends of biodiversity in various ecologies;

(iii) Provide guidelines for the identification and monitoring of various components of biodiversity;

(iv) Develop and implement a biodiversity monitoring programme; and,

(v) Establish data bases for biodiversity and link them to the clearing house mechanism for information to be disseminated worldwide.

6. In-Situ Conservation (Protected Areas)

Issues and Gaps:

- Lack of up-to-date policy and legislative framework on protected Areas;
- Lack of unified guidelines in various sectoral institutions for management of PAs;
- Weak information base on PAS some of which may no longer exist;
- Lack of training and insufficient manpower capacity to manage PAs; and,
- Lack of sufficient information on the impact of the war on PAs;

Strategies:

(i) Review and update existing sectoral policies and legislation relating PAs;

(ii) Issue unified guidelines for the management of PAs;

(iii) Strategically reasses the status of existing and proposed PAs in post war situation;

(iv) Enhance training and manpower capacity to manage PAs; and,

(v) Enforce appropriate regulations relating to management of PAs

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 protected areas;
- Lack of adequate scientific knowledge of the ecology of the species in the various ecologies in areas outside PAs;
- Lack of management plans of the ecologies outside the PAs; and,.
- Ineffective law enforcement outside protected areas due to land tenure.

Strategies:

(i) Review and incorporate into sectoral policies and laws biodiversity management of

ecologies outside PAs,

(ii) Identify and assess the status of the species outside PAs,

(iii) Develop and implement guidelines for the sustainable use of natural resources outside PAs; and,

(iv) Promote the participation of local communities NGOs and private sector in the areas outside the PAs.

Ecological Restoration and Species Recovery

Issues and Gaps:

- Lack of knowledge of the provisions of Article 8(f) of the CBD relating to the ecological restoration and species recovery;
- Lack of knowledge and non compliance with the regulation of the NEPA on rehabilitation of ecosystems after the implementation of projects requiring substantial changes in natural environment;
- Inadequate manpower capacity and enforcement mechanisms for existing regulations;
- Lack of community based programmes for the restoration of ecosystems; and,
- Lack of species recovery programmes nationwide.

Strategies:

(i) Identify and demarcate critical ecosystems under threat;

(ii) Review and update sectoral policies and laws in line with the provisions of Article 8(f) of the CBD;

(iii) Promote manpower development and the enforcement of the existing regulations on ecosystem restoration and species recovery;

(iv) Develop and implement species recovery programmes especially for endangered species; and,

(v) Promote the active participation of the local communities in ecological restoration and species recovery work.

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.
- Too much emphasis on alien or exotic species in afforestation programmes in Sierra Leone.

Strategies:

(i) Promote scientific investigations into the types, origin and potential impacts of alien species on native biodiversity;

(ii) Review and strengthen existing policies and legislation on alien species;

(iii) Develop and promote programmes for monitoring, control and surveillance of alien species;

(iv) Enhance public education and awareness about the impacts of alien species;

(v) Promote the use of indigenous species in restoration work; and,

(vi) Forestry Division to limit the use of invasive alien species like *Acacia Magnum*, *Buceana* etc. in reforestation programmes.

7. Ex-situ Conservation

Issues and Gaps:

- Ex-situ conservation activities are confined to educational and research institution;
- Ex-situ facilities were adversely affected or destroyed during the war;
- Weak institutional framework for the establishment of ex-situ conservation facilities such as gardens, aquaria and herbal gardens; and,
- Lack of comprehensive sectoral policies and laws on ex-situ conservations.

Strategies:

(i) Develop the national capacity for ex-situ conservation by rehabilitating existing facilities and establishing new ones;

(ii) Strengthen educational and research institutions to further ex-situ activities;

(iii) Incoperation of ex-situ conservation measures into sectoral policies and laws; and,

(iv) Promote private sector initiatives and participation in ex-situ conservation activities.

8. Sustainable Use of Biodiversity Components.

Issues and Gaps:

- Lack of policy and legislative guidelines in some sectors on sustainable exploitation methodologies for biological resources;

- Internally Displaced Populations (IDPs) 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,

- Lack of adequate enforcement mechanisms for existing sectoral policies and regulations relating to sustainable exploitation of biological resources.

Strategies:

(i) Review and update sectoral policies and legislative guidelines on sustainable exploitation and use of biological resources;

(ii) Resettle the IDPs to prevent overexploitation of biological resources from sources such as forestry, wildlife, agriculture and fisheries;

(iii) Promote the use of appropriate technologies in the harvesting of biological resources;

(iv) Promote and encourage measures that reduce post harvest loses significantly in all sectors;

(v) Promote measures that encourage modest consumption;

(vi) Strengthen and upgrade existing enforcement mechanism for sectoral policies and regulations on sustainable use of biodiversity components;

(vii) Undertake public education programmes on sustainable use;

(viii) Encourage national surveys to determine consumption patterns and hence prescribe allowable cutons (i.e. balance supply and demand); and,

(ix) Promote and support customary and traditional resource use patterns that promote sustainable use of biodiversity.

9. Incentive Measures

Issues and Gaps:

- There is no explicit policy or legislative framework on incentive measures for the conservation and sustainable use of biological diversity in Sierra Leone;
- Certain sectoral policies and legislations lay emphasis on incentive for ecosystem restoration and biodiversity conservation;
- Present incentives in sectoral policies are for programmes which promote overexploitation of resources in the drive to meet target performance levels; and,
- NGOs promote incentive measures in a rather uncontrolled manner.

Strategies:

(i) Review the existing NEPA and regulations to incorporate incentive measures for the conservation and sustainable use of biodiversity;

(ii) Review and update sectoral policies to include incentive measures for programmes for conservation and sustainable use of biodiversity;

(iii) Develop a national programme on incentives to promote the design and implementation of new target oriented incentive measures to address specific threats and underlying causes of biodiversity loss;

(iv) Promote and co-ordinate the private sector initiatives to include incentive measures in conservation and biodiversity programmes; and,

(v) Provide incentives to Forest Managers that maintain or enforce existing forest boundaries in reserves.

10. Research and Training

Issues and Gaps:

- Research into biodiversity related areas has been carried out largely 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 ongoing 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.

Strategies

(i) Identify and undertake studies on all aspects of biodiversity in all the major ecosystem categories;

(ii) Identify research priorities for the successful implementation of programmes for conservation and sustainable use of biodiversity;

(iii) Carry out training needs assessment for professionals and extension staff in all the sectors responsible for biodiversity conservation; and,

(iv) Strengthen the capacity of existing research institutions to train the required Personnel and to conduct research on all aspects of biodiversity conservation.

11. 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 are rudimentary and confined to major cities where environmental disasters have been obvious in recent times;
- Environmental programmes for inclusion into basic education curricula are fairly recent and do not explicity stress biodiversity; and ,
- Various sectoral legislations make no specific provisions for environmental education.

Strategies:

(i) Promote and implement awareness raising programmes for opinion leaders at all levels of society including civil society, NGOs, funding agencies, the media and Government officials;

(ii) Develop and implement comprehensive public education and awareness programmes and campaigns on biodiversity nationwide in post war Sierra Leone;

(iii) Promote the incorporation of awareness raising and environmental programmes for biodiversity into sectoral policies and legislative frameworks;

(iv) Promote the integration of environmental education, including biodiversity into basic education and tertiary education curricula; and,

(v) Promote and encourage the introduction of non-formal approaches to environmental education for the majority of the rural population.

12. Impact Assessment and Minimising Adverse Impacts

Issues and Gaps:

- There is an increase in activities that impact negatively on the environment due to needs for reconstruction, rehabilitation and economic development in postwar Sierra Leone;
- Large scale projects in various sectors which significantly affect biodiversity are ongoing or planned including the mining (kimberlite, bauxite, rutile, sand, offshore oil), agriculture, hydroelectricity, generation, waste disposal, logging and industrial fishing;
- Information on the recently elaborated EIA guidelines are yet to receive public attention nationwide; and,
- Lack of an effective monitoring and enforcement mechanism for all regulations under the newly published EIA guidelines.

Strategies:

(i) Review and develop a more comprehensive list of categories of activities covered by the EIA guidelines;

(ii) Ensure and facilitate the active participation of stakeholders in the impact assessment processes, including; NGOs, company representatives, government agencies and local communities; and,

(iii) To promote and strengthen the effective monitoring and enforcement mechanisms of the existing regulations under the EIA guidelines especially for large-scale programmes.

13. Sharing of Benefits Arising from the use of Genetic Resources and Indigenous Knowledge.

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 exist in the country;
- Sectoral legal provisions regulating access to genetic resources are outdated; and
- Lack of explicit provisions in either the NEP or NEPA (2002) to regulate access to genetic resources and the sharing of benefits.

Strategies:

(i) Promote the introduction of a comprehensive legislative framework for the regulation of access to genetic resources and sharing of benefits from the use of those resources;

(ii) Review and update existing sectoral legal provisions in line with the proposed comprehensive framework on the access to genetic resources and the sharing of benefits;

(iii) Carry out awareness raising campaigns to sensitize the public on the regulation of access to genetic resources and sharing of benefits;

(iii) Promote and enhance the amendment of the National Environmental Protection Act (2002) to address issues of access, benefit sharing and intellectual property Right;

(iv) Promote the establishment of the institutional framework with the relevant capacity to regulate access to genetic resources and the sharing of benefits; and

(v) Promote private sector participation and local entrepreneurship in the regulation of genetic resources and sharing of benefits from the use of biological resources.

14. Indigenous Knowledge and Intellectual Property Rights

Issues and Gaps:

- Lack of adequate information in indigenous knowledge and practices in the conservation and sustainable use 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; and

- Lack of general awareness among local communities on the intellectual property rights and rewards

Strategies:

(i) Undertake some comprehensive studies on indigenous knowledge and practices among local communities for the conservation and sustainable use of biodiversity;

(ii) Review and update existing legislation on intellectual property rights to

Internationally acceptable standards in the conservation and sustainable use of biodiversity;

(iii) Promote public awareness about intellectual property rights and rewards in

conservation and sustainable use of biodiversity; and

(iv) Promote the customary use of biodiversity traditional resources management systems and indigenous knowledge of local communities.

15. Access to Technology and Handling of Biotechnology

Issues and Gaps:

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

Strategies:

(i) Assess the legal requirements for the transfer of technologies to benefiting country;

(ii) Promote and ensure the establishment of a legal framework for the regulation of biotechnology;

(iii) Review and update existing sectoral patent laws of Sierra Leone; and,

(iv) Identify and strengthen the capacity of existing institutions for biotechnology risk assessment including introduction of genetically modified living organisms.

16. Information Exchange and Technical/Scientific Co-operation

Issues and Gaps:

- Sierra Leone as a contracting party needs to comply with the necessary provisions of Article 17 and 18 of the CBD on exchange of technical and scientific information;
- Lack of specific provisions in sectoral laws on the exchange of information on biodiversity conservation and its sustainable use;
- Lack of a centralized agencies with a mandate and capacity for information gathering and decimination at national and international levels; and,
- Lack of a clear government policy for the facilitation of exchange of technical and scientific information in the fields of biodiversity.

Strategies:

(i) Assess the legal and capacity needs of Sierra Leone for compliance with the requirements of relevant provisions of Articles 17 and 18 of the CBD;

(ii) Develop and implement a clear policy and legal framework for the facilitation of exchange of technical and scientific information both nationally and internationally;

(iii) Review and update sectoral laws to include mechanisms for the ex-change of information on biodiversity and its sustainable use; and,

(iv) Establish a clearing house mechanism to facilitate exchange of technical and scientific information on biodiversity both Nationally and Internationally.

17. Relationship between the 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 in line Ministries and Agencies;
- Very little co-ordination and often weak linkages exist between implementing bodies of the national obligations under the different conventions; and,
- Programmes are often duplicated and implemented by different agencies due to poor coordination.

Strategies:

(i) Promote and enhance the establishment of a coordinating body or agency for the implementation of programmes under the different conventions by line ministries and agencies;

(ii) Encourage the establishment of steering committees for the joint identification, planning implementation and monitoring of the programmes under the different conventions, and,

(iii) Ratify all relevant biodiversity related conventions to complement the CBD to promote the conservation and sustainable use of biodiversity.

18. 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 projects requiring World Bank funding;

- Sectoral budgetary allocations by the GOSL for biodiversity conservation activities is grossly inadequate;

- Most NGOs involved in biodiversity work face financial constraints as the most serious impediment;

Strategies:

(i) Promote an increase in sectoral budgetary allocation from GOSL for biodiversity conservation;

(ii) To promote activities and projects by providing financial support for biodiversity work;

(iii) To develop a legislative framework incorporating user fees (licences, royalties) for biodiversity exploitation and use;

(iv) To promote monitoring, control and surveillance schemes involving penalties for biodiversity transgressions; and

(v) To foster donor support through Private foundations and NGOs for biodiversity activities.

V. COLLABORATION AND PARTNERSHIP

Under the guidance of the co-ordinator of the NBSAP, the task force and the steering committee, a national workshop was held between 10 September and 13 September, 2002 to consider the results of the stocktaking reports prepared by the National Consultants on Biodiversity in Sierra Leone.

After the first National Workshop a total of 6 provincial workshops in the 4 Provincial regions (Southern, Eastern Northern and western) were held.

Recognising that 70 – 80% of the rural population is dependent on the biodiversity resources for their livelihood, a strategic action plan for biodiversity should therefore be strongly participatory geared towards the total involvement of all sectors of society, so that in the final analysis the diverse views of all stakeholders can be garnered towards ensuring sustainable conservation and utilization of biological resources.

The number of participants in the provincial workshops was dictated to a large extent by budgetry constraints and the summary is presented below:

Region	**Town**	**Date**	**No. of Participants**
Southern	Bo	7 – 8 Nov. 2002	100
Eastern	Kenema	15 – 16 Nov. 2002	120
Southern	Moyamba	18 – Nov. 2002	80
Northern	Makeni	25 – 27 Dec. 2002	100
Northern	Port Loko	3 – 4 Dec. 2002	80
Western	Waterloo	18 Dec. 2002	100

The workshops adopted a participatory approach and the participants were drawn from a wide range of professions including traditional rulers, traders, herders, herbalists, fishermen, woodcutters, hunters farmers and students.

The participants were divided into 5 groups with each focusing on the following specific areas; Agriculture, Forestry, Wildlife, Fisheries and Marine Resources and the Sharing of Benefits. Each group was chaired by a facilitator skilled in participatory rural appraisal techniques. The meetings were held in the lingua franca (Krio) and sometimes in the local dialects. The participants held fruitful discussions on all topics presented as they relate to their respective localities.

They compared the status of the resources at present with what existed 50 – 80 years ago. They determined whether the status of biodiversity has improved or worsened and the factor responsible for the change.

Having identified the various factors, participants then recommended strategies and actions which range from cross cutting issues including policy and reforms practical field actions.

There are also as many as 16 programmes/projects involved in some aspects of the biodiversity work in Sierra Leone. There are some 56 registered NGOs involved or related to biodiversity. The projects and programmes depend on donor funding and their contribution towards the NBSAP has been very much appreciated.

Donor commitment to the NBSAP will be sought at a donor round table conference, where most of Sierra Leone's traditional donors will be requested to support the implementation of the various priority projects in the NBSAP.

VI. THE ACTION PLAN

A. INTRODUCTION

The action plan proposed in the Sierra Leone Biodiversity Strategy and Action Plan comprises a series of measures and mechanisms intended to conserve and promote the sustainable use of the different components of the country's biodiversity. The actions proposed cover several key thematic areas under: terrestrial biodiversity, inland water ecosystems, forest biodiversity, marine and coastal biodiversity and agricultural biodiversity. In addition, actions are also proposed for key cross cutting issues affecting the sustainable utilization of biodiversity, including: policy, legislation and institutional review, capacity building, identification and monitoring, sustainable use, incentive measures, research and training, public education and awareness, regulation of access to genetic resources, protection of indigenous knowledge and intellectual property rights of local communities, technology transfer and handling of biotechnology and exchange of information and technical cooperation.

The actions proposed in this plan are diverse. The time frame that will ensure the maintenance of biodiversity is estimated to be between 5-10 years if the measures proposed are undertaken. Some of the actions proposed will either serve to protect, restore or lead to the sustainable utilization of biodiversity. Other actions will focus on assessments and research, the provision of policy and institutional framework, etc. Below, each major theme and cross cutting sub-components are summarized, including actors and lead agencies needed for implementation, financial cost and timeframe needed for successful implementation.

B. THEMATIC ACTION PLANS

1. Terrestrial Biodiversity

1.1 Parks and Wildlife Management

Actions Proposed

- Review existing literature and documents relating to the flora and fauna of Sierra Leone;
- Carry out an assessment of herbaria and museum collections and produce a list of endemic species;
- Verify biodiversity information collected on the ground by conducting field assessments;
- Train personnel (para-taxonomists, technicians, etc) to carry out biodiversity assessment;

- Reclassify, gazette and establish a system of protected areas to include national parks, wildlife sanctuaries, strict nature reserves, etc, in representative ecosystems and ensure their proper management;
- Conserve all vulnerable, threatened and endangered species in the different ecosystems and protected areas;
- Ensure the proper management of forest reserves under logging to protect biodiversity against illegal settlements, forest clearance and hunting of wildlife;
- Identify the current status of all existing protected areas in terms of current manpower needs, scientific information and levels of threats facing them;
- Increase funding for protected areas commensurate with the size of the area, manpower needs and logistics needed to effectively control illegal logging, hunting and trapping of wildlife;
- Undertake a national census of all large mammals (e.g., chimpanzees and elephants) as a matter of urgency;
- Control the trade in bushmeat by identifying species threatened by the trade, introduction of a moratorium and the provision of alternatives;
- Review the 1972 Wildlife Conservation Act and pay attention to the status of species regarded as vulnerable, threatened or endangered;
- Elevate the status of the Wildlife Conservation Branch to a Wildlife Division and provide support services to carry out its new mandate;
- Encourage the active participation of NGOs in the management of protected areas;
- Encourage co-management of protected area resources and seek to involve important local institutions with adequate gender balance;
- Initiate and develop active research programs in all protected areas for regular and basic ecological monitoring of flora, fauna and their habitats;
- Advocate for an increase in the numbers and size of protected areas;
- Develop and implement management plans for all protected areas;
- Develop action plans for the conservation of species listed as habitat specifics, threatened and endangered;
- Develop infrastructure within protected areas for research, tourism and local communities;
- Carry out training needs assessments;
- Develop a training program for biodiversity conservation and management;
- Organize training courses for national parks and protected area managers as well as law enforcement officers;
- Establish and equip a biodiversity coordinating unit under the Ministry of Agriculture, Forestry and Food Security to oversee the implementation of the NBSAP;
- Map/Demarcate the location and area extent of sacred groves, natural monuments and heritage sites;
- Conduct an inventory of the flora and fauna of sacred groves;
- Advocate for a national policy for the conservation of sacred groves, natural monuments and heritage sites;

- Develop educational and awareness raising programs to improve on the negative attitudes of people towards protected areas;
- Conduct a review of the national protected area system;
- Encourage, support and provide incentives for the establishment of private protected areas;
- Conduct an assessment of the present and future needs of the current protected areas;
- Encourage broader stakeholder participation in the development and implementation of management plans for protected areas;
- Enhance the scientific and socio-economic value of protected areas to benefit adjacent communities;
- Encourage and promote land zoning outside of protected areas through financial incentives for biodiversity conservation on private and adjacent lands;
- Support the habitat restoration and rehabilitation of degraded lands in and around protected areas;
- Promote a landscape approach to protected area and species conservation;
- Support the establishment of botanic gardens as sites for wild plant genetic resource conservation;

Timeframe: 2004-2009

Actors: WCB, FD, University, NGOs

Estimated Cost: US$35 Million

1.2 Forest Biodiversity

Actions Proposed

- Assess the underlying causes of forest loss from an interdisciplinary perspective;
- Carry out proper management of logged out areas to ensure maintenance of biodiversity;
- Develop and implement alternatives to slash-and-burn agriculture in the forest zones;
- Encourage the sustainable exploitation of forests and the maintenance of important ecosystem services;
- Seek the involvement of local communities in the management and sustainable utilization of forest resources;
- Provide incentives and benefits to communities engaging in sustainable management of forest resources;
- Support and encourage sustainable forestry programs that protect biodiversity;

- Regulate the introduction and spread of exotic and overabundant species in forested areas;
- Encourage traditional practices and knowledge that are beneficial to the sustainable management and exploitation of forest biodiversity;
- Encourage and support ecosystem approach to forest management both at the national and local levels;
- Develop and implement guidelines that reflect the scientific, socio-economic and cultural benefits of forests to all;
- Promote the sustainable utilization of the existing forest reserves through proper planning and management;
- Analyze the representation and adequacy of existing forest areas for biodiversity conservation;
- Encourage the rehabilitation of degraded and deforested areas especially in mountainous areas;
- Develop broad valuation methods for the multiplicity of benefits offered by forest biodiversity;
- Develop, implement and improve on indicators/criteria for forest biodiversity exploitation and management;
- Seek the involvement of women and other key stakeholders in multiple use forestry programs;
- Introduce tax incentives/breaks on imported forest products to reduce threats on our national forests;
- Train an adequate number of individuals to engage in the assessment and valuation of forest biodiversity;
- Train forest tree-spotters;
- Provide subsidies and encourage the development of alternative energy sources to firewood/charcoal such as solar, gas, hydro- and electricity;
- Protect montane ecosystems and mountain water-shed areas from farming, grazing and logging activities;
- Support and encourage the establishment of forest plantations in degraded areas to supply timber and fuelwood needs;
- Analyze the demand and market structure for fuelwood in all urban areas;
- Develop and implement fuelwood projects;
- Encourage and support forest patrol officers at the national and community level;
- Improve and adopt stringent licensing systems for the exploitation of forest resources;
- Undertake stock surveys of all natural forests prior to exploitation so as to determine allowable cuts;
- Ban/restrict the use of power chain saws by unlicensed loggers;
- Undertake surveys of NTFPs and their uses to local communities;
- Limit the spread of forest fires;
- Encourage the afforestation of both the Northern Savana zones and the Mangroves in the Southwest of the country;
- Promote silvicultural techniques that encourage natural regeneration of native species;

- Promote incentive packages to communities and forest officers that maintain or enlarge the boundaries of the forest estate;

Timeframe: 2004-2008

Actors: FD, WCB, University, NGOs, Local Communities, Local Government

Estimated Cost: US$6 Million

1.3 Agricultural Biodiversity (Plant and Land Resources)

Actions Proposed

- Strengthen crop genetic resource conservation;
- Encourage and promote the use of medicinal plant cultivation and domestication in our farming system;
- Promote sustainable farming practices that lead to agricultural productivity, maintenance of soil fertility and the protection of biodiversity;
- Promote and support agro-forestry programs for farmers that are beneficial to biodiversity conservation;
- Review and assess the impact of the seed multiplication projects and recommend areas of improvement;
- Discourage farming practices in mountainous areas that lead to soil erosion and siltation;
- Document the types, distribution and abundance of pollinators of agricultural crops;
- Identify useful agricultural practices that maintain pollinator abundance and diversity;
- Encourage and promote soil and water conservation practices in both low lying and mountainous areas;
- Regulate the excessive use of agro-chemicals to prevent adverse effects on biodiversity;
- Encourage and promote sedentary and intensification of agriculture over slash-and-burn agriculture;
- Regulate agricultural expansion into natural and undisturbed ecosystems like forests, montane and wetlands;
- Control and regulate animal husbandry and livestock numbers in the agro-pastoral landscape;
- Conduct crop suitability assessments prior to the establishment of crop agricultural programs;
- Develop and promote agricultural practices that conserve wild relatives of agricultural crops;

- Promote and support crop breeding programs at national and traditional levels to increase agricultural productivity and variety;
- Assess the current distribution and levels of threats facing medicinal plants, ornamental plants and little known food crops;
- Promote research and breeding programs to enhance income opportunities and food security;
- Encourage and promote ex-situ conservation and propagation of medicinal plants, little known food crops and ornamental plants;
- Encourage and support research on threatened indigenous plant species;
- Assess and monitor the impact of agricultural activities and major development projects on the maintenance and promotion of agricultural biodiversity;
- Encourage and support in-situ conservation of wild genetic materials;
- Encourage the optimization of land use by marching crop species to site;
- Promote public awareness programs through various media outlets about maintaining agricultural biodiversity;
- Identify and implement appropriate incentive packages to encourage the sustainable use and management of agricultural biodiversity;
- Promote and support farmers association that collaborate with extension workers and researchers in the use of and maintenance of agricultural biodiversity;
- Promote the use of and maintenance of indigenous agricultural knowledge and practices that are beneficial to biodiversity;
- Incorporate and integrate indigenous systems in National Plans.
- Develop and implement legal framework for IPR local counterparts to all bio-prospecting and research institutes;
- Enhance/organize local communities to design agreeable equitable sharing framework;
- Conduct an environmental impact assessment of all bio-prospecting community exploitation activities.

Timeframe: 2004-2009

Actors: Agriculture, Research Institutions, University, Local communities, NGOs

Estimated Cost: US$9 Million

1.4 Agricultural Biodiversity (Livestocks)

Actions Proposed

- Strengthen livestock genetic resource conservation;
- Encourage and support local and commercial farmers to rear local breeds of livestock;

- Carry out a survey of market demands for preferred bushmeat products traded in urban areas;
- Strengthen and support programs (disease control, genetic improvement, nutrition, etc) that lead to better management of small ruminants and cattle;
- Encourage and promote the rearing of wild animals (especially mammals) that have market demand and frequently traded for bushmeat;
- Support and promote the domestication of wild species of birds such as guinea fowls, geese and ducks;
- Support and improve on traditional poultry production system;
- Promote the establishment of cottage industries in the production of dairy products like milk, cheese, cream, etc.;
- Support the establishment of bee keeping programs in rural communities;
- Support the establishment of ranches to encourage sedentary livestock rearing;
- Assess range conditions, carrying capacities of grazing sites and tolerance to repeated grazing by livestock;
- Develop management strategies and plans for all ranches and grazing sites to include fire control, soil stabilization, ground cover improvement, feeding techniques, rangeland improvement, livestock health, control of poisonous plants, fallow improvement, etc.;
- Encourage de-stocking when livestock numbers exceed carrying capacity;
- Promote the establishment of feed mills that rely on the utilization of locally produced grains and other agricultural products;
- Promote the establishment of watering sites or water holes for livestock;
- Encourage the formation of livestock associations by herders and farmers;
- Enhance and strengthen extension services for livestock owners and farmers;
- Promote public education and awareness on wildfire control, range management & improvement, stocking densities, range improvement, etc.

Timeframe: 2004-2009

Actors: Agriculture, Livestock Unit, Njala University College, Agriculture Institutions, NGOs

Estimated Cost: US$6 Million

2. Aquatic Biodiversity

2.1 Inland Water Ecosystems

Actions Proposed

- Carry out an inventory of all wetlands and apply appropriate conservation actions;
- Identify the causes of wetland loss and degradation;
- Map the distribution and abundance of threatened wetland vertebrates like Manatees, Crocodiles and Pigmy Hippos;
- Assess the level of human disturbance in and around the major watersheds;
- Prepare and implement an integrated management plan for key watershed areas;
- Examine the impact of alluvial diamond mining on wetlands in eastern and southern Sierra Leone;
- Involve all key stakeholders in the preparation and implementation of management plans and development projects that affect aquatic resources;
- Develop and adopt a national wetland policy;
- Examine the impact of agro-chemicals and other pollutants on wetland ecosystems;
- Support training programs and collaboration at institutional level to enhance the conservation and sustainable utilization of wetland resources;
- Disseminate information on the importance and potential risk of destroying wetlands;
- Encourage public participation in wetland resource use and management;
- Establish and implement legal, administrative and incentive packages for public participation in wetland biodiversity use and management;
- Promote efficient use of water in urban areas by curbing on pipe leakages and wastage;
- Mandate the use of EIA for all wetland related development projects with potential impact on biodiversity;

Timeframe: 2004-2008

Actors: FD, LWD, WBC, Agriculture, NGOs, University, Local Communties

Estimated Cost: US$3 Million

2.2 Marine and Coastal Biodiversity, Including Fisheries

Actions Proposed

- Support and equip the naval wing of the Sierra Leone Navy to make frequent patrols of territorial waters;
- Give adequate protection to coastal and marine habitats important for spawning and nursing of marine life;
- Use legal measures to control sea-based sources of marine pollution;
- Develop and support awareness programs for the sustainable exploitation of marine resources;
- Develop and promote policies to prevent physical alterations of marine habitats;
- Pursue the restoration of degraded marine areas;
- Support and strengthen research, monitoring of marine biodiversity;
- Identify and protect critical fishing grounds;
- Promote measures to prevent the introduction of alien and exotic species into marine and coastal habitats;
- Assess the impact on adjacent coastal communities on the loss of marine biodiversity;
- Undertake studies to identify potential marine sites for the establishment of marine protected areas;
- Develop management plans for marine protected areas;
- Develop and promote mariculture using native species;
- Seek the involvement of local communities and the private sector in mariculture;
- Undertake assessments and monitor the populations of threatened and endangered marine resources;
- Assess the impact of the potential release of aqua-culture species like Tilapia, etc., into freshwater ecosystems;
- Promote and enhance the positive aspects of mariculture on marine and coastal productivity;
- Study the ecology of important freshwater fisheries;
- Assess the socio-economic importance of marine and freshwater resources;
- Analyze freshwater fish consumption levels and species preferences;
- Determine MSY for commercially important species;
- Carry out a national review of government policies on fisheries management and development;
- Support educational and awareness raising programs in local communities about public policies and regulations on marine biodiversity;
- Support and legalize co-management systems for community fisheries management;
- Promote relevant indigenous knowledge and practices about fisheries and their management;
- Promote policies to facilitate the growth and functioning of artisanal fisheries
- Analyze gender issues and support women in the artisanal fishing industry;

- Promote and strengthen policies and regulations to prevent unsustainable exploitation of marine fisheries by trawlers;
- Ensure that yearly catches do not exceed the MSY;
- Organize training and information sharing workshops with stakeholders on sustainable fishing and management;
- Support collaborative activities at regional and international level in fisheries research, stock assessment and regulations;
- Provide human and technical resources for the marine and fisheries institutions to conduct research, surveillance, monitoring, information gathering and database management;
- Establish a "fisheries consultative committee" to promote a better understanding of fisheries management and policies, and to maintain a balance between the private and public sector;
- Support the establishment of a "mangrove management committee" to facilitate public education and encourage its proper management;
- Encourage and support locals to form fishing cooperatives;
- Raise awareness of the potential risk to the marine resources of channel fishing;
- Support and promote the conservation and rehabilitation of mangroves;
- Support research to assess and monitor fish stocks;
- Discourage the use of chemicals and dynamite in fishing;
- Discourage agricultural activities along the coastal areas;
- Encourage the development of eco-tourism along the beaches;
- Promote public awareness programs using various media outlets;
- Mandate and enforce the use of appropriate net sizes to prevent by-catch and wastage;

Timeframe: 2004-2008

Actors: Marine, IMBO, University, Private sector, Local communities, NGOs, WCB, FD

Estimated Cost: US$9 Million

C. CROSS-SECTORAL ACTION PLANS

1. Policy, Legislative and Institutional Review

Actions Proposed:

- Review and update the Wildlife Conservation Act of 1972 and the Forest Regulations of 1988 to aid in the implementation of various treaties involving biodiversity;
- Review and update national legislation on fisheries with emphasis on the protection of threatened and endangered species;
- Review and harmonize land tenure practices that support biodiversity conservation;
- Prepare, circulate, enact and adopt a National Biodiversity Policy and Act;
- Correct and remove market distortions that negatively impact and undervalue biodiversity;
- Encourage the sustainable exploitation of undervalued timber species;
- Regulate the destruction of coastal and marine ecosystems arising from sand mining, mangrove cutting, etc;
- Enact policies and regulate the uncontrolled discharge of raw sewage, industrial waste and household garbage into coastal/marine and wetland ecosystems;
- Strengthen and support family planning programs that reduce our population growth rate, and hence our over-exploitation of biodiversity;
- Promote and adopt policies that are sustainable in biodiversity exploitation;
- Encourage innovative programs that minimize our over-exploitation of biodiversity;
- Pursue policies that do not lead to over-dependence on monocultures;
- Promote sustainable logging practices;
- Assess marginal demand and consumption of NTFPs;
- Establish a technical team on biodiversity to advice on the integration of biodiversity concerns into sectoral and cross sectoral policies;
- Promote decentralization of natural resource management responsibilities with local authorities and communities;
- Implement and enforce policies that aid in the sustainable conservation of biodiversity;

Timeframe: 2004-2006

Actors: Government Agencies, NGOs, University, Local Authorities & Communities.

Estimated Cost: US$3 Million

2. Capacity Building

Actions Proposed:

- Support and conduct a training needs assessment for government agencies and local NGOs currently responsible for biodiversity management;
- Provide training programs for current professionals in fields critical to the conservation and sustainable use of biodiversity;
- Support networking among professionals in fields related to biodiversity;
- Support the training of para-taxonomists and tree spotters;
- Conduct institutional needs assessment of all institutions with interest and responsible for biodiversity;
- Provide financial and material support for institutions addressing biodiversity issues;
- Support and strengthen actions that establish self-financing mechanisms in institutions addressing biodiversity issues;
- Support the review of policies and regulations that prevent the active involvement of local NGOs in biodiversity conservation;
- Enhance the capacity of local NGOs in relevant skills through training workshops and seminars;
- Promote and support NGO access to relevant information held by government institutions;
- Establish a clearing house mechanism for sharing of information on biodiversity;

Timeframe: 2004-2007

Actors: FD, Environment, WCB, Marine, most Government Departments, University, NGOs, Local communities.

Estimated Cost: US$6 Million

3. Identification and Monitoring

Actions Proposed:

- Organize a workshop to ascertain national taxonomic priorities and the needs of the end-users of the information generated;
- Develop programs that focus on the re-training of a handful of professionals in taxonomy-related fields;
- Support the training of scientists in specialized fields like molecular systematics and bioinformatics;
- Collect and collate information on practicing taxonomists in the country;
- Inventory key taxonomic groups of plants, animals and micro-organisms;

- Conduct an inventory of rare, threatened and endangered wildlife species in the country;
- Conduct an inventory of fauna and flora of all protected areas in the country;
- Carry out ecological studies on all endangered and threatened species;
- Establish and support a fully functional Biodiversity Monitoring Unit in the Ministry of Agriculture, Forestry and Food Security;
- Conduct baseline surveys and inventories to determine the health and quality of key ecosystems;
- Support the use of GIS and other technology in monitoring change over time;
- Monitor the population and distribution of large and exploited mammal species in the country;
- Develop monitoring mechanisms for different threat levels to biodiversity in the different ecosystem types;
- Set up a database on the biodiversity of the country;
- Identify biodiversity data sources and institutional capacities for collection and managing biodiversity information;
- Undertake capacity building needs assessment of the various institutions dealing with plant and animal taxonomy (herbarium, arboretum, botanic reserves, museum, etc)

Timeframe: 2004-2009

Actors: FD, Environment, Marine, Agriculture, University, Local Communities, NGOs.

Estimated Cost: US$4.5 Million

4. Sustainable use of Biodiversity Components

Actions Proposed:

- Review current logging concessions to ensure future compliance with stipulated harvest levels, logging and hauling methods and forest regeneration;
- Promote the role of non-timber forest products (NTFPs) in sustainable forestry;
- Develop and promote timber certification programs for both state owned and private logging concessions;
- Develop criteria, guidelines and indicators for sustainable harvesting of NTFPs;
- Support and promote domestication of preferred bushmeat species;
- Support and promote the cultivation of medicinal plants;
- Establish MSY for frequently exploited marine and freshwater species;
- Strengthen regulatory measures to minimize over-exploitation and by-catch;
- Promote mariculture and aquaculture;
- Promote alternatives to slash-and-burn agriculture especially in the forest regions;

- Promote organic farming methods and reduce reliance on agro-chemicals;
- Study and implement carrying capacities and guidelines for visitors to our protected areas;
- Promote low-impact eco-tourism and architectural infrastructure in all protected areas;
- Promote the "no sale" of wildlife to tourists and visitors;
- Promote educational awareness programs about human impact on our biodiversity;
- Undertake inventories to determine yield controls;

Timeframe: 2004-2006

Actors: FD, Marine, Agriculture, NGOs, University, Local Communities

Estimated Cost: US$3.5 Million

5. Incentive Measures

Actions Proposed:

- Promote private sector investment in the sustainable exploitation of biodiversity;
- Promote co-management arrangements with local communities and private sector for secure and equitable benefit sharing in the management and sustainable exploitation of natural resources;
- Discourage unsustainable use of natural resources through the strengthening of existing laws, statutes and regulations;
- Promote the use of EIA prior to the conversion of natural areas into agro-pastoral lands;
- Promote policies that reduce the infrastructural development of mangroves, coastal areas and marine environment;
- Promote low-input agriculture over high input agriculture through policy review and reforms;
- Study the impact of macro-economic factors arising from international trade, structural adjustment programs, government privatization programs, etc on biological diversity;
- Develop and support measures for the implementation of incentive measures;
- Target specific threats to biodiversity by providing targeted incentive measures;
- Integrate both the economic and non-economic values of biodiversity into development plans and national accounting systems;
- Promote taxation for private sector businesses that depend on biodiversity;
- Provide tax breaks to businesses that promote programs to minimize their impact on biodiversity;

- Develop training programs for key planners, managers, NGOs and economists in the design and implementation of incentive measures;
- Develop compensation schemes for local communities whose access to protected areas has been curtailed;
- Modify and review policies that create market distortions thereby leading to increased loss of biodiversity;
- Encourage the payment of royalties to landowners and community groups

Timeframe:2004-2009

Actors: FD, Agriculture, most Government agencies, NGOs, Local Communities, Marine, University

Estimated Cost: UD$2 Million

6. Research and Training

Actions Proposed:

- Develop and implement policies on research and training;
- Assess the impact of different forestry practices on the conservation of biodiversity;
- Study the ecology (e.g. distribution, feeding, reproduction, migration, etc.) of rare, endemic, threatened and endangered species (both plants and animals);
- Conduct studies on the regeneration system of important timber and Non-timber forest products;
- Analyze the impact of different land uses (e.g., agriculture, urbanization, forest plantations, etc.,) on the maintenance of biodiversity;
- Determine the impact of alien/exotic species on local biodiversity;
- Determine the impact of pollution on freshwater and marine ecosystems;
- Assess the impact of mining on biodiversity;
- Study successional processes in mined out areas;
- Study the consumption of non-timber forest products and recommend sustainable levels of exploitation;
- Carry out research on the exploitation of sharks for the Asian fin soup market;
- Assess the impact of agro-chemicals on plant and animal life in the country;
- Promote agro-forestry trials as an efficient form of land-use;

Timeframe: 2004-2008

Actors: University, Research Institutions, FD, Marine, Agriculture, WCB, NGOs.

Estimated Cost: US$1.5 Million

7. Public Education and Awareness

Actions Proposed:

- Develop and promote a media campaign emphasizing the importance of biodiversity;
- Develop and integrate biodiversity conservation and sustainable use of natural resources in school curriculum;
- Provide support to local NGOs to engage in environmental awareness raising programs;
- Provide support for the production and dissemination of information materials on biodiversity through songs, theatrical performances, arts, etc;
- Ensure teacher training institutions and colleges develop and implement appropriate courses in biodiversity;
- Develop educational materials on endemic, rare, threatened and endangered species;
- Translate educational materials on endemic, rare, threatened and endangered species in key local languages;
- Produce and disseminate educational materials like posters, newsletters, brochures and leaflets, billboards, etc on biodiversity;
- Encourage the print and broadcast media to cover biodiversity issues;

Timeframe: 2004-2009

Actors: NGOs, Training Colleges, University, FD, Marine, Agriculture, Local communities.

Estimated Cost: US$2.5 Million

8. Access to Genetic Resources

Actions Proposed:

- Analyze existing policy, legislative and administrative measures on genetic resources and benefit sharing;
- Assess the strengths and weaknesses of institutions and individuals addressing issues surrounding genetic resources and benefit sharing;
- Conduct nation-wide awareness raising programs on the value of genetic resources, need for regulation, rights of individuals, institutions and communities harboring genetic resources and indigenous knowledge;
- Develop capacity of key individuals and officials through training on genetic resources and benefit sharing;

- Provide support for the development of entrepreneurial skills in bio-prospecting by in-country scientists and investors and local communities;
- Examine the impact on the status of genetic resources due to bio-prospecting;
- Develop a national policy measure to facilitate the equitable sharing of benefits arising from genetic resources;
- Develop policy measures to regulate the exploitation of genetic resources through the introduction of permits and regulatory procedures;

Timeframe: 2004-2009

Actors: Agriculture, Justice Department, FD, University, Local Government, NGOs, Local Communities, Marine, Tourism.

Estimated Cost: US$2.5 Million.

9. Indigenous Knowledge and Intellectual Property Rights

Actions Proposed:

- Document past and existing resource management practices and knowledge in local communities;
- Examine the level of incorporation of indigenous knowledge and practices in current management and decision making processes;
- Analyze existing laws and legislative policies that protect and promote indigenous knowledge and intellectual property, innovations and practices in local communities;
- Ensure the protection of indigenous knowledge and practices relevant to the conservation and sustainable use of biodiversity;
- Promote collaboration between relevant government institutions and local communities in the use and adoption of indigenous knowledge systems and practices;
- Develop a national policy measure to facilitate the equitable sharing of benefits from the use of indigenous knowledge in such areas as medicinal plants;
- Develop a national intellectual property rights system to safeguard the knowledge and innovations of local communities;

Timeframe: 2004-2007

Actors: Justice Department, Local Government, Local Communities, University, NGOs, FD, Marine, Agriculture.

Estimated Cost: US$1 Million

10. Access to Technology and Handling of Biotechnology

Actions Proposed:

- Assess and identify existing technologies relevant to the country;
- Promote the transfer of relevant technologies to Sierra Leone;
- Develop and enact patent laws to protect local inventions;
- Design and implement measures to safeguard against the harmful introductions of genetically modified organisms;
- Develop standards and early warning measures against harmful introductions of genetically modified organisms;
- Support awareness raising programs on bio-safety and the associated risks with the mistreatment of biotechnology;

Timeframe: 2004-2006

Actors: Education, Health, Agriculture, University, NGOs.

Estimated Cost: US$500,000

11. Information Exchange and Technical/Scientific Co-operation

Actions Proposed:

- Establish a National Biodiversity Database and Information Center to provide networking opportunities, repository of biodiversity information, and its dissemination (a clearing house mechanism);
- Provide training in the collection, organization, updating and communication of biodiversity information;
- Provide training to end-users to ensure the full utilization of the information collected and stored;
- Promote the development and implementation of joint initiatives with other countries on important biodiversity issues (e.g. trans-boundary protected areas for peace and co-operation);
- Encourage the exchange of experts and expertise with neighboring countries on biodiversity;
- Promote and support regional co-operation in biodiversity conservation that border on trade in endangered species or genetic resources;
- Support information exchange in remote and rural areas;
- Assess and identify existing technologies relevant to the country;

Timeframe: 2004-2006

Actors: Information, Education, NGOs, FD, Marine, Agriculture, WCB, University, Local Communities.

Estimated Cost: US$400,000

D. SCHEDULE OF IMPLEMENTATION

The National Biodiversity Strategy Action Plan (NBSAP) will be launched at the beginning of 2004, with a wider participation of the general public ranging from educational institutions to local communities will be sought through regular TV broadcasts and radio messages, seminars and workshops.

The initial implementing phase of the NBSAP will last for seven years (2004-2010), during which time the needed resources will be mobilized, institutional arrangements established, baseline studies conducted and policy reviews undertaken. It is during this period that the priority activities identified in the action plan will be undertaken. Details of the actions, outputs/signs, actors and timeframe for implementation are presented in Annex 2, and will serve to provide indicators as to whether progress is being made in a timely manner. A review of the NBSAP will commence in 2010, with deficiencies being corrected and new priorities identified with the view to updating the NBSAP.

E. THE BUDGET

The amount of financial commitment needed for successfully implementing the actions and activities proposed in the NBSAP is huge, and sustainable sources of funding would have to be identified to make it possible. It is hoped that government's commitment to biodiversity conservation will see increased budgetary allocations, with additional funding being sought from bilateral donors to Sierra Leone Government, private sector businesses, and fees and royalties from the potential exploitation of biodiversity. All the financial resources marshaled will be deposited into a National Biodiversity Trust Fund, with the accruing interest utilized for conservation related activities.

Below is a tentative budget required for the implementation of the NBSAP:

Item	Sub-Component	Estimated Cost (US$)
1.	Terrestrial Biodiversity (Wildlife)	35 Million
2.	Terrestrial Biodiversity (Inland waters)	3 Million
3.	Forest Biodiversity (Lowland, Montane and Savanna)	6 Million
4.	Marine and Coastal Biodiversity	9 Million
5.	Agricultural Biodiversity (Plants and Land)	9 Million
6.	Agricultural Biodiversity (Livestock)	6 Million
	Thematic Component Total	**68 Million**
1.	Policy, Legislative and Institutional Review	3 Million
2.	Capacity Building	6 Million
3.	Identification and Monitoring	4.5 Million
4.	Sustainable use of Biodiversity Components	3.5 Million
5.	Incentive Measures	2 Million
6.	Research and Training	1.5 Million
7.	Public Education and Awareness	2.5 Million
8.	Access to genetic resources and benefit sharing	2.5 Million
9.	Indigenous Knowledge and Intellectual Property Right	1 Million
10.	Access to Technology and Handling of Biotechnology	0.5 Million
11.	Information Exchange and Technical/Scientific Co-operation	0.4 Million
	Cross-Sectoral Component Total	**27.4 Million**
	Total NBSAP	**95 Million**

The NBSAP will implement a series of specific projects and programs undertaken by key institutions and agencies in the country. Lead agencies will be responsible for implementing specific projects covering a given set of strategies and action plans in the NBSAP. In Annex 2, 10 priority project profiles are presented, amounting to a total of $**.

F. MONITORING AND EVALUATION

The implementation of the proposed strategies and action plans will be the primary responsibility of the NBSAP Coordination Unit. The unit will be responsible for monitoring and reviewing progress on a regular basis with recommendations for improvement. Targets will be set with clearly defined indicators. Progress reports on a bi-annual basis will be produced and published and circulated to the general public, with the results made available in a report to the Conference of Parties to the CBD. Evaluation and review of the NBSAP will be done after five years.

VII. SHARING OF NATIONAL EXPERIENCE

The preparation of the NBSAP Action Plans benefited from a series of country reports prepared by national consultants. In addition, Biodiversity Action Plans completed for other countries were made use of extensively, and has served to enrich the action plans and strategies proposed here. In particular, the following documents were made use of for the Sierra Leone Biodiversity Strategy Action Plan:

i. Global Biodiversity Strategy (1992)

ii. Biodiversity Action Plan for Indonesia (1993)

iii. The Gambia National Biodiversity Strategy and Action Plan (1998)

iv. Canadian Biodiversity Strategy (1995)

v. Biodiversity in France: Action Program for fauna and flora (1997)

vi. National Report on Biological Diversity, Government of Netherlands (1996)

vii. The National Strategy for the Conservation of Australia's Biological Diversity (1996)

viii. Action Plan on Biological Diversity, Swedish Environment Protection Agency (1996).

Annex 1: NBSAP IMPLEMENTATION SCHEDULE

2.1 THEMATIC SECTORAL ACTION PLAN
2.1.1 Terestrial Biodiversity

a) Wildlife Sub-Component

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Review existing literature and documents relating to the flora of Sierra Leone.	A comprehensive knowledge of our biodiversity produced including Red Data List	The University of Sierra Leone, FD							
Review existing literature relating to animals in Sierra Leone	A comprehensive knowledge of our biodiversity produced including Red Data List	The University of Sierra Leone							
Assess Herbaria and Museum Collections.	A list of endemic species produced	The Unviersity of Sierra Leone, Forestry Division							
Verify information collected on the ground by conducting field assessment	Biodiversity information verified	Wildlife Conservation Branch, FD							
Train personnel to carry out above functions	Staff trained to carry out biodiversity assessment	Research Institutes							
Reclassify and gazette existing protected areas	Protected areas and national parks reclassified and documented	The University, GOSL, FD							
Advocate for increase in numbers and size of protected areas	Protected areas and national parks increased in size and area	GOSL, FD, The Unviersity, NGOs							

Develop management plans for all protected areas	Management plans developed for all protected areas	Forestry Division, Wildlife Conservation Branch, NUC							
Develop actions for the conservation of species	Species action plan developed	Research Institutes, FD							
Develop infrastructure within protected areas for research, tourism and the local community	Infrastructure developed	The University, Civil Society, Donor agencies							
Carry out training needs assessments	Gaps in knowledge, expertise and skills identified	The University of Sierra Leone							
Develop a training program for biodiversity conservation and management	A comprehensive training program for parks, protected areas, managers and law enforcement officers developed	The University of Sierra Leone, Polytechnics, FD							
Organize training courses for national parks and protected area managers as well as law enforcement officers	At least ten (10) trainers trained in protected area management	The University of Sierra Leone, Forestry and Wildlife Conservation Branch							
Establish and equip a biodiversity Coordinating Unit	Well-staffed and equipped coordinating unit established	Research Institutes and Government Ministries							
Integrate conservation education in educational institutions and local communities	Conservation education integrated in schools, curricular, development	NGOs, Educational Institutions							

Map the location and area extent of sacred groves and other sites	Sacred groves and other sites mapped and located	Secret Societies, The University of Sierra Leone							
Conduct an inventory of plants and animals of sacred groves	Plants and animal species of sacred groves inventoried	Chiefdom authorities, Government Ministries, The University of Sierra Leone							
Advocate at national level for a policy for the protection and conservation of sacred groves	National policy for sacred groves developed	Researchers, Chiefdom authorities							
Establish and equip a Biodiversity Coordinating Unit	A well-equipped and staffed unit in the Ministry of Agriculture, Forestry and Food Security established	Forestry Division, Wildlife Branch, University							
Encourage co-management of protected areas	Co-management implemented	Forestry, WCB, local communities							
Develop research programs in all protected areas	A comprehensive research program developed	Forestry, WCB, University							
Organize training courses for park managers and law enforcement	At least 60 park personnel and 30 law enforcement officers trained	WCB, NGOs, Police, Military, University							
Develop educational programs on protected areas									

Support and provide incentives for the development of private protected areas	At least one private protected area established	Forestry, WCB, NGOs, private sector, local communities							
Assess present and future needs of protected areas	At least 2 workshops held to identify the needs of PAs	Forestry, WCB, University, NGOs, local communities							
Seek broader stakeholder participation in implementation of management plans	All stakeholders consulted and consensus sought	All key stakeholders							
Encourage land zoning outside of protected areas	Land zoning done for at least 6 PAs	WCB, Forestry, NGOs, local communities, private sector							
Restore and rehabilitate degraded land outside of protected areas	Land outside 6 PAs restored and rehabilitated	Forestry, NGOs, local communities							
Promote landscape approach to protected area and species management	Landscape approach adopted for at least 2 PAs	All key stakeholders							
Support the establishment of botanic gardens	At least 2 botanic gardens established	University, private sector							

b) Forest Biodiversity Sub-Component

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Assess underlying causes of forest loss	Causal factors identified and remedial measures put in place	Forestry, NGOs, local communities							
Ensure proper management of logged areas	Guidelines for proper logging developed and implemented	Forestry, Local communities, private sector, NGOs							
Develop alternatives to slash-and-burn agriculture	Maintenance of soil fertility, increased crop yields	LWD, Agriculture, IAR, Rice Research							
Encourage sustainable exploitation of forests	Sustainable forestry practices put in place for all forest areas	Forestry, Local communities, NGOs							
Involve local communities in sustainable use and management of forests	At least 12 seminars and workshops held to seek involvement of local communities	Forestry, WCB, NGOs, Local communities							
Support sustainable forestry programs that protect biodiversity	At least 3 sustainable forestry programs developed and implemented	Forestry, local communities, NGOs							
Regulate the introduction and spread of exotic species	Guidelines and measures for controlling exotic species developed and implemented	University, forestry, WCB, private sector, local communities							

Encourage traditional knowledge and practices beneficial to biodiversity	Traditional knowledge and practices integrated in biodiversity conservation	Local communities, Forestry, WCB, NGOs							
Encourage and support ecosystem approach to forest management	Ecosystem approach incorporated in all forest management plans	Forestry, University, NGOs, local communities							
Develop and implement guidelines that reflect multiple benefits of forests	Clear guidelines developed for a range of benefits	Local communities, Forestry, NGOs							
Promote sustainable utilization of forests through proper planning and management	Sustainable utilization of all forest areas developed	Forestry, local communities, NGOs							
Analyze the representation and adequacy of existing forest areas for biodiversity conservation	Gap analysis of current forest reserves done	Forestry, NGOs, University							
Rehabilitate degraded and deforested mountain areas	At least 10 mountain areas restored	Forestry, NGOs, Local communities							
Develop valuation methods for multiplicity of forest biodiversity	Forest valuation methods developed	University, FD							
Develop, implement and improve on indicators/criteria for forest biodiversity exploitation and management	Gaps in existing initiatives identified	Forestry, WCB, NGOs							
Involve women and other key stakeholders in multiple use forestry programs	More women involved in forestry programs	Forestry, NGOs, women's group							
Provide tax incentives/breaks for imported forest products	Tax breaks provided for key products	Private sector, Forestry, NGOs							

Train an adequate number of individuals for assessment and valuation of biodiversity	At least 20 individuals trained	Forestry, University, WCB							
Provide subsidies and encourage alternative energy development	Alternative sources of energy promoted	NGOs, private sector, Forestry							
Support the establishment of forest plantations in degraded areas for firewood and timber	At least 6 plantations for timber established	Forestry, private sector, local communities							
Analyze market demand and structure for fuelwood in urban areas	Fuelwood demand in all urban areas established	University, FD							
Develop and implement fuelwood projects	At least 6 plantations for firewood established	Forestry, local communities, private sector, NGOs							
Reorient the role of forest officers to be facilitators for forest management rather than controllers	At least 30 forest officers retrained and deployed in collaborative forest management	Forestry, WCB, NGOs, University, local communities							
Improve and adopt stringent licensing systems for forest exploitation	New guidelines and licensing protocols developed and implemented	Forestry, university, NGOs							

Agricultural Biodiversity (Plant and Land Resources) Sub-Component

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Strengthen crop genetic resource conservation	Key food crops protected	University, Agriculture, IAR, Rice Research							
Promote medicinal plant cultivation and domestication in farming system	At least 2 medicinal plant cultivation programs initiated	University, IAR, herbalists							
Promote sustainable farming practices	Improved production and productivity	Agriculture, IAR, Njala University							
Review and assess the impact of the seed multiplication projects in the country	Gaps identified and corrective measures used	University, Agriculture							
Discourage farming practices on steep slopes	Soil erosion and siltation minimized	Agriculture, IAR							
Document the types, distribution and abundance of pollinators of agricultural crops	Important pollinators identified	University, Agriculture							
Identify useful agricultural practices that maintain pollinator diversity	Increased pollinator diversity	IAR, Agriculture, NUC							
Promote soil and water conservation practices	Enhanced soil fertility and water availability	LWD, NUC Agriculture							
Regulate excessive use of agro-chemicals	Careful use of fertilizers and pesticides	IAR, Agriculture, farmers							
Promote sedentary agriculture over slash-and-burn agriculture	At least 3 farm families practicing sedentary agriculture by 2009	Farmers, Agriculture, IAR							

Regulate agricultural expansion into natural and undisturbed ecosystems	Reduction in uncontrolled agricultural practices in forested areas	Farmers, Agriculture							
Conduct crop suitability assessment	Crop zoning data acquired	NUC, IAR, Agriculture							
Promote agricultural practices that conserve wild relatives of agricultural crops	Wild populations identified and protected	NGOs, Agriculture, National Herbarium							
Support crop breeding programs at national and traditional levels	Production of suitable crop varieties	IAR, Rice Research, University							
Assess threats facing medicinal plants, ornamentals and little known food crops	Threats identified and corrected	University, National Herbarium							
Encourage research on threatened indigenous plant species	Information on threatened conservation	University, NGOs, Forestry							
Assess impact of agricultural and development projects on maintenance and promotion of agricultural biodiversity	Institutionalized EIA program	Environment, Agriculture, University							
Encourage and support in-situ conservation of wild genetic materials	At least 3 in-situ conservation programs developed	University, NGOs							
Promote public awareness programs about maintaining agricultural biodiversity	Public awareness implemented	NGOs, Agriculture							
Identify and implement incentive packages for managing agricultural biodiversity	Incentive package developed	Agriculture, IAR, Rice Research, NGOs							

Promote and support farmer associations to collaborate with extension workers and scientists	At least 4 seminars and workshops on collaboration organized	NGOs, IAR, Rice Research, University, Agriculture							
Promote the use of indigenous agricultural knowledge and practices	Sustainable agricultural practices	Local communities, NGOs, Agriculture							

Agricultural Biodiversity (Livestock) Sub-Component

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Strengthen livestock genetic resource conservation									
Encourage and support local and commercial rearing of local livestock breeds	Increased local livestock production	Local communities, University, NGOs, Agriculture							
Survey market demands for bushmeat products traded in urban areas	Preferred species identified	University, NGOs							
Strengthen and support programs that lead to better management of small ruminants	Increased meat supply	University, private sector, NGOs, agriculture							
Encourage and promote the rearing of wild animals	Increased meat supply	University, NGOs, private sector, agriculture							
Support and promote the domestication of wild species of birds	Diverse sources of meat products	University, agriculture, private sector, NGOs							
Support and improve on traditional poultry production	Increased meat supply	University, private sector, local communities, agriculture, NGOs							

Promote the establishment of cottage industries for dairy products	At least 2 cottage industries established	Local communities, NGOs, Agriculture								
Support bee keeping programs in rural communities	Increased income possibilities	Local communities, NGOs, private sector								
Support the establishment of ranches for livestock rearing	Easy access to medical services	Private sector, Agriculture								
Assess range conditions, carrying capacities and range sites	Range management information established	Agriculture, University								
Develop management plans and strategies for all ranches and grazing sites	Management plan/strategy for ranches & grazing sites	Livestock, University								
Encourage de-stocking when livestock numbers exceed carrying capacity	Improved range condition	Livestock								
Promote the establishment of feed mills based on locally produced grains and inputs	Integrated livestock and crop production	Livestock, Agriculture, NGOs								
Promote the establishment of watering sites and holes for livestock	Livestock evenly dispersed	Livestock, private sector, local communities								
Encourage the formation of livestock associations by herders and farmers	Focused farmer associations	Local communities, private sector, Livestock								
Enhance and strengthen services for livestock owners and farmers	Effective extension services	Extension, NGOs, Agriculture								
Promote public education and awareness on wildfire, management, etc.	Effective participation by informed public	NGOs, Livestock								

Aquatic Biodiversity
a) Inland Water Ecosystems

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Carry out an inventory of all wetlands	Complete inventory of wetlands	University, WCB, NGOs, Forestry, Fisheries							
Identify causes of wetland loss and degradation	Threats and causes identified and measures put in place	Forestry, LWD, Agriculture, NGOs, local communities, Mineral resources							
Map the distribution and abundance of threatened wetland vertebrates	Distribution map and information produced	University, NGOs, WCB							
Assess the level of human disturbance around major watersheds	Better protection for watersheds	Forestry, private sector, para-statal							
Prepare and implement management plan for key watershed areas	Management plan developed for at least 3 Ramsar sites	NGOs, University, Forestry, Agriculture, LWD							
Examine the impact of alluvial diamond mining on wetlands	Data on the effect of diamond mining	University, Mineral Resources, NGOs							
Involve key stakeholders in preparation of management plans for aquatic resources	A comprehensive management plan developed	All key stake holders							

Develop a national wetland policy	Wetland policy implemented	Government, Agriculture, Forestry, Environment							
Examine the impact of agro-chemicals and pollutants on wetlands	Problem areas identified and corrected	Environment, Agriculture, Forestry, WCB							
Support training and collaborative programs at institutional level	Collaborative programs established	University, forestry, WCB							
Disseminate information on potential impact of wetland loss	Well informed public	NGOs, Forestry, WCB, LWD							
Encourage public participation in wetland resource use and management	Stakeholder involvement in the planning and management of at least 3 wetland sites	Public, Forestry, WCB, local communities							
Establish and implement administrative and incentive packages for public participation in wetland biodiversity management	Incentive packages and well-functioning administration	IPAM, Forestry, NGOs, local communities							
Promote efficient use of water in urban areas	Efficiency in water use	Guma Valley, public, NGOs							
Mandate the use of EIA for all wetland related development projects	EIA institutionalized	Environment, Forestry, Agriculture, NGOs							

Marine and Coastal Biodiversity, Including Fisheries

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Support and equip naval wing to make frequent patrols	Poaching minimized	Military, Fisheries							
Give adequate protection to coastal and marine habitats important for spawning and nursing of marine life	A network of spawning and nursery areas established	University, Marine, NGOs							
Use legal measures to control sea-based sources of marine pollution	Pollution minimized	Marine, NGOs, Environment							
Develop and support awareness programs for the sustainable exploitation of marine resources	A well enlightened public	NGOs, Marine, University							
Develop and promote policies to prevent physical alterations of marine habitats	Action plans for key marine habitats developed	Marine, Tourism, NGOs, Agriculture							
Restore degraded marine habitats	At least 2 sites restored and protected	Marine, Environment, NGOs							
Support and strengthen research and monitoring of marine biodiversity	Technical research capacity built	University, Marine							
Identify and protect critical fishing grounds	A network of protected fishing grounds	Marine, NGOs							
Prevent introduction of alien species into marine and coastal habitats	Deterrents put in place	Marine, NGOs							
Assess the impact of marine biodiversity loss on coastal communities	Sustainable programs developed	Marine, NGOs, Local Communities							

Identify sites for establishment of marine protected areas	Guidelines developed and sites selected	Marine, NGOs, WCB, University							
Develop management plans for marine protected areas	Management plan for marine PAs	Marine, NGOs, University, WCB							
Develop and promote mariculture using native species	Increased protein supply	Marine, University, private sector							
Seek the involvement of local communities and private sector in mariculture	Mariculture system for threatened species developed	Local communities, private sector, Marine, University							
Undertake assessments and monitor the populations of threatened and endangered marine resources	Surveys and monitoring instruments developed	Marine, University							
Assess the impact of the potential release of aqua-culture species into freshwater ecosystems	Potential problem species identified and culled	Marine, University							
Study the ecology of important freshwater species	Increased options for aquaculture	University, Marine							
Assess the socio-economic importance of freshwater and marine resources	Sustainable income sources developed	Marine, University							
Determine MSY for commercially valuable species	Baseline data developed	Marine, University							
Review government policies on fisheries management and development	Revised government policy on fisheries resources	Marine, NGOs, private sector, local communities							

Support educational and awareness raising programs about public policies and regulations on marine biodiversity	Well informed public	NGOs, Marine							
Promote relevant indigenous knowledge and practices about fisheries and their management	Integrated fisheries management	Local communities, private sector, Marine, NGOs							
Analyze gender issues and support women in the artisanal fishing industry	Women provided appropriate support services	Women's group, NGOs, Marine							
Promote and strengthen policies to prevent unsustainable exploitation of marine fisheries by trawlers	Less waste and dumping	Marine, local authorities, NGOs							
Organize training and information sharing workshops with stakeholders on sustainable fishing and management	Effective participation of well informed public	Marine, NGOs, local communities							
Provide human and technical resources for the marine and fisheries institutions to conduct research, surveillance, monitoring, etc.	Well equipped and functioning	Marine, University, Military							
Raise awareness about the risks of channel fishing	Less channel fishing	Marine, private sector							
Support and promote the conservation and rehabilitation of mangroves	Well protected mangroves	NGOs, Marine, Forestry, WCB							
Mandate and enforce the use of appropriate net sizes to prevent by-catch and wastage	By catch and wastage minimized	Marine, NGOs, WCB, Military							

Policy, Legislative and Institutional Review

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Review and update the Wildlife Conservation Act of 1972	A new act put in place	WCB, FD, NGOs, University							
Review and update national legislation on fisheries	New fisheries legislation	Marine, NGOs, University							
Review and harmonize land tenure practices that support biodiversity conservation	Biodiversity conservation across different property rights	NGOs, Lands, Judiciary, Forestry,							
Prepare a draft national biodiversity policy	A draft national biodiversity policy/bill	Forestry, Marine, Agriculture, Environment, NGOs, University							
Correct market distortions that undervalue biodiversity	Economic policy supportive of biodiversity	Development, Forestry, Environment, NGOs, University							
Encourage the sustainable exploitation of undervalued timber species	Increased supply of forest products	Forestry, NGOs, Local communities							
Regulate the destruction of coastal and marine ecosystems	Increased biodiversity	Marine, Forestry, Environment, Lands, Agriculture							
Strengthen and support family planning programs that reduce human population	Reduced pressure on biodiversity	Health, NGOs							

Enact policies and regulate uncontrolled discharge of sewage and pollutants into marine/coastal ecosystems	Tougher penalties for waste discharge and pollution control	Health & Sanitation, Environment, Marine, NGOs							
Promote and adopt policies that are sustainable in biodiversity exploitation	Efficient exploitation of biodiversity	Forestry, Marine, WCB, Agriculture, NGOs							
Pursue policies that do not lead to over-dependence on monocultures	Increased biodiversity	Forestry, Agriculture, NGOs							
Promote sustainable logging practices	Efficient harvesting of logs	Forestry, WCB, NGOs							
Assess marginal demand and consumption of NTFPs	Information for developing sustainable resource use	Development, NGOs, Forestry, University							
Establish a technical team on biodiversity to advice on the integration of biodiversity concerns into sectoral and cross sectoral policies	Intersectoral biodiversity planning body	University, Agriculture, NGOs, Forestry, Environment, private sector, Local communities, Marine							
Promote decentralization of natural resource management responsibilities with local authorities and communities	Local participation in managing biodiversity	Forestry, Environment, Marine, NGOs, University, Local communities							

Implement and enforce policies that aid in the sustainable conservation of biodiversity	Improved policy environment for biodiversity	Forestry, WCB, NGOs, Development, Environment, Marine							

Capacity Building

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Support and conduct a training needs assessment for government agencies and local NGOs	Human resource development needs	University, Forestry, Marine, Environment, NGOs							
Provide training programs for current professionals in fields critical to the conservation and sustainable use of biodiversity	Human capacity increased and improved	University, Forestry, Marine, Environment, NGOs							
Support networking among professionals in fields related to biodiversity	Increased capacity and quicker response time	University, Forestry, Marine, Environment, NGOs							
Support the training of taxonomists, para-taxonomists and tree spotters	Increased and improved technical team	NUC, FBC							
Conduct institutional needs assessment of all institutions with interest and responsible for biodiversity	Plan for developing biodiversity management capacity	University, Forestry, Marine, Environment, NGOs, Lands, Agriculture							
Provide financial and material support for institutions addressing biodiversity issues	Adequately staffed and equipped institutions	University, Forestry, Marine, Environment, NGOs, Lands, Agriculture							

Support and strengthen actions that establish self-financing mechanisms in institutions addressing biodiversity	Self-financing mechanisms established	University, Forestry, Marine, Environment, NGOs, Lands, Agriculture							
Support the review of policies and regulations that prevent the active involvement of NGOs in biodiversity conservation	Increased NGO participation in biodiversity management	NGOs, University, Forestry, Marine, Environment, Lands, Agriculture							
Enhance the capacity of local NGOs in relevant skills through training workshops and seminars	Increased capacity within NGO community	NGOs, University, IPAM							
Promote and support NGO access to relevant information held by government institutions	Informed NGO community	NGOs, University, IPAM							

Identification and Monitoring

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Organize workshops to ascertain national taxonomic priorities and the needs of the end-users of the information generated	National taxonomic priority lists	University, NGOs, Forestry, Marine, Agriculture							
Develop programs that focus on the re-training of a handful of professionals in taxonomy related fields	Training modules in Taxonomy	NUC, FBC, Rice Research							
Support the training of scientists in specialized fields like molecular systematics and bioinformatics	Increased national capacity	NUC, FBC							
Collect and collate information on practicing taxonomists in the country	National Register of taxonomists	FBC, NUC							
Inventory key taxonomic groups of plants, animals and micro-organisms	Updated register of fauna and flora	FBC, NUC							
Conduct an inventory of rare, threatened and endangered wildlife in the country	Updated information/data	WCB, NUC, FBC, FD							
Conduct an inventory of fauna and flora of all protected areas in the country	Well documented PAs	WCB, NUC, FBC, FD							
Carry out ecological studies on all threatened and endangered species	Species Action Plans produced	WCB, NUC, FBC, FD							
Establish and support a fully functional biodiversity monitoring unit in the Ministry of Agriculture, Forestry and Food Security	Fully equipped and staffed biodiversity monitoring unit	Forestry, University, Environment, Marine							

Conduct baseline surveys and inventories to determine the health and quality of key ecosystems	Biodiversity checklist	Forestry, WCB, University							
Support the use of GIS and other technology in monitoring change over time	GIS maps produced	Forestry, WCB, University, Environment, Survey, NGOs							
Monitor the population and distribution of large and exploited terrestrial and marine fauna	Status of exploited species	FBC, NUC, WCB, Marine							
Develop monitoring mechanisms for different threat levels to biodiversity in the different ecosystem types	Monitoring mechanisms established	University, Forestry, Marine, Environment							
Set up a database on the biodiversity of the country	National Biodiversity Database	NUC, FBC, NGOs, Forestry, WCB, Environment							
Identify biodiversity data sources and institutional capacities for collection, dissemination and managing biodiversity information	A plan for national biodiversity database management	NUC, FBC, NGOs, Forestry, WCB, Marine, Environment							

Sustainable use of Biodiversity Components

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Review current logging concessions to ensure future compliance	Certified logging operations	Forestry, NGOs, Development, Law Officers Department							
Promote the role of NTFPs in sustainable forestry	Increased supply of forest products	Forestry, NGOs, University							
Develop and promote timber certification programs	Sustainable forestry practices	Forestry, NGOs							
Develop criteria, guidelines and indicators for sustainable harvesting of NTFPs	Guidelines on harvesting NTFPs	Forestry, University							
Support and promote the domestication of preferred bushmeat species	Increased supply of meat	University, Livestock, WCB							
Support and promote the domestication/cultivation of important/exploited medicinal plant species	Income opportunities	University, Agriculture, Forestry							
Establish MSY for frequently exploited marine and freshwater species	MYS for different fish species	Fisheries/Marine, University							
Strengthen regulatory measures to minimize over-exploitation and by-catch	Strengthened regulatory system	Fisheries/Marine, private sector, NGOs, local communities,							

Promote mariculture and aquaculture	Fish farm development and increased supply of proteins	Fisheries/Marine, NGOs, Local communities, private sector							
Promote alternatives to slash-and-burn agriculture especially in the forest regions	Sustainable farming practices	Agriculture, Forestry, NGOs, University							
Promote organic farming methods and reduce reliance on agro-chemicals	Low-input cultural practices	Agriculture, NGOs, University							
Study and implement carrying capacities and guidelines for visitors to our protected areas	Reduced visitor impact	Tourism, University, WCB, NGOs							
Promote low-impact ecotourism and architectural infrastructure development in all protected areas	Sustainable resources	Tourism, University, private sector							
Promote the "no sale" of wildlife to tourists and visitors	Infection minimized and increased wildlife populations	NGOs, WCB, FD							
Promote educational awareness programs about human impact on our biodiversity	Informed public	NGOs, Marine, Forestry, WCB							

Incentive Measures

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Promote private sector investment in the sustainable exploitation of biodiversity	Private sector involvement	Forestry, University, WCB, Marine, Environment, Development							
Promote co-management arrangements with local communities and private sector	Community involvement	NUC, FBC, NGOs, Forestry, WCB, Environment							
Discourage unsustainable use of natural resources by strengthening existing laws, statutes and regulations	Tighter control on biodiversity exploitation	Forestry, WCB, NGOs, Development							
Promote the use of EIA prior to the conversion of natural areas into agro-pastoral lands	Institutionalized EIA	Environment, Forestry, Agriculture, WCB, University							
Promote policies that reduce the infrastructural development of mangroves, coastal areas and marine environment	Improved policy environment for sustainable development	Forestry, Environment, Lands, Development, University							
Promote low-input agriculture over high input agriculture through policy review and reforms	Low-input and sustainable cultural practices and favorable agricultural policy environment	Agriculture, University							

Study the impact of macro-economic factors arising from international trade, etc on biological diversity	Favorable macro-economic environment for biodiversity conservation	Development, Trade, Tourism, Forestry, Marine, NGOs							
Develop and support measures for the implementation of incentive measures	Legal and institutional framework for incentive planning	Judiciary, Development, NGOs, Marine, Forestry							
Target specific threats to biodiversity by providing targeted incentive measures	Well targeted incentive measures	Development, Forestry, Marine, NGOs							
Integrate both the economic and non-economic values of biodiversity into development plans and national accounting systems	An integrated methodology for evaluating biodiversity	Development, Forestry, Marine, NGOs, Trade, Tourism							
Promote taxation for private sector businesses that depend on biodiversity	Increased revenue base for biodiversity conservation	Development, Trade, Marine, Forestry, NGOs							
Provide tax breaks to businesses that promote programs to minimize their impact on biodiversity	Sustainable exploitation of biodiversity	Development, Trade, Marine, Forestry, NGOs							
Develop training programs for key planners, managers, NGOs and economists in the design and implementation of incentive measures	Training modules produced for planners, economists, NGOs, resource managers, students	University, IPAM, NGOs, Forestry, Development, Environment, Lands, Marine							

Develop compensation schemes for local communities whose access to protected areas has been curtailed	Compensation schemes for increased community compliance	WCB, Forestry, NGOs, Local communities, Marine							
Review and modify policies that create market distortions thereby leading to under-valuing and increased loss of biodiversity	Increased appreciation of biodiversity values	Development, Forestry, Trade, Tourism, Marine, WCB							

Research and Training

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Develop and implement policies on research and training	Institutionalized research and training programs	University							
Assess the impact of different forestry practices on the conservation of biodiversity	Information on the effects of forestry practices on biodiversity	University, WCB, Forestry							
Study the ecology of rare, endemic, threatened and endangered species	Information on the conservation biology of species	NUC, FBC, WCB, Marine, Forestry							
Conduct studies on the regeneration system of important timber and non-timber forest products	Increased supply of wood and non-wood products	University, Forestry							
Analyze the impact of different land uses on the maintenance of biodiversity	Information on land use effects on biodiversity	Lands, Environment, University, NGOs, Forestry, Development, Marine							
Determine the impact of alien/exotic species on local biodiversity	Information on the impact of exotic species on native species	University, Marine, WCB, Forestry							
Determine the impact of pollution on freshwater and marine ecosystems	Information on the effects of toxic pollutants on aquatic biodiversity	University, Marine/Fisheries							
Assess the impact of mining on biodiversity	Information on the impact of mining on biodiversity	University, Mineral resources							

Study successional processes in mined out areas	Guidelines for rehabilitating and restoring mined out areas	University, Mineral resources							
Study the consumption of NTFPs and recommend sustainable levels of exploitation	Information on consumption rates of NTFPs	University, Forestry							
Carry out research on the exploitation of sharks for the Asian fin soup market	Guidelines for sustainable exploitation	University, Marine							
Assess the impact of agro-chemicals on plant and animal life	Information on the effects of agro-chemicals on biodiversity	University, Agriculture							
Study the reproductive ecology of important non-timber forest products	Guidelines for managing NTFPs developed	University							

Public Education and Awareness

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Develop and promote a media campaign emphasizing the importance of biodiversity	Increased awareness of biodiversity	NGOs, Forestry, Environment, WCB, Tourism							
Develop and integrate biodiversity conservation and sustainable use of natural resources in school curriculum	Strengthened educational support services for biodiversity conservation	NGOs, University, Schools							
Provide support to local NGOs to engage in environmental awareness raising programs	Increased NGO capacity for extension services	NGOs, Forestry, Environment, Tourism, WCB, University							
Provide support for the production and dissemination of information materials on biodiversity	Diverse information materials produced	NGOs, University, FD							
Ensure teacher training institutions and colleges develop and implement appropriate courses in biodiversity	Trained and knowledgeable teachers on biodiversity issues	University, NGOs, FD							
Develop educational materials on endemic, rare, threatened and endangered species/resources	Increased knowledge of threatened species	University, FD NGOs, Marine, WCB							
Produce and disseminate educational materials like posters, newsletters, etc, on biodiversity	Increased awareness of biodiversity issues	NGOs, FD, University, printing presses							

Translate educational materials on endemic, rare, threatened and endangered species/resources into key local languages	Increased awareness among the public	NGOs, FD, Information, University, printing presses, local communities							
Encourage the print and broadcast media to cover biodiversity issues	Increased awareness of biodiversity issues	Information, NGOs, Ministries							

Access to Genetic Resources

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Analyze existing policy, legislative and administrative measures on genetic resources and benefit sharing	Report on legal, administrative and policy structure for genetic resources and benefit sharing	Agriculture, Judiciary, University, Marine, Forestry, NGOs, Development							
Assess the strengths and weaknesses of institutions and individuals addressing issues surrounding genetic resources and benefit sharing	Information on institutional adequacy and capacity levels	University, Forestry, Marine, WCB, Environment, Agriculture, Tourism, NGOs							
Conduct nation-wide awareness raising programs on the value of genetic resources, etc.	Informed public	University, Forestry, Marine, WCB, Environment, Agriculture, Tourism, NGOs							
Develop capacity of key individuals and officials through training in genetic resources and benefit sharing	National capacity built	University, Forestry, Marine, WCB, Environment, Agriculture, Tourism, NGOs							

Provide support for the development of entrepreneurial skills in bio-prospecting	Improved entrepreneurial capacity for bio-prospecting	University, Forestry, Marine, WCB, Health, Environment, Agriculture, Development, Trade, Tourism, NGOs							
Examine the impact on the status of genetic resources due to bio-prospecting	Information on genetic resources with potential for bioprospecting	University							
Develop a national policy measure to facilitate the equitable sharing of benefits arising from genetic resources	A manual on biodiversity benefit sharing	University, NGOs, Forestry, Agriculture, Marine, WCB							
Develop policy measures to regulate the exploitation and access to genetic resources	Controlled access and exploitation of genetic resources	University, Forestry, Marine, WCB, NGOs, Agriculture, Development, Trade, Tourism							

Indigenous Knowledge and Intellectual Property Rights

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Document past and existing resource management practices and knowledge in local communities	Information on indigenous knowledge for agriculture, forestry, fisheries and land use planning	University, Environment, Land, Forestry, Agriculture, WCB, Marine							
Examine the level of incorporation of indigenous knowledge and practices in current management and decision making processes	Information on knowledge utilization in management	University, NGOs, Environment, Land, Forestry, Agriculture, WCB, Marine							
Analyze existing laws and legislative policies that protect and promote indigenous knowledge and practices	Planning information on laws and policies protecting and promoting indigenous knowledge	University, Environment, Land, Forestry, Agriculture, WCB, Marine, NGOs, Local communities, Judiciary							
Ensure the protection of indigenous knowledge and practices relevant to biodiversity conservation	Planning information on laws and policies protecting and promoting indigenous knowledge	University, Environment, Land, Forestry, Agriculture, WCB, Marine, NGOs, Local communities, Judiciary							

Promote collaboration between government institutions and local communities in the use and adoption of indigenous knowledge and practices	Strengthened collaboration and cooperation between relevant government agencies and local communities	Forestry, WCB, Agriculture, WCB, Marine, NGOs, Local communities, Local Government							
Develop a national policy measure to facilitate the equitable sharing of benefits from the use of indigenous knowledge with particular reference to medicinal plants	Legal and policy environment for benefit sharing developed	Forestry, WCB, Agriculture, WCB, Marine, NGOs, Local communities							
Develop a national intellectual property rights system to safeguard the knowledge and innovations of local communities	A draft intellectual property rights system developed	Judiciary, NGOs, University, Marine, Forestry, private sector, Local communities, Agriculture							

Access to Technology and Handling of Biotechnology

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Assess and identify existing technologies relevant to the country	Checklist of relevant technologies identified	University, Education							
Promote the transfer of relevant technologies	Private sector involvement in technology transfer	University, Education, NGOs, Trade, Agriculture, Tourism							
Develop and enact patent laws to protect local inventions	Statutory framework for technology ownership	Judiciary, Trade, University, NGOs							
Design and implement measures to safeguard against the harmful introductions of genetically modified organisms	National Biosafety Authority constituted	Standards, Health, NGOs, University, Environment							
Develop standards and early warning measures against harmful introductions of genetically modified organisms	Control measures strengthened	Health, University, NGOs, Standards							
Support awareness raising programs on bio-safety and the associated risks with the mistreatment of biotechnology	Informed public about safety hazards of biotechnology	Education, NGOs, Health							

Information Exchange and Technical/Scientific Co-operation

ACTIONS	OUTPUT/SIGN	ACTORS	TIMEFRAME 2004-2010						
			04	05	06	07	08	09	10
Establish a National Biodiversity Database and Information Center	National biodiversity information Center	University, WCB, Forestry, Marine, NGOs, Lands, Environment							
Provide training in the collection, organization, updating and communication of biodiversity information	National human resource pool	University, private sector, NGOs							
Provide training to end-users to ensure full utilization of the information collected and stored	Increased public participation in using biodiversity information	University, NGOs, Education, Information							
Promote the development and implementation of joint initiatives with other countries on important biodiversity issues (e.g. trans-boundary protected areas for peace and co-operation)	Increased cooperation and experience sharing from other countries	Forestry, WCB, Foreign Affairs, NGOs, Development, Judiciary							
Encourage the exchange of experts and expertise with neighboring countries on biodiversity	Increased networking among experts	University, NGOs, Forestry, WCB, Agriculture, Tourism, Marine							
Promote and support regional co-operation in biodiversity conservation that border on trade in endangered species or genetic resources	Increased cooperation on anti-poaching measures	WCB, Marine, Trade, Judiciary, Police, Military, FD							

Support information exchange in remote and rural areas	Informal information exchange strengthened	Information, NGOs, Tourism, Local government							

Annex 2: PRIORITY PROJECTS & PROJECT CONCEPTS

Priority Project 1: Post-Conflict Reconstruction and Management of Protected Areas in Sierra Leone

I. Introduction

Sierra Leone is one of few countries in West Africa that lie within the Upper Guinean rainforest 'hotspots' in Africa. A diverse array of natural ecosystems supports a wealth of tropical biodiversity including several endemic plant and animal species. Prior to colonial rule, forest covered nearly 70% of the land area (Unwin 1925, Savill and Fox 1967). With the inception of timber trade in 1816, much of the forest was exploited to supply timber for the British shipbuilding industry. Subsequent invasion by slash-and-burn farmers, and little or no forest management thereafter reduced forest cover in the coastal areas, and increasingly in the interior to currently just under 5% (Gordon et al. 1979, CEPF Document 2001).

Exploitation of wildlife resources followed forest clearing. Traditional dependence on bushmeat has led to the depletion of wildlife resources in most areas in Sierra Leone. Ill-conceived and poorly implemented agricultural policies also encouraged bounty hunting, with the loss of an estimated 60,000 non-human primates between 1948 and 1950 (Jones 1951). With a booming population and an economy intricately linked to its biological and mineral resources, exploitation has severely reduced the quality of the biophysical environment and the loss of biodiversity continues at an alarming rate. Efforts to mitigate these threats are few, despite numerous recommendations from eminent conservationists regarding "priority actions" for conservation (Lowes 1970, Wilkinson 1974, Phillipson 1978, Merz 1986, Davies 1987, Bakarr 1992, Lebbie 2002d).

Progress has been largely constrained by lack of adequate technical and institutional capacities, as well as financial support for developing, and implementing effective conservation activities. Despite government intentions to set aside national parks, nature reserves, game reserves and sanctuaries, a full commitment to establishing protected areas has been slow. In terms of size, all proposed protected areas total just over 3% of the land area. Only 2 of the 18 protected areas have been gazetted as national park and wildlife sanctuary, with Outamba Kilimi and Tiwai, occupying these positions,

respectively. The 12 km^2 Tiwai Island Game Reserve was gazetted as a result of collaboration between two US universities (University of Miami and Hunter College) and Njala University College of Sierra Leone (Bakarr et al. 1999).

Ten years ago, Sierra Leone was engulfed in a civil conflict that not only destroyed its infrastructure, but also led to the over-exploitation of its biodiversity (Lebbie 1998, Garnett and Utas 2000). Future threats to biodiversity are envisaged, and it is prudent to assert that there is a need to support and implement changes in the way protected areas are managed and the institutions that are responsible for their management. Today, the war has come to an end with a new democratic government in place and a pledge to combat hunger. In accomplishing this pledge, natural resource management is a fundamental goal of the Ministry of Agriculture, Forestry and Food Security. The focus on biodiversity conservation, and in particular improving the management of protected areas is an important national strategy for reconstruction and sustainable development.

Objectives

In order to achieve the national strategy of biodiversity conservation, 4 key objectives have been identified to ensure that a representative number of protected areas across all ecosystem types get upgraded to the IUCN protected area categories (e.g., national parks, game sanctuaries, nature reserves, etc.). Adequate technical and financial support systems are crucial if the overall goal is to conserve Sierra Leone's biodiversity. The following objectives are proposed:

1. To establish and ensure management of 8 protected areas in representative ecosystems in Sierra Leone,
2. To establish and strengthen the system of managing the 8 protected areas across representative ecosystems,
3. To build local capacity for the effective management of the 8 protected areas in Sierra Leone, and
4. To establish a sustainable funding mechanism for the long-term management of all 8 protected areas.

Project Concepts

In order to achieve the four stated objectives, we are proposing four project portfolios with several activities as a national strategy for securing the future of Sierra Leone's protected areas and biodiversity. Almost 40 years of conservation assessments and recommendations for the establishment of protected areas in Sierra Leone have not led to any significant commitment to protected area management. Forest exploitation has taken precedence over management for the overall maintenance of biodiversity. The lack of trained personnel and financial support for protected area management and administration has hampered efforts in this direction.

The projects proposed are aimed at protecting approximately 80-90% of Sierra Leone's terrestrial biodiversity, by focusing on 8 priority sites. These sites include; (1) Outamba-Kilimi National Park, (2) Loma-Tingi Complex, (3) Western Area Forest Reserve, (4) Gola Forest Reserves, (5) Mamunta-Mayoso, (6) Yawri Bay, (7) Lakes Mape & Mabesi, and (8) Kangari Hills.

Advantages of the Projects

We envisage three major advantages of the proposed projects when properly implemented:

1. Jobs will be created for the multitude of Sierra Leoneans,
2. The environment and biodiversity of Sierra Leone will be safeguarded, and
3. Income will be generated in most local communities to alleviate poverty.

Project 1: Establish a system of 8 Protected Areas in representative ecosystems for the conservation of approximately 80-90% of Sierra Leone's biodiversity.

Activities:

1. Biodiversity assessment including the status of threatened and endangered species in all 8 protected areas,
2. Reviewing, updating and creating management plans for all 8 protected areas,
3. Establishing links with adjacent communities dependent on resources in protected areas, and
4. Reconstructing and equipping of park infrastructures.

Project 2: Establishing and strengthening the system of managing protected areas.
Activities:

1. Restructuring of Forestry Division to emphasize plantation forestry, reforestation and agro-forestry,
2. Involving local NGOs in the management of selected protected areas,
3. Elevating the status of the Wildlife Conservation Branch to a division/para-statal, and
4. Putting relevant policies in place to ensure all agencies and partners work together.

Project 3: Build capacity in the management of protected areas

Activities:

1. Training and recruiting graduates at the University of Sierra Leone, taking advantage of the BSc and MSc programs in Applied Ecology, Fisheries Biology & Wildlife Conservation and Forestry,
2. Training of rangers and guards at Mweka in Tanzania, and the South Africa College of Wildlife,
3. Building awareness among the public to support the management of protected areas

Project 4: Establish a sustainable funding mechanism for the long-term management of protected areas in Sierra Leone

Activities:

1. Set up a trust fund for long-term financial support and independence of protected areas,
2. Analyze the legal aspects of trust funds including its management, disbursement and use by institutional partners.

Time Frame for Implementation

Ten years starting 2004 and ending 2014.

II. Funding & Sources

A sum of $30 million is required. Approximately $15 million will be sought from the Global Environmental Facility (GEF). An additional $7 million will be secured from bilateral donors of Sierra Leone including DFID, USAID, DANIDA, SIDA, Dutch Government, Government of Japan, etc. The government of Sierra Leone is expected to commit $7 million in kind or cash over the life of the project.

Approximately $3 million per year will be spent for the first 5 years, divided across protected areas and institutional partners. The trust fund will be started with $7 million. The remaining funds will be spread over the second five-year period. The first 5-years will involve the establishment of the protected areas, training and reconstruction. The second 5-years will involve consolidation of the first 5-years.

III. Proposed Implementing Partner

UNDP, Sierra Leone

IV. Institutional Partners

Several institutional partners are envisaged, each with a crucial role in achieving the overall goal of establishing the different protected areas and ensuring the conservation of biodiversity. The different partners include:

Government Level

1. Ministry of Agriculture, Forestry & Food Security
2. Ministry of Lands, Housing & Environment
3. Ministry of Interior
4. Ministry of Tourism

Non-governmental Organizations

1. Environmental Foundation for Africa (EFA)
2. Conservation Society of Sierra Leone (CSSL)
3. Community Biodiversity Action Network (CBAN)
4. Birdlife International
5. Conservation International (CI)
6. Royal Society for the Protection of Birds (RSPB)
7. Green Scenery
8. Friends of the Earth
9. CHESIL

Academia and Research Organizations

1. Center for Biodiversity Research (CBR)
2. Njala University College (NUC)
3. Fourah Bay College (FBC)

Priority Project 2: Medicinal Plant Conservation in Sierra Leone

Introduction

Concern that medicinal plant knowledge is being lost has been eloquently phrased by the West African poet, Amadou Hampate Ba, who warns: "when an old man dies in Africa, an entire library burns"

In Sierra Leone, there is a great dependence on the use of medicinal plants in meeting the health care needs of people, a situation that is mirrored in other developing countries (Feierman 1981, Bichmann 1984, Farnsworth 1994). The reliance on medicinal plants is largely due to the prohibitive cost of commercial pharmaceuticals and the acute shortage of trained medical personnel. In developed countries like the US and Canada, secondary plant metabolites make up 25% of prescription drugs (Farnsworth 1984), while in Germany, it has been estimated that 80% of the physicians recommend some herbal products (Grunwald 1994). There is renewed interest in traditional medicine in both developed and developing countries because of its potential health benefits and economic contributions (Eisenberg et al. 1993, Grunwald 1994, Kuipers 1995). Brevoort (1995) has estimated the US herbal industry to be worth $1.6 billion.

Despite the growing recognition that medicinal plants are an important component of world trade (Lange and Schippmann 1997), concerns over the possible loss of this global resource are growing (Phiillipson 1997, Lambert et al. 1997). Forest clearance in tropical countries is progressing at an alarming rate, resulting in the loss of valuable medicinal resources (Abbiw 1994, Cole 1994). Increasing global demand for medicinal plant products has also led to the over-harvesting of wild plants. Nearly all medicinal plants exploited in developing countries come from the wild (Marshall 1998), where

destructive harvesting practices coupled with high rates of exploitation jeopardize the continued existence of natural populations (Cunningham 1990, Pandit and Babu 1997).

In the urban areas of most African countries, demand for medicinal plants is rising, and continues to endanger already depleted species. For example, in the Durban area of South Africa, extensive exploitation of *Mondia whitei* has resulted in local extirpation (Cunningham 1988). In a preliminary assessment of medicinal plant use in the Freetown peninsula of Sierra Leone, Lebbie (2001) found the growing scarcity of preferred medicinal plants to be met by vendors collecting from provincial towns located at considerable distances from the capitol. Over-exploitation of plant resources in Nigeria is contributing to the extirpation of the most common medicinal plants (Gbile 1994). In Cameroon, market demands for *Prunus africana* has resulted in its over-exploitation and concerns over its possible extinction on Mount Cameroon have been underscored (Kay 1997). In the Central Himalayas of India, Farooquee and Saxena (1996) found that substantial economic returns from medicinal plant harvesting have led herdsmen and households that once collected for a short period (two months) to devote longer periods (five months) to collecting herbs. In the southwest state of Puebla, Mexico, Hersch-Martinez (1995) reported that increased demand and a lack of adherence to traditional gathering practices by new gatherers threaten the survival of *Calea zacatechichi*.

As many traditional cultures disappear together with their knowledge of plant identification, collection and use, Africa stands to lose because of its dependence on these resources. Marshall (1998) highlighted these concerns and called for action before

"valuable species become rare or endangered". The prohibitive cost of most modern pharmaceuticals makes traditional knowledge about the efficacious use of medicinal plants a critical link for delivering cost-effective health care. Several studies have shown that traditional herbal knowledge may be useful in detecting bioactive compounds in plants (Farnsworth and Kaas 1981, Vanden Berghe et al. 1986). For example, in Bolivia, Abdel-Malek et al. (1996) have shown that medicinal plants of the Kallaway Indians provided important leads to new anti-HIV drugs.

There is an urgent need to document and implement conservation actions to save this important resource and the indigenous knowledge associated with it. The Center for Biodiversity Research recognizes that very little is being done to protect this global resource in Sierra Leone, where numerous plants are over-exploited (Lebbie and Guries 1995, Lebbie 2001).

Objectives

The primary thrust of this project is twofold: (1) to protect and conserve medicinal plants, and (2) to prevent the erosion of indigenous medicinal plant knowledge in Sierra Leone.

The main objectives of this project are:

1. To create a medicinal plant database documenting the indigenous knowledge and use of such plants,
2. To determine the structure of markets and trade patterns associated with important medicinal plants in Sierra Leone,

3. To implement an agro-forestry/domestication program that involves income generation and restoration of depleted medicinal plants,

Proposed Activities

1. Documentation of indigenous medicinal knowledge,
2. Conduct market assessments,
3. Design and implement a medicinal plant database,
4. Identify medicinal plants with market potential and in danger of over-exploitation,
5. Develop cultivation techniques and field trials of medicinal plants,
6. Develop ex-situ conservation of medicinal plants in selected local communities
7. Conduct seminars and workshops on benefit sharing and intellectual property rights,
8. Develop educational programs on safe use of medicinal plants, extirpation and extinction of medicinal plants.

Implementing Partners

1. Research Organizations
2. Local Communities
3. College of Medicine
4. Forestry Division

Timeframe for Implementation

Three years starting 2005-2007

Total Cost

US$420,000

Priority Project 3: Development and Implementation of a Biodiversity Database System (Bioinformatics)

Introduction

Information on the distribution, current status, level of threats and endangerment for most plant and animal species in Sierra Leone is unknown. Species name, distribution, rarity, current threats, utilization and level of protection will be the major defining fields of Bioinformatics system. This system will form the thrust of our monitoring system, and will be updated periodically through inventories and repeat checks.

Scientific information on biodiversity is hard to come by, and is also costly to institutions in Sub-Saharan African countries due to the prohibitive cost of scientific journals and the limited availability of computer technology. Sierra Leone intends to play a leadership role in this niche, by launching a biodiversity dissemination mechanism, maintaining an active web site with free access for government and educational institutions, and the Sierra Leonean public.

Objectives of the Biodiversity Database System (Bioinformatics)

- To compile critical environmental variables such as soils, vegetation and topography for rapid assessment of the regional distribution and abundance of habitats, without

the need for expensive and time-consuming field studies of species behaviour and habitat utilisation.

- to capture and map the distribution of cultural features such as settlements, roads, powerlines, mines and other human footprints that impact on the quantity and quality of local biodiversity
- To process and manipulate the database in order to identify spatial patterns and relationships; and monitor changes to the biological environment.
- For use in species richness mapping and to display selected attributes of the database as tables and graphs.
- For predictive modeling of the distribution and abundance of rare, endangered and threatened species.

As the biodiversity information is inherently spatial in nature, the database will be linked to a Geographic Information System (GIS). The GIS will be used as a data-gathering tool and a decision support system in the various components of the biodiversity project, including the EIA.

STRUCTURE OF THE PROJECT

The project will start with the development of a prototype for the environmental information system. It is the consensus of policy makers and NGOs that lack of ready access to valid, available environmental information is a cost constraint and a setback to improve use of environmental information in decision making in the country and throughout the sub-region. The Bioinformatics Unit will establish close collaboration

with several environmental institutions in the developed and developing countries, and will seek technical advice and support from a number of international groups working in the development of metadata standards and Internet communications in order to develop its prototype.

The prototype metadata project will include:

- Developing a design for the project database system;
- Establishing standards for certifying the quality of the environmental data;
- A process for mounting acquired data in a searchable form on the world wide web (www);
- Security consideration for providing secure, searchable access to electronically available data;
- A standard method for prioritizing data for conversion to digital format.

BENEFICIARIES

The primary beneficiaries of this project will be the Government of Sierra Leone, decision-makers, international research institutions and users of biodiversity environmental information. All Sierra Leonean and investors will be secondary beneficiaries from increased and appropriate use of reliable environmental information.

PROPOSED WORK PROGRAMME

A central database will be installed to hold baseline information. Information or data from subsidiary projects as they become available will be organized and stored for use. The Bioinformatics project in principle would involve:

i. **Data Policy**: Issues relating to data storage, maintenance, access and dissemination.

ii. **Data Management Plan**: Type of data to store (data integrity), project integration and long-term maintenance of data generated.

PROJECT STRATEGY, IMPLEMENTATION AND PLAN

1. This is a multi-faceted project, integrating information (data) from Biodiversity Coordinating Unit subsidiary projects.
2. The project will collaborate with the government, local agencies and NGO's, research and educational institutions, international institutions such as the world bank, UNEP, UNDP, UNESCO, ETI etc;
3. Specialist technical resources and expertise will be solicited from sources available to the Biodiversity Coordinating Unit.

ACTIVITIES, ORGANISATION AND IMPLEMENTATION

- System design and quality control;
- Personnel training;
- Data cataloguing services;

- Data conversion services;
- Project management, monitoring and control;
- Coordination and reporting.

Timeframe

Five years

Total Cost

US$1,500,000

Priority Project 4: Environmental Education and Awareness Raising Program

Introduction

The formal education sector in Sierra Leone does not reflect the increasing biodiveristy crisis facing the country. On a broader scale, the general public is either ill-informed or unaware of these problems. The Biodiversity Coordinating Unit intends to launch an Environmental Education and Awareness Raising Program (EEARP) that is practical and problem-oriented. The EEARP is based on the belief that the current environmental and biodiversity problems arose from people's behaviour and actions, and therefore it is the people - with adequate support from trained environmentalists - who should find a solution to these problems. The EEARP will adopt a collaborative approach that involves all major stakeholders (government, industry, NGOs, educational institutions, community groups and individuals) as partners in the planning, management and implementation of the programme. While designed to promote the environmental objectives of the Biodiversity Coordinating Unit, the EEARP will also reflect the social and economic objectives of the nation and the respective communities.

Aims and Objectives of the Environmental Education programme

The ultimate ***goal*** of the EEARP of the NBSAP is to create and enhance community awareness and understanding of the environmental and biodiversity problems facing Sierra Leone. It will provide individuals and community groups the knowledge and skills that are required to better manage the environment and its resources. An effective EEARP will engender a significant change in community attitudes and values and encourage a more responsible behavior towards the environment.

The specific objectives of the EE program are:

(i) to collect information on community knowledge, attitudes and perceptions of local changes in ecological and species diversity, as a foundation for designing practical and people-oriented environmental education program

(ii) to establish partnerships with agencies involved in EEARP in the country and to promote collaboration between major stakeholders, including scientists, non-governmental organizations (NGOs), industry, planners and decision makers and community groups, in matters relating to biodiversity.

(iii) to provide scientific information in a form understandable and useable by all stakeholders.

(iv) to launch a species awareness program to inform the consumers about the impact of the bushmeat trade.

Outcomes and outputs from the project will include:

- Increasing awareness of the impact of traditional land-use practices, intensive resource utilization and major development projects, on the environment and biodiversity
- Positive action by community groups and individuals to minimize environmental damage and to conserve biotic resources
- Evidence of increasing populations of rear, threatened and endangered species in the long term.
- Educational materials suitable for formal and informal education programs
- technical reports and articles published in journals and the web

Strategies/methods for implementing the EEARP

Given the low socioeconomic status and high levels of illiteracy among the target population, the Biodiversity Coordinating Unit will adopt the following strategies to achieve the project's objectives.

- Setting up a National Environmental Council, headed by the Minister of Lands, Housing, Country Planning and the Environment, and comprising experts in education, environmental science, community leaders and government administrators. The main functions of the council are to oversee and coordinate all EEARP and to identify priority issues for research and funding.
- Integration of principles of EEARP in Primary, Secondary and Tertiary education curricula to ensure that all students develop an understanding and concern for the natural environment by the time they complete their education.
- In-service training of teachers in principles of EEAR through short courses and workshops, as part of their professional development.
- Development and provision of environmental education resource materials such as audio-visual materials for public awareness campaigns, demonstration and extension.
- Use of mass media such as television, radio and newspapers as vehicle for disseminating EEARP and to get feedback and public opinion on environmental issues
- **Setting up and maintaining an active internet website, as well as publishing and distributing a journal to institutions with the responsibilities for managing biodiversity in Sub-Saharan African countries.**

- Setting up partnerships with NGOs and other organizations involved in EEAR activities.

Monitoring and evaluation of the EE programme

Both ***process*** and ***impact*** evaluation will be undertaken to assess the progress of the EEARP and measure achievement against the program objectives. This way it will be possible to identify strengths and weaknesses of the program, monitor performance and provide guidance for future directions**.** ***Process*** evaluation will involve focus group discussions, special audits, expert or peer reviews, and surveys on participation rates**.** ***Impact*** evaluation will be used to measure project impact over time.

Timeframe

Five years (2004-2008)

Total Cost

US$550,000

Priority Project 5: Resuscitation of the National Herbarium of Sierra Leone

Introduction

The Njala Herbarium or National Herbarium of Sierra Leone originated a little over 90 years ago. In 1906, C. W. Smythe, the curator of the Botanic Station in Sierra Leone began to collect plant and send them to Kew whilst retaining a collection of duplicates in the country. A large number of botanists followed his example with result that the Njala Herbarium became one of the largest and most important in West Africa. The humble beginnings of the National Herbarium began with the collection of Gardenia tricantha. During the early years of the century, all specimens in the herbarium were housed in the Forestry Department in Kenema but in 1920, the specimens were moved to Njala where they have remained ever since.

The importance of the collection of plants which is now housed at Njala University cannot be over-emphasized. Many of the descriptions of West African plants which are to be found in the definitive flora of the region that of Hutchison and Dalziel, refers to specific and numbered plants among the Njala Collection (re-TYPE SPECIMENS). This alone would be a sufficient justification for attempting to save the collection for the nation. A living and growing herbarium can, however, be seen as an essential part of the development of Sierra Leone.

With increased emphasis on agriculture the herbarium becomes a tool for research workers. Research on weeds and Germplasm cannot be successfully carried out without the herbarium. It may be foreseen that with increased agricultural development and research, the need for the herbarium would increase. It is a great advantage to be able to

identify plants with certainty in Sierra Leone; the alternative is to send specimens to botanic gardens in Europe, a long and costly venture. Requests are also frequently received from University Departments and drug companies for samples of plants of medicinal importance. A herbalist association has just been formed in Sierra Leone and attempts to record and preserve some of the secrets of local medicine before they are lost to posterity with the encroachment of western medicine, in which the herbarium could play a part.

There is growing and realistic appreciation of both the extent and pace at which man has been consuming, destroying, modifying and deteriorating our global our global environment, and in particular our plant resources which form the very base of the life-support systems of our planet. The most important recognition of the dangers facing plant life, and of the consequences for man if urgent steps are not taken, come from the United Nations Conference on the Human Environment dealing with plant and animal resources, their survey and conservation. When the main recommendations are considered, they cover survey of plant genetic resources, preparation of inventories, field exploration and collecting, in-situ and ex-situ conservation in botanic gardens and seed banks.

During the recent civil conflict, the campus of Njala University College was attached by rebels. Most of the college infrastructure was destroyed and with it the National Herbarium and several of the plant collections and the equipment. As Sierra Leone implements the NBSAP, it is expedient that the National Herbarium gets resuscitated to aid in the conservation of biodiversity.

Specific Objectives

1. To assess plant taxonomic needs and capacity at the national level,
2. To build and maintain the systems and infrastructure for obtaining, collating and curating plant specimens,
3. To provide for improved and effective infrastructure for accessing taxonomic information,
4. To provide training to young morphological taxonomists (systematists)

Activities and Outputs

1. To refurbish and equip the national herbarium,
2. To remount and reclassify the undamaged specimens,
3. To develop an accessible database system via the internet
4. Develop identification manuals and to update existing ones,
5. Survey, collect and identify and preserve plant specimens,
6. Build a reference collection of type specimens on the flora of Sierra Leone,
7. Set up a botanic garden attached to the national herbarium

Timeframe

Five years starting 2004-2008

Total Cost

US$935,000

Priority Project 6: Mapping and Documentation of the Flora and Fauna of Sacred Groves

Introduction

Outside of formal protected areas, small indigenous protected areas do occur in close proximity to villages (IUCN 1992) of certain ethnic groups such as the Kono, Mende, Temne and Limba. Termed sacred groves (Bakarr 1992, Lebbie and Freudenberger 1996), these areas are known to have existed long before British Colonial rule and the subsequent introduction of the protected areas system in Sierra Leone. Some sacred groves, locally referred to as poro bush (Parsons 1964) protect unique habitats and their constituent flora and fauna for use in ceremonies marking the passage of boys and girls to manhood. Such groves are not open to non-members and slash-and-burn agriculture are discouraged within their bounds. Occasionally, medicinal plants needed by the village community are collected from some of these groves and the surrounding landscape (Lebbie and Guries 1995). Other groves, which serve as ancestral worship sites and burial groves are open to the public but no form of encroachment is tolerated within them. Indigenous communities revere the groves, and violators are treated severely. Sanctions include the payment of livestock, a bag of rice and a drum of palm oil. Sometimes force is used to ensure compliance, and in an extreme case the individual is ostracized from the village community for persistent violations. Sacred groves also exist for women, but are smaller in size as compared to those for men.

Sacred groves represent fragments of original forests with most such areas between 1-12 ha in size. Though smaller in size, the numerous groves may constitute a

significant proportion of the remaining closed canopy forest outside the forest reserves in Sierra Leone. Their biological integrity appears questionable, especially for populations of larger vertebrates, but the groves are still large enough to contain populations of endemic species of invertebrates, smaller vertebrates, as well as valuable reservoirs of plant genetic resources. They have enormous potential as sources of seeds, invertebrates, or other biotic elements of value for any future ecological restoration work, especially in the areas now affected by diamond, rutile and bauxite mining. Since some these groves occur near forest reserves and parks, they may prove very valuable as ecological corridors for some groups of animals.

It is not clear how many such groves exist in Sierra Leone, nor is there information on the total land area occupied by the groves. No formal inventories or assessments of their potential for biodiversity conservation have undertaken because sacred groves were largely closed to European and North American scientists conducting biological surveys in the past. Bakarr (1992) hinted that such forest fragments could be major sources of endemism through Sierra Leone.

Objectives

1. To map the local of and area extent of sacred groves in Sierra Leone,
2. To inventory the biotic resources in sacred groves,
3. To identify cultural practices and knowledge that have aided in the protection and preservation of sacred groves in Sierra Leone

Activities and Outputs

1. A country-wide map of all sacred groves,
2. A list of plant and animal resources found in sacred groves,
3. Guidelines for the sustainable conservation of sacred groves,
4. A National legislation and policy on sacred groves

Timeframe

Three years starting 2005-2007

Total Cost

US$375,000

Priority Project 7: Inventorying the Non-Timber Forest Products (NTFPs) of Sierra Leone

Introduction

Non-Timber forest products (NTFP) are important resources exploited in the humid tropics of the world, both for subsistence and commercial uses. NTFP or secondary forest products, include plant and animal products, such as "bushmeat", fruits/seeds, poles, medicinal herbs, among others, that contribute to the economic welfare of a multitude of rural people in the humid tropics of West Africa (Falconer 1990). For much of this region, NTFP constitute neglected resources, and very few attempts have been made to inventory, value and conserve them (Wickens 1991, Lebbie 2001).

Objectives

1. To assess the relative distribution and abundance of NTFPs in the major forest reserves of Sierra Leone,
2. To document the value (socio-economic importance) of NTFPs to local communities and urban centers in Sierra Leone,
3. To examine gender differences in the exploitation and management of NTFPs,
4. To examine the impact of current harvest methods on the distribution and abundance of selected NTFPs,
5. To explore the potential for domestication of selected NTFPs.

Outputs and Activities

1. Conducting stock assessments for NTFPs
2. Assessing the socio-economic importance of NTFPs
3. Setting up of nurseries for the domestication of important NTFPs
4. Developing manual and guidelines on sustainable exploitation and marketing of NTFPs
5. Setting up pilot community plots on important NTFP cultivation

Timeframe

Five years starting 2005-2009

Total Cost

US$1,500,000

Priority Project 8: Post-Conflict Rapid Biodiversity Assessment of Large Mammals in Sierra Leone

Introduction

Biodiversity loss in tropical countries is a growing concern because these countries harbor approximately 50% of all life forms on earth. Biodiveristy loss stems from many causes including habitat loss, fragmentation, over-exploitation, exotic species introduction, chemical pollution and global climate change (Boyle and Boontawee 1995). In areas with exceptional concentrations of endemic species - so called "hotspots" - habitat loss is especially critical (Myers 1998, Pendergast et al. 1999). These hotspots comprise <2% of the earth's land area but harbor approximately 44% of the vascular plant species and 35% of the vertebrates (Myers et al. 2000). Unfortunately, virtually all hotspots exist in regions characterized by unregulated exploitation, contested land tenure, high levels of poverty, and little political will to conserve wild land and resources.

The Upper Guinean Rain Forest of West Africa, one of 25 hotspots around the world, has a rich mammalian diversity that is comparable to any 'biodiversity hotspot' in the world (Happold 1996, Bakarr et al 2000). This ecoregion is one of the most endangered hotspots due to habitat loss and a thriving commercial market in bushmeat. Recently, a primate subspecies, Piliocolobus badius waldroni (Miss Waldron's Monkey), was reported to have gone extinct in the forests of Ghana and Cote d'Ivoire as a result of habitat loss and hunting for bushmeat (McGraw 1998, Oates et al. 2000). This ecoregion has also been embroiled in a 10-year civil conflict, in which the impact on human lives

and biodiversity has been high (Richards 1997, Garnett and Utas 2000). Like in other African countries where civil conflicts have occurred, the depletion of wildlife by warring factions has been common. In the Casamance region of Senegal, reports of the disappearance of Tragelaphus spekei (Sitatunga), Trichechus senegalensis (Manatee), and reduced populations of Cercopithecus mona campbelli (Campbell's Monkey) and Bay colobus were confirmed (Burnham 1995). In the Parc National des Volcans of Rwanda, wildlife poaching increased substantially, with the consequent decrease in the numbers of black-fronted duikers (Plumptre et. al 1997).

Objectives

1. To conduct a nation wide rapid biodiversity assessment of mammals,
2. To determine the status of threatened & endangered mammalian species in the country,
3. To develop human resources in conservation and management of large mammals by providing field training to wildlife personnel and students at the University of Sierra Leone.

Activities and Outputs

1. Generate recent information on mammalian distribution and threat status
2. Develop guidelines on the conservation of threatened and endangered species
3. Provide training to students and wildlife personnel
4. Produce field identification guides

Timeframe

One year 2004-2005

Total Cost

US$320,000

Priority Project 9: National Reforestation and Rehabilitation of Degraded Forest Resources

Introduction

The most severe forms of deforestation took place during the decade old civil conflict especially alongside displaced camps and mining towns. The influx of displaced persons into major provincial headquarter towns necessitated massive deforestation as a means of survival. Almost 70% of the displaced communities became involved in deforestation activities: clearing land for farming, fuel wood cutting, charcoal burning, harvesting of poles and timber for domestic consumption and income generation. Most of the forest clearings were made in critical areas and if left unclaimed will result in landslides, destabilized water table and massive soil erosion and leaching of nutrients. This will have grave consequences for sustained food production and the maintenance of biodiversity.

Objectives

1. To ensure sound environmental management in war affected areas nation-wide,
2. To provide employment opportunities for youth groups,
3. To provide basic needs to resettled communities for firewood, charcoal, building materials and food through:

    (i) Agrogorestry practices thereby reducing pressure on the national forests

    (ii) To ensure community participation in environmental protection and management.

Project Outputs

A collaborative forest management team would be set up to tackle environmental problems in concert with the Forestry Division. Supplies of forest products (fuelwood, poles, charcoal, timber, etc) will be increased. Degraded forest areas will be restocked. Suitable agro-forestry techniques will be promoted to ensure food security.

Activities and Project Components

1. Rehabilitation of degraded areas around displaced camps. There is need to replant camp areas within the country that are devastated as a result of the war. It is estimated that about 10,000 acres will be reforested throughout the country.

2. Rehabilitation of the Northern Savanna Zones with Teak Plantation (*Tectona grandis*). Collaborative forest management involving the Forestry Division, the local communities and other institutions is needed to re-afforest the degraded savanna zone with high yielding teak plantations. Communities will not only benefit environmentally but will receive cash incentives for labor inputs. At present, there is a market for teak wood and small diameter poles are urgently needed from the tropics. Involving and sensitizing local communities to grow teak wood will provide incentives to embark on massive re-forestation programs. The main activity will involve establishing community nurseries, plantations and management practices geared towards thinning of plantations for small diameter poles to be exported to Asia.

3. Agroforestry development in the south and East of the Country. Agroforestry interventions will be urgently needed to resettle areas to alleviate food scarcity. Village and central nurseries will be established to raise tree seedlings in combination with

agricultural crops. Training of extension staff, field day training of farmers will be undertaken.

Timeframe

Five years starting 2004-2008

Total Cost

US$2,000,000

Priority Project 10: Nationwide Forest Inventory to Restore and Redefine the Forest Estate after the Civil Conflict

Introduction

In order to ensure the conservation of biological resources, its sustainable use and equitable sharing of benefits, there is need to take stock of the country's forest resources in the form of a comprehensive inventory. Past reports on the status of the forest resources are now obsolete and can no longer be used for planning management.

At present, there is a complete lack of data regarding the status of the forest estates. The last forest inventory was taken 30 years ago. Thus an inventory, and the re-establishment or degazetting of parts of the forest estate is a major priority for action. At present, forest reserve areas and boundaries are only estimated and in the light of widespread encroachment, there is need to reclassify reserve boundaries. Also, there are no management plans for high forest estates and most of the forest estates have never been inventoried for management purposes. The paucity of inventory data on forest estates makes management very difficult and result in poor management policy decisions.

Project Objectives

1. To provide baseline information on the total biomass production of the forest estates of Sierra Leone,
2. To provide information on yield estimates and annual allowable cuts prior to granting forest concessions,

3. To draw up management plans for the forest estates based on multiple use, ecosystem health and sustained yield production,

4. To collect data on threatened and endangered species in the forest estates to integrate into the management plan,

5. To train forestry personnel in the methodology and techniques needed in forest inventory.

Activities and Outputs

1. Management Plans

2. Data on forest resources of the forest estates

3. Satellite images and GIS map of the entire country

4. Delineation of vegetation types, logged and encroached areas, protected/community owned forests, woodlots and plantations and wildlife areas.

Timeframe

Two years starting 2004-2005.

Total Cost

US$2,000,000

Priority Project 11: Small Holder Domestication of Thryonomys swinderianus (Cutting Grass) as a preferred bushmeat species in Sierra Leone

Introduction

Most West African wildlife species are threatened by unregulated exploitation; habitat loss and hunting are cited as the premier causes of wildlife extinction (Davies 1987b, Starin 1989, Martin 1991, McGraw 1998, Fa et al. 2000). In West Africa, demand for wildlife as a source of protein (hereafter referred to as bushmeat) is high (Ajayi 1971, Asibey 1976, Jeffrey 1977, Martin 1983, Falconer and Koppell 1990, Njiforti 1996, Bowen-Jones and Pendry 1999). Such demand is an outcome of a rapid urban population growth, the high cost of alternative sources of meat, and an expanding corps of willing hunters (Wilkie et al. 1992).

Earlier surveys in Ghana, Nigeria, Senegal and Equatorial Guinea indicated that most households consume bushmeat on a regular basis, that bushmeat is an important source of protein in rural and urban areas, and that hunting and poaching bushmeat is a lucrative business (Cremoux 1963, Ajayi 1979, Martin 1983, Addo et al. 1994). Like other non-timber forest products (NTFPs) the trade tends to be segregated in terms of gender with men doing the hunting while women provide for processing and distribution (Addo et al. 1994, Ntiamoa-Baidu 1987). Trade in bushmeat is not well documented in Sierra Leone, but Bakarr and Turay (1996) present data on bushmeat trade for a four-month period in a small chiefdom. The trade centered on primates (Cercopithecus petaurista, Cercopithecus campbelli and Cercopithecus aethiops) and duikers (Cephalophus maxwelli and Tragelaphus scriptus), and household surveys indicated that

bushmeat exploitation was essentially a commercial enterprise and not for household consumption.

In Western, Central and Southern African sub-regions, the Cutting Grass is being developed to supply the protein needs of an ever increasing human population (Alexander 1992). In Ghana, it has been reported that the Cutting Grass or grasscutter is the most preferred bushmeat species, with trade in the species in excess of $59.7 million per annum (Ntiamoah-Baidu 1987). Domesticating the grasscutter will provide a source of revenue for local communities and small holder farmers, as well as alleviate the demand for more threatened mammal species like primates and antelopes.

Objectives

1. Develop techniques and methodologies for the profitable domestication of grasscutters in Sierra Leone,
2. Set up pilot projects in communities adjacent to protected areas for the domestication of grasscutters

Activities and Outputs

1. Collecting grasscutters from different parts of Sierra Leone,
2. Assessing the housing and feeding requirements,
3. Setting up small rearing schemes in local communities,
4. Producing a manual on the effective rearing and domestication of grasscutters,
5. Developing sex determination techniques

Timeframe

Five years starting 2004-2008

Total Cost

US$275,000

Priority Project 12:Co-management and Rehabilitation of Mangrove Ecosystem in Southwestern Sierra Leone

Introduction

Sierra Leone still has a large area of mangrove ecosystem but under immense pressure of over-exploitation and conversion to other uses. Mangroves are very important for the fisheries industry in Sierra Leone: as spawning grounds and as sources of firewood for smoking tons of fish. The growing demand for firewood is also taking a toll on the mangrove vegetation, and the lack of community participation in the management of these resources has created a *de facto* an open access regime.

Objectives

1. Involve key stakeholders in the management of mangrove ecosystem,
2. Develop an integrated management plan to be implemented by all key stakeholders,
3. Promote a process of legally designating chiefdom mangrove areas,

Activities and Outputs

1. Resource assessment
2. Establish chiefdom community mangrove management associations
3. Establish mangrove monitoring system
4. Prepare a management plan
5. Provide training to key stakeholders
6. Rehabilitate degraded mangrove sites

Timeframe

Five years starting 2005-2009

Total Cost

US$670,000

Priority Project 13: Control of Forest Fires in the Northern Savanna Region of Sierra Leone.

Introduction

Fires are common occurrences in the northern savanna region of Sierra Leone. Though fires play important role in the maintenance of the climax savanna vegetation, the frequency and intensity of annual fires coupled with human exploitation of the savanna trees for fuelwood, timber and charcoal are raising some concerns. Uncontrolled fires from slash-and-burn agriculture and the hunting of bushmeat have increased in recent times. Controlling the adverse effects of fires will serve to maintain the biodiversity of this important ecosystem.

Objectives

1. To reduce the uncontrolled setting of fires in the northern savanna zone

Activities and Outputs

1. Assess the extent of uncontrolled burning
2. Develop awareness raising programs about uncontrolled bushfires
3. Empower local authorities to take action against offenders
4. Develop measures to prevent uncontrolled fires

Timeframe

Two years starting 2004-2005

Total Cost

US$250,000

Priority Project 14: Capacity Building for Biodiversity Conservation in Sierra Leone

Introduction

The successful implementation and monitoring of the National Biodiversity Strategy and Action Plan will hinge on the setting up, staffing and equipping a National Biodiversity Coordinating Unit or Secretariat. The current activities in biodiversity conservation are not well coordinated, and cross-sectoral interactions in the implementation of biodiversity issues are non-existent in the relevant government ministries. A unit or secretariat responsible for biodiversity will serve to build the capacity of all relevant institutions by providing training, mobilizing and utilizing existing expertise and resources, and ensuring all the relevant institutions collaborate in the sustainable use and conservation of biodiversity.

Objectives

1. To establish, equip and adequately staff a National Biodiversity Coordinating Unit to implement and monitor the NBSAP,
2. To provide training programs for current professionals (government agencies and NGOs) in fields critical to the conservation and sustainable use of biodiversity,
3. To provide logistical support to key institutions and organizations addressing biodiversity issues in Sierra Leone.

Activities and Outputs

1. Set up, equip and staff a biodiversity coordinating unit/secretariat

2. Develop short term training programs

3. Provision of logistical support to relevant institutions and organizations

Timeframe

Two years starting 2004-2005

Total Cost

US$2,000,000

Priority Project 15: National Marine Biodiversity and Museum for Sierra Leone

Introduction

Sierra Leone has a coastline that is some 560 km long and the shelf covers (to 200m depth) an estimated area of 30,000 km2. The Exclusive Economic Zone (EEZ) is about 155,700 km2.

The first records of marine organisms of Sierra Lone is largely due to the work of Portuguese sailors in the 18th and 19th centuries. In Sierra Leone, coastal and marine biodiversity studies had earlier been undertaken only with respect to the fisheries resources (Hornell, 1928; Fowler, 1936; Stevens, 1945; Longhurst, 1957; 1963; 1965; 1971; FAO; 1990; 1992; Ssentengo and Ansa-Emuin, 1986; Coutin, 1989; IMBO, 2002).

The systematic study of the flora and fauna of Sierra Leone was a result of the conscious effort by the British Colonial Office to understand the nature of complex biotopes and later to exploit the resources. Some of the important studies include Aleem, 1979; Aleem and Chaytor, 1980; Bainbridge, 1960; Chaytor, 1979; Findlay, 1978; Lawson, 1954; 1957; Leigh, 1973; Longhurst, 1958; 1962; COMARAF, 1990; IMBO,, 1996).

The British Colonial Office established a regional centre for fisheries research (West African Fisheries Research Institute WAFRI) in Freetown in 1952. The complex housing WAFRI located at Kissy Dockyard was contained a collection of marine organisms which had been identified, categorized and meticulously recorded since the 1920s. In addition, some form of oceanographic work had also been going. The University of Sierra Leone and IMBO in particular had added considerable materials to what became the prototype of a Marine Biodiversity Museum.

The housing complex, the museum and laboratories were completely destroyed in a viscious arson attack during the rebel invasion of Freetown in January, 1999. The most impressive collection was lost forever with it some rare specimens. Ina time series the effect of human activities on biodiversity is now difficult to assess. The changes in composition are also not known. There is a need for the systematic collection, identification and preservation of materials for various purposes including:-

- teaching and demonstration

- monitoring of changes in composition
- assessment of interrelationship of organisms
- identification of organisms of economic importance
- as a source of tourist attraction

An early warning system on pollution and other changes could be set up to monitor to change in abundance of certain indicator species. As Sierra Leone implements the NBSAP a unique opportunity is presented for the creation of a Marine and Coastal National Biodiversity Museum as a National Monument.

Objectives:

1. To preserve and present a permanent record of marine and coastal flora and fauna.
2. To compare the present biodiversity with past records or records from adjacent regions that have remained relatively undistributed.
3. To assess the influence of human activities on the changes in marine and coastal biodiversity.
4. To serve as a teaching aid for scientists, researchers and students.
5. To serve as a source of information for Government on the best management measures to be adopted for our coastal environment.

Activities and Outputs

1. The construction of a museum with the appropriate support facilities including laboratories and libraries.
2. To train scientists including taxonomists, ecologists and curators.
3. To collect as many specimen as possible using local facilities.
4. To assess changes in levels of exploitation of commercial species.
5. To prepare a permanent data-base and manuals for the use by present and future generations.

V. Time frame

Five years starting 2004-2008

VI. Total Cost

US$ 1.5 million

Priority Project 16: Assessment of the Marine Finfish and Shellfish Stocks of the Inshore Coastal Waters of the continental Shelf of Sierra Leone.

Introduction

The 560 km long coastline as an estimated area of 30,000 km2 (to 200m depth). The continental shelf is about 100 km wide in the North at Yeliboya and tapers to only 13 km wide at Sulima in the South.

Over 200 species of finfish belonging to 79 families have been identified. Some 80 species have been shown to occur more frequently than the others. Finfish can be classified into two broad categories:- (i) Pelagic and (ii) Demersal.

Small pelagics are dominated by clupeids (sardinella of and Ethmalosa fimbriata. Large pelagics are dominated by the tunas, bonitos and barracudas. The demersals are dominated by two categories of fauna (Sciaenid and sparid) dominated by croaker and snappers respectively (Longhurst,1968; Fager and Longhurst, 1968; Coutin, 1989). The shellfish consists of shrimps, lobsters, crabs, cephalopods, gastropods, bivalve and crabs.

The most reliable estimates of fishery Resources biomass are based on dome 40 survey's between 1968 and 1990. They were intensive surveys conducted by the Soviet Union between 1976 and 1989. From the various estimates it is reasonable to assume that the true stock size lies between 500,000 – 750,000mt. The stock sizes and MSY respectively for major categories are as follows:- Shrimps (15,000mt, 3000mt); Pelagics (360,00mt, 140,000mt); Demersals (110,000mt, 50,000mt); Cephalopods (30,000mt, 10,000mt,) (Ndomahina, 2002).

From a management point of view there are two types of Fishery (Industrial and Artisanal) sectors. Trends in fleet composition indicates that shrimp trawlers have not shown any rapid decline since 1980 whilst the demersal trawlers and purse seiners have reduced their activities significantly.

Production figures (total annual landings) indicate that there has been dramatic drop from 230,000mt in 1990 to a mere 62,000mt in 1996. The industrial fleet contributed about 180,000mt in 1990 and 15,000mt in 1996 respectively to the annual total landings largely due to the withdrawal of the Soviet Purse Seiners. Between 1990 and 1992 there was a further drop in numbers of all categories of demersal vessels largely due to the effective patrols mounted by a private survelliance firm and the navy.

The fleet composition of the artisanal fishery sector remained remarkably constant between 1970 and 1990. About 20,000 fulltime fishermen were registered in this sector operating some 6000 canoes. In 1990, 22% of the fish harvested came from the artisanal sector. Nowadays, (2003) the artisanal sector accounts for 75% of all fish harvested annually. In real terms 50,000mt (1990), 46,0000mt (1996) and 46,000mt (2002). The rebel war hit the fishery sector very hard working to an overall reduction in productivity.

In Sierra Leone there is evidence of over exploitation of certain categories of target species including snappers (Dentex angolensis, D. congensis, D. canarensuis, pagellus belloti), sciaenid fauna (Pseudotolithus senegalensis, Drepane africana, Galeiodes decadactylus, Ilisha africana latiscutatus). The artisanal fishermen have recorded very low levels of catch in recent times which they blame largely on the activities of the trawlers which make persistent incursion into the IEZ the latter being an important breeding and nursery ground for many important aquatic organisms.

There is an increase in various violations of the fisheries laws especially those relating to mesh-sizes and generally to poor observances of the code of conduct for responsible fishing among both the industrial and artisanal fisheries sector. There is also an unusually high incidence of conflict and confrontation between the industrial fisheries and artisanal fisheries sector especially in the IEZ.

In order to rationally manage the fishery resources of our coastal and marine resources, an accurate assessment of stock levels is required.
The lost survey by the FAO tool place in 1990.

Objectives

1. To assess the present state of biomass levels of the important finfish and shellfish stocks
   and their distribution in the coastal waters of Sierra Leone.
2. To determine the exploitation rate of important stocks.
3. To assess the degree of compliance with the present fisheries laws in both the industrial and fisheries sector.
4. To establish a proper framework for the monitoring of the distribution patterns and stocks levels of major resource categories of finfish and shellfish.

5. To provide a sound scientific basis for a lalistic and integrated approach to the management of our coastal resources.

Activities

1. To train scientists and field staff in stock assessment and biological techniques.
2. To Refurbish and equip institutions with the requisite capacity for carrying out scientific work.
3. Survey and sampling at sea using ships of opportunity.
4. Analyse the data to establish stock levels, distribution and exploitation rate.
5. Review Fisheries Policies and introducing of new management in line with the results of scientific investigations.
6. Awareness raising exercises among stakeholders on the adoption of the code of conduct responsible fishing.

Timeframe

Five years starting 2004-2008

Total Cost

US$ 1.0 million

Priority Project 17: Studies on the Biodiversity of Major Estuarine Systems of Sierra Leone

Introduction

There are three (3) major estuarine systems in Sierra Leone (Scarcies, Sierra Leone River, Sherbro River). The scarcies estuary consists of two rivers (Great and Little Scarcies) located in the North which merge towards their mouth before emptying into the Eastern Atlantic through a shallow coastal plain estuary.

The Sierra Leone River Estuary is a drowned river estuary that is formed from three(3) main rivers (Port Loko River, Rokel River and Bunce River), many creeks and streams.

The Sherbro River Estuary is an estuarine complex located in the Southern part of the country. It receives discharge from various rivers and streams among which are the Kittam, Jong and Wange. The Kittam forms a common estuarine channel with the Sewa and Wange rivers.

Apart from the Sierra Leone. River Estuary that has been extensively studied, not much is known about the Scarcies and Sherbro River Estuaries. The estuaries share some common features. Both the Sierra Leone River Estuary are navigable for long stretches (over 100km) and have extensive. Coastal artisanal transportation systems. The estuaries are stratified and fringed by mangroves with extensive sandy and muddy flats. Apart from coastal transportation, mangroves are exploitated as a source of fuel wood, timber and cleared for rice production and salt manufacture. There are also coastal infrastructural development and waste disposal. Almost all the coastal village situated along rivers and estuaries are places of extensive fishing activities.

Estuaries are fragile and under pressure especially during the period of reconstruction. A systematic study of the estuaries is therefore a necessity f the biodiversity of these important systems.

The studies should relate to the water quality analysis including salinity, pH, oxygen and nutrient analysis. The sediment types and distribution should be studied.

The biota to studied include Plankton (Phytoplankton and Zooplankton), Benthos, Fish, Reptiles, Birds and Mammals. Mangrove flora and fauna types and distribution needs to be understood. With the war now over, the NBSAP affords us the opportunity of assessing the impact of anthropogenic activities on estuarine biodiversity.

Objectives

1. To build capacity at various institution for estuarine biodiversity research in various fields.
2. To build and maintain the systems and infrastructure for effective surveys, collating and dissemination of information.
3. To assess the impact of various anthropogenic activities on the estuarine biodiversity.
4. To raise awareness among stakeholders on the rational and sustainable use of resources.
5. To establish a system of monitoring of biodiversity changes within the estuarine systems.

Activities and Outputs

1. To introduce curricula into institutions of higher learning with focus on biodiversity, including estuarine environment.
2. Design and carryout surveys on each of the major estuaries.
3. Identify the major biotopes of estuaries (sand and mudflats, mangroves hydrographics or overlying water).
4. Investigate the hydrographic condition (Physical and Chemical).
5. Investigate the biota (Plankton, Benthos, Nekton).
6. Undertake an investigation into the various activities that may adversely affect the estuarine biodiversity.

7. To institute mitigation measures including restoration whenever necessary.

Time frame

Five years starting 2004-2008

Total Cost

US$ 1.5 million

Priority Project No.18: Small Ruminants Restocking Program

Introduction

The livestock industry in Sierra Leone has a lot of untapped potential. Before the outbreak of the civil conflict, livestock contributed approximately 3% to the GDP. This sector is now at its lowest ebb after the decade-long civil conflict, which affected every livestock producing areas in the country. Anecdotal evidence suggests that 85% of the national herds of the country were destroyed during the civil war. Most cattle presently slaughtered in the country originate from Guinea.

The civil conflict impacted negatively on the performance of the private sector. Besides the destruction of livestock populations, the commercial rearing and processing facilities were destroyed also. Commercial piggery and poultry production in most towns and rural areas have been reduced in capacity.

The traditional livestock in Sierra Leone consists of cattle, small ruminants and pigs. Although there is no data available on animal population in the country, but the 1979 census data showed the following population figures: 333,200 cattle, 264,000 sheep, 145,000 goats, 17,000 pigs and 3 million poultry (Shaw and Hoste 1987). Recent estimates after the civil war put the figures at: 102,000 cattle, 79,200 sheep, 43,500 goats, 5,100 pigs and 900,000 poultry.

Objectives

1. To reactivate a dependable income generating activity for the resettled farm families by restocking,

2. Provide a source of breeding animals for the resettled farm families in several chiefdoms,

3. Promote improved animal husbandry practices in rural and urban communities,

4. Provide extension services to communities participating in the restocking program

Implementation and Activities

1. A total of 400 farm families in five districts (Bombali, Kambia, Kono, Moyamba and Tonkolili) will be targeted,

2. Training in improved animal husbandry,

3. Setting up of project team,

4. Purchase of animals and veterinary drugs,

5. Pre-treatment of animals against common diseases.

Time Frame

1 year starting 2004-2005

Total Cost

US$200,000

Priority Project No.19: Gola Conservation Concession Development Project

Introduction

Since 1990, the Conservation Society of Sierra Leone (CSSL), the Forestry Division, and the Royal Society for the Protection of Birds (RSPB) have been collaborating in programs for the conservation of the globally important Gola Forests in eastern Sierra Leone. These forests represent the largest remnant of the humid forest that once covered much of Sierra Leone, and one of the best examples of Upper Guinea Forest in all of West Africa. The forests are home to a number of rare and threatened plant and animal species.

With the restoration of peace and increased stability in Sierra Leone, CSSL and its partners agreed to work together on a new program for the Gola Forests. As part of this process, studies were carried out in 2003 on the condition of the forest and the needs and perceptions of adjacent forest communities. Meetings were also held with chiefdom representatives, at which there was substantial agreement on the approach to forest conservation. In July 2003, a Participatory Planning Workshop was organized in Kenema involving the Government of Sierra Leone, representatives of the seven chiefdoms around the forest, CSSL, RSPB, Conservation International and other interested stakeholders. This workshop reached broad consensus on the need to conserve the Gola Forests for biodiversity and sustainable use. The workshop also agreed on a strategy based on a conservation concession as the most promising approach to secure the long-term conservation of the forests. Further, it was agreed that a three-year development phase is needed to put in place all the conditions for a successful launching of a functional conservation concession and supporting activities.

In an effort to secure the future of protected areas in Sierra Leone, the Gola Forest Conservation Concession is being promoted as an off-shoot of Priority Project No.1 above.

Objectives

1. To develop a conservation concession agreement on the Gola Forests between Government of Sierra Leone, Conservation NGOs and adjacent local communities,

2. To develop the capacity of Forestry Division, CSSL and local communities to ensure proper management of the Gola Forests,

3. To promote sustainable use of the forest resources and generate income from such activities that will enhance the conservation of the forest,

4. To increase awareness among the Sierra Leone population about the value of conserving Gola forests, and

5. To set up a funding mechanism to support the long-term conservation of the Gola Forests.

Activities

Several activities are envisaged with some listed below:

1. Submit a formal application to the Government of Sierra Leone for a logging concession,
2. Develop an agreement on the area of the concession, the amount of compensation for logging rights and benefit sharing by the Government and communities,
3. Develop and finalize the overall conservation concession agreement,
4. Provide logistic support to the Forestry Division to play a more active role in forest management,

5. Support the Paramount Chiefs to disseminate information on the program to the broader population,
6. Identify other priority capacity-building needs of the Forestry Division and communities necessary for the success of the conservation program,
7. Provide material support to priority infrastructure projects in each chiefdom, with local materials and unskilled labor provided by communities,
8. Coordinate with other agencies and donors, and encourage them to undertake complementary development oriented activities in the Gola communities,
9. Encourage and support community leaders and Forestry Division to stop illegal logging by power saw operators,
10. Formally apply to the Government for a moratorium on logging concessions in Gola during the three-year development phase of the conservation concession,
11. Support the Forestry Division to clear and mark the forest boundary in critical areas where illegal activities are going on, using local labor,
12. Together with stakeholders, identify the key target groups having influence on forest conservation.
13. Identify the most cost-effective methods of conveying information to the priority target groups.
14. Initiate an education program based on the priority target groups and methods.
15. Identify funding needs and amounts for the long-term concession program.
16. Identify and set up trust fund mechanism in consultation with partners.
17. Raise funds for the trust fund.
18. Raise funds for complementary development activities.

Timeframe

Three years starting 2004-2006

Total Cost

US$5-10 Million

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