REPUBLIC OF CAMEROON

Peace – Work - Fatherland

NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN VERSION II

(NBSAP II)

December 2012

CITATION

THIS STRATEGY DOCUMENT WILL BE CITED AS:

@ Republic of Cameroon 2012, National Biodiversity Strategy and Action Plan – Version II – MINEPDED

OR

@ Republic of Cameroon 2012, NBSAP II – MINEPDED

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PREFACE

In May 2012, along the margins of the Celebration of the International Day of Biodiversity, Cameroon launched the revision of its maiden National Biodiversity Strategy Action Plan. This document, presented as a second version of Cameroon's National Biodiversity Strategy and Action Plan (NBSAP II) is the outcome of this process.

The validation of NBSAP II demonstrates the recognition of Cameroons rich biodiversity as an invaluable natural asset for the wellbeing and development of its people, and the need to safeguard this asset. This document further consolidates the commitment of the Government within the framework of the Convention on Biological Diversity to develop a planning tool that translates into national reality, the global vision of *living in harmony with nature* where man benefits from biodiversity while ensuring an ecological sustainability.

Over the last decade, Cameroon has invested great efforts to preserve its rich heritage. As an outcome, the trend in protected area management depicts an escalating increase beyond the set global target. Increasing discoveries of plant and animal species endemic to the ecosystems today establish the national domain as a gold mine of biodiversity for science and development. Notwithstanding these efforts, increasing threats from human behaviour and emerging issues of climate change and natural disasters largely undermine the gains in protecting biodiversity. The benefits from biodiversity and ecosystem services are yet to significantly contribute in improving livelihoods and in the fight against poverty.

In developing this second version of the NBSAP, a focused attention has been given to understanding the causes and consequences of biodiversity loss. On the basis of a renewed vision of responsible behaviour in the use and the sharing of benefits from biodiversity as a means to ensure development that is sustainable, a more dynamic and targeted intervention approach has been adopted in this document. The four strategic objectives set by NBSAP II are an urgent call to reverse the current trend in biodiversity loss. Increasing awareness on the value of biodiversity is critical to ensure a change in human behaviour and attitudes that today favour loss in biodiversity. Again strengthening our efforts in mitigating or restoring degraded ecosystems and species is critical to redress the consequences of the loss of biodiversity on the ecological environment. A third priority focuses on human wellbeing calls for more proactive measures to generate wealth from biodiversity and the services offered by the ecosystems. And finally, the fourth strategic objective recognizes mainstreaming as the most appropriate approach to ensure the effective appropriation of NBSAP II by key sectors and decentralised authorities.

It is important to highlight that the foundation for developing the rural production sector within the 2035 national Vision for development and its Growth and Employment Strategy is the rich biological diversity of the nation and the services offered by its diverse ecosystems. Conceived in a timely manner, the NBSAP II therefore provides a major contribution for planning reference in all biodiversity related programs and development projects to be carried out in the key production sectors by government departments, private investors and other stakeholders in the effort to promote growth that is sustainable.

This justifies the wide consultation process that was employed in the preparation of this document. Specific sector and ecosystem-based consultations carried out, have secured the

transversal and adaptive character of biodiversity planning in this document which takes into consideration specificities of diverse ecosystems and sectors of development.

Coordination, the role assigned to the Ministry of Environment, Protection of Nature and Sustainable Development (MINEPDED), constitutes a central challenge for the successful implementation of the options of this revised Strategy. I wish to recall that the way forward was set in the early stage of the conception of this document developed under the coordination of MINEPDED. All Government departments, NGOs, private sector, CSOs, local communities, women's groups, indigenous groups etc.... by participating, have ensured that the choices opted for in this document is a collective decision. In conformity with Principle 2 of this document, this has imposed a collective responsibility for all to ensure the successful implementation of the revised National Biodiversity Strategy and Action Plan under the coordination of MINEPDED.

H. E. HELE Pierre
Minister of Environment, Protection of Nature and Sustainable Development.

HELE Pierre

ACKNOWLEDGEMENT

The National Biodiversity Strategy and Action Plan Version 2 is the output of the valuable contributions from key actors involved in the protection of the nation's biodiversity and national and international experts in biodiversity protection. These included individuals and representatives from the Focal Institution for Biodiversity, relevant sector ministerial departments, local community groups, private sector and National and International Organisations and NGO's as recognized below.

The revision process was carried out under the watchful supervision of the Minister of Environment, Protection of Nature and Sustainable Development, H.E. HELE Pierre, assisted by the Minister Delegate in the said Ministry, H.E. NANA ABOUBAKAR DJALLOH.

To guarantee the technical orientation required in the revision process and safeguard the cross sectoral character of biodiversity issues, a Biodiversity Inter-ministerial Advisory Committee was set up with representatives from key sector Ministries. The contributions of the members of the Committee in reviewing and adopting the project work plans and technical documents submitted were highly invaluable to the successful realisation of this work. The members were:

- Mr. AKWA Patrick KUM, Secretary General in the Ministry of Environment, Protection of Nature and Sustainable Development (MINEPDED) representative of the Minister as Chairperson of the Committee,
- Mrs. GALEGA Prudence Tangham, Technical Adviser No.1 MINEPDED and National Focal Point for the Convention on Biological Diversity,
- Mr. WANGNOUN Valentin, Inspector No 1- MINEPDED
- Dr. WASSOUNI – Director of Conservation Monitoring and the Promotion of Natural Resources- MINEPDED;
- Mr. LINJOUOM Ibrahim - Ministry of Forestry and Wildlife
- Mr. KUETE Fidele – Ministry of Forestry and Wildlife
- Dr. CHEPDA Vitalis –Ministry of Livestock, Fisheries and Animal Industries
- Mrs. EKOBO Edith-Collette - Ministry of Agriculture and Rural Development
- Dr. TCHATAT Mathurin – Institute of Agricultural Research for Development

The Inter-ministerial Advisory Committee worked closely with a Project Team set up to ensure an effective coordination of the NBSAP revision process. These were:

- Mrs. Prudence Tangham GALEGA, appointed as Project Coordinator and,
- Cecilia MUNJI and Wilson NJING SHEI who served as Project Assistants.

The critical review and observations of the coordination team was highly useful in improving the quality of the document.

Green works Company Ltd, hired as the consultant firm for the production of the document engaged a team of experts with long standing experience and expertise in biodiversity conservation and management of specific ecosystems and thematic areas. These were:

- Dr. TATA FOFUNG Thomas – Director of Greenworks and Team Leader.
- Dr. AJONINA Gordon Mwutih - Marine and Coastal Ecosystem expert.
- Dr. CHUYONG B. George – Tropical Dense Humid Forest Ecosystem expert.
- Dr. MBAH David – Tropical Savannah and Montane Ecosystems expert.
- Dr. MESSINE OMBIONYO Anatole – Semi-arid Ecosystem expert.
- Dr. CHIAMBENG George Yongbi – Freshwater Ecosystem expert.

This work also benefited from a significant contribution of NGOs under the coordination of NESDA-CA/GREG-Forêts. Realising this work called for specific thematic studies carried out by a series of experts. These were OSSOU Zolo, Antoine EYEBE, NDO Angeline, DINSI Stanley, Simeon EYEBE,

Julie GAGOE and ENDAMANA. Specific to finalizing the indicators, significant contributions were made by Dr KENFACK Jean, Mr. FORGHAB Patrick and Mrs. WADOU Angele of MINEPDED. Contributions on CITES considerations were made by Mr. KPWANG Abessolo (Representative of MINFOF, Administrative Focal Point of CITES) and MBARGA Narcisse of ANAFOR and National Flora Focal Point for CITES .

Several reviewers dedicated valuable time in the review of draft documents and the proof reading of the document. These included experts from the SCBD, WCMC-UNEP, CARPE, IUCN, TRAFFIC and GWP-Cameroon.

For the translation of the original English version into French, Mr. Emmanuel NCHAMUKONG and a team of translators were engaged while the proof reading of the French version was ensured by M. NYONGWEN Joseph and Mme WADOU.

The activities in the development of NBSAP II were carried out with the financial support of the Forest Environment Sector Program (FESP), the Global Environment Facility (GEF) and the United Nations Environment Program (UNEP).

TABLE OF CONTENTS

LIST OF BOXES

LIST OF FIGURES

LIST OF PLATES

LIST OF TABLES

ABBREVIATIONS

ABS:	Acess and Benefit Sharing
ASFV:	African swine fever Virus
CBD:	Convention on Biological Diversity
CBFP:	Convention on Biodiversity Focal Point
CBOs:	Community-based Organisations
CEFDHAC:	Networks for Civil Society Organisation in the Forest Ecosystem
CFC:	Control of Chlorofluro Carbons
CITES:	Convention on International Trade in Endangered Species
CMR:	Cameroon
CMS:	Convention on Migratory Species of Wild Animals
COMIFAC:	Commission des Forets de L'Afrique Central
COP:	Conference oof Parties
DNA:	Deoxyribonucleic [d(eoxyribo)n(ucleic)a(cid)]
EIA:	Environmental Impact Assement
FAO:	Food and Agricultural Organisation
FESP:	Forest – Environment Sector Program
FLEM:	Framework Law for Environmental Protection
FMDV:	Food and Mouth Diseases Virus
FP:	Full Scale Project
GDP:	Gross Domestic Product
GEF:	Global Evironment Facility
GESP:	Growth Employment and
GICAM:	Cameroon Buisness Group
GTBAC:	Central African Biodiversity Working Group
GWP:	Global Water Partnership
IAS:	Invasive Alien Species
IBRD:	International Bank for Reconstruction and Development
IMF:	International Monetry Fund
IMPM:	Institute Medical pour Les Plantes Mdecinales
IP:	Indigenous People
IRAD:	National Inistitute of Agricultral Development
IRD:	Institute for Research and Development
ITTO;	International Tropical Timber Organisation
IUCN:	International Union for the Conservation of Nature
IWRM:	National Intergrated Water Resources Management Plan
KNP:	Korup National Park
LMO:	Living Modified Organisms
MINADER:	Ministry of Agriculture and Rural Development
MINEE:	Ministry of Energy and Water Resources
MINEF:	Ministry of Environment and Forestry
MINEP:	Ministry of Enviornment and Protecteion of Nature
MINEPDED:	Ministry of Environment, Protection of Nature and Sustainable Dveleopment
MINEPIA:	Ministry of Livetock, Fisheries and Animal Industry
MINFOF:	Ministry of Forestry and Wildlife
MINRESI:	Ministry of Scientifique Research and Innovation

MINTOURL:	Ministry of Tourism and Leisure
MSP:	Medium Seize Project
NBSAP:	National Biodiversity Strategy Action Plan
NEMP:	National Environment Management Plan
NGO:	None Government Organisation
NIH:	National Institute of Health (USA)
NIS:	National Institute for Statistics
OPRC:	International Organisation on Oil Pullution Preparedness, Response and Cooperation
PAN/LCD:	National Plan for the Fight against Desertification
PIC:	Prior Informed Consent
PM:	Prime Ministry
PNDP:	National Program for the Participation in Development
REDD:	Reduction of Emmission from Deforestation and Degradation
REDD+:	Reduction of Emmission from Deforestation and Degradation
REFADD:	Networks for Women
REPAC:	Sub regional Network for Protected Areas
REPALEC:	Sub regional Network for Indigenous People
REPAR:	Sub Regional Network for Parliamentarians
RSDS:	Rural Sector Development Strategy
SMART:	Specific, Measurable, Achievable, Realistic and Time-bound
SODECOTON:	Coton Development Corporation
SWOT:	Strengths, Weaknesses, Opportunities and Threats
TK:	Traditional Knowledge
UNFCCC:	United Nations Framework Convention to Combat Climate Change
UNCLOS:	United Nations Convention on Law of the Sea
UNEP:	United Nations Enviornment Program
WCMC:	World Climate Monitoring Centre
WWF:	World Wide Fund for Nature

EXECUTIVE SUMMARY

1) Cameroon is endowed with a rich biological diversity within diverse ecosystems that are largely representative of Africa's ecosystems resulting in the reference to Cameroon as Africa in miniature. This high degree of specie, genetic and ecosystem diversity is of significant socio-economic, scientific, and medicinal importance to its people. It underpins its economy, significantly contributing to the wellbeing of its people.
2) The recognition of the benefits of the goods and services offered by biodiversity has increasingly established the relationship and role of biodiversity in environmental sustainability, sustained economic growth and poverty alleviation. In facing the challenge today of eradicating poverty and promoting development in Cameroon, biodiversity remains crucial and its protection indispensable within the nations vision for growth and development.
3) Cameroon is party to the Convention on Biological Diversity which provides the framework for global action on biodiversity with the objective to ensure the conservation of biodiversity, the sustainable use of its components and the equitable sharing of its benefits. In compliance with its obligations under the provisions of the CBD, Cameroon in 1999 developed its first National Biodiversity Strategy and Action Plan (NBSAP) which was officially validated in 2000. The implementation of the NBSAP, 10 years after its validation was faced with the major challenge of evolving trends and emerging issues that rendered the 2000 NBSAP ill adapted as a strategic framework for intervention or response on biodiversity related issues. Of importance is Cameroon's 2035 vision for growth and development and its priority orientations defined within the Growth and Employment Strategy Paper (GESP) which provides development options to boost key production sectors that are largely dependent on biodiversity. The present document, the 2012 NBSAP II, is a revision and update of the 2000 NBSAP.

CURRENT STATE AND TRENDS OF BIODIVERSITY

4) NBSAP II maintains the ecosystem management approach and the identified six main ecosystem types in Cameroon: Coastal/Marine, Tropical Humid Dense Forest, Tropical Wooded Savannah, Semi-Arid, Montane and Fresh Water Ecosystems and highlights the current state of flora, fauna and microbial species and their habitats in each ecosystem.
5) In the hierarchy of norms, the protection of Cameroon's biodiversity is shaped by relevant international and regional instruments ratified by Cameroon, biodiversity related policies, laws and regulations. These instruments are an emanation of Constitutional mandate and orientation. An abundance of multilateral environmental agreements to which Cameroon is party have been of significance to biodiversity in providing the framework for international and regional cooperation. The current biodiversity policy and related legal instruments were informed by international rules and principles which have been translated in key policies for the environment.
6) Post 2000 has been an era of profound modification of the institutional landscape for biodiversity protection as relates to state and non-state actors. This includes the split in 2004 of the ex-Ministry of Environment and Forest (MINEF) to two separate entities: The Ministry of Environment and Protection of Nature (MINEP) charged with the coordination of the development and follow up of environmental policy and the Ministry of Forest and Wildlife charged with the development and implementation of the forest and wild life policies; The MINEPDED sector plan adopted in 2013 is made up of 4 intervention programs with Biodiversity as a key program, coordination structures and partnership agreements relevant for implementation of the biodiversity program.
7) Non State Actors such as Technical cooperation partners have made significant contributions through the support of biodiversity related national programs and projects, environment programs and other relevant sector programs as highlighted above. Bilateral support constitutes 75% of cooperation aid.Civil society organisations including NGOs intervening in biodiversity programs and projects have been on the increase carrying out sensitization, training and

evaluation. Their proximity with the local community have enabled them with a strong mobilization capacity of local and indigenous communities to ensure their involvement in biodiversity related activities.

8) The increasing awareness and involvement of private sector actors in biodiversity related programs has been obligated by the mandatory regulatory provisions for the carrying out of Environmental and Social Impact Assessments for major projects by promoters. This has been exacerbated by increase in controls and inspections to ensure respect for approved environmental management plans for private sector initiatives.

9) The current trend in biodiversity depicts Cameroon's biodiversity as among the most diverse in Africa in terms of variety, quantity, ecosystems and genetic resources, and with a high degree of endemism. Within the African Continent, Cameroon ranks fourth in floral richness and fifth in faunal diversity and represents 92% of Africa's ecosystems. Cameroon's rich biodiversity accommodates about: i) 8300 plant species; ii) 335 mammal species; iii) 848 bird species; iv) 542 fresh and brackish water fish species; v) 913 bird species (nearly half of the bird and mammal species of Africa are present in Cameroon forests; vi) Nearly half of the bird and mammal species of Africa are present in Cameroon forests.

10) The trend in protected areas depicts an increase in the creation of protected areas. There are 30 PAs created in Cameroon totalling 3.659 199,07ha. Between 2000 and 2012 protected areas have almost doubled from 17 to 30 depicting an increase of 76.5% The creation of protected production areas increased with a total of 72 Hunting zones.. Total area involved in wildlife conservation is 9,159,135 ha amounting to 19,25% of the national territory. Community forests also increased significantly during the period 2004 - 2011 by 301 sites (roughly 1 million ha).

11) There is however, a regressive trend of great concern: Cameroon's net annual deforestation rate is about 0.14 % (among the highest in the Congo Basin. 815 species of flowering plants are threatened; Cameroon ranks 18th in number of threatened mammals; Two species are listed in Annex 1 of CITES and Four species enlisted in Annex 2; Genetic diversity is progressively lost through uncontrolled crossbreeding.

CAUSES AND CONSEQUENCES OF BIODIVERISTY LOSS

12) This regressive trend is attributed to multiple causes with negative consequences for the environment and human wellbeing. This document highlights the causes and consequences of biodiversity loss, and establishes the link between biodiversity, development and wealth creation (poverty alleviation). Major direct and indirect causes of biodiversity loss are identified.

- Land-Use Change: In a system with an economy that depends on natural resources, the quest for land for agricultural development is one of the principal driving forces of biodiversity loss. Land use change have resulted from industrial agriculture with increasing conversion of forests, savannahs and even semi-arid lands to mono-culture plantations, unsustainable agricultural/pastoral expansion, mineral exploitation in biodiversity-rich locations, and the poor coordination or absence of the land use plans resulting in multiple conflicting uses by mining against logging concessions/farmers/conservation zones; grazing zones against agricultural land etc.
- The Unsustainable Exploitation of Natural Resources: includes overexploitation and the use of unsustainable practices constitute a major driver of biodiversity loss. Illegal exploitation of wildlife species and excessive poaching for food and commercial purposes is a threat to terrestrial and aquatic mammals and avifauna. Illegal exploitation of timber and exploitation in the informal sector for domestic markets, bio-piracy through research for development is increasingly of great concern with the illegal exploitation and transfer of plant/animal material and associated traditional knowledge.
- Pollution: Different sources and types of pollution contribute to the degradation of all ecosystems and loss of biodiversity. Identified are pollution from urban waste, agro-industrial waste, pollution from offshore and land based sources and air pollution.
- Climate Change: Climate change and climate variation are major sources of pressure on the health of ecosystems inducing changes with increasing negative impact on fragile ecosystems especially in the semi-arid, savannah, freshwater and marine/coastal

ecosystems. Increase in temperature and inversely drop in rainfall, river discharge and sea level rise.

- Introduction of non-native invasive species (invasive alien species). Which alter the abiotic environment and contribute to species extinctions in all ecosystems.
- Natural Disasters: The trend in the loss of biodiversity is exacerbated by recurrence of natural disasters such as floods and sedimentation which destroy aquatic life and impose sufferings on populations in the semi-arid and savannah ecosystems. Volcanic activity which destroy mountain and coastal biodiversity

13) Although most ecosystems are impacted by the general causes of biodiversity loss, specificities in characteristics, biodiversity resources and services offered subject each ecosystem to diverse activities with pressures of a specific nature resulting in loss of species and the degradation of the ecosystem.

- The marine and coastal ecosystem is increasingly under specific threats of pollution, mangrove destruction and fragmentation and coastal erosion which render the ecosystem more vulnerable.
- Deforestation is a direct cause of biodiversity loss and a major threat for the forest ecosystem.
- The major causes of biodiversity loss identified in theTropical Wooded Savannah Ecosystem are bushfires, overgrazing and unsustainable fuel wood harvesting.
- Disasters of Landslides and overharvesting constitute significant threats to biodiversity in the montane ecosystem.
- In the Semi-arid ecosystem of the northern regions are the devastating effects ofdroughts, desertification and floods which constitute a major source of pressure on the health of ecosystems with serious consequences on feeding and reproduction of species.
- Human demand on freshwater ecosystems which includes rivers, lakes, and wetlands (floodplains, seasonal swamps and marshes)has risen steeply over the past century, leading to large and growing threats of degradation of water catchment and riparian areas, eutrophication, and disruption of ecosystem functions.

14) The development options of the Growth and Employment Strategy Paper (GESP), is focused on rural development and industrialization driven by production sectors with large dependence on the ecosystems. The document recognizes the nation's natural resource potential as a natural asset to guarantee the realization of its growth vision and highlights this as an asset to underpin its intensive agriculture based on its varied ecosystems, capitalize on its energy potentials and mining resources. Forest, livestock and fisheries are related sectors of importance to its rural development goals. The document highlights activities that are unsustainable within each of these sectors and their negative impacts on biodiversity.

15) The socio- cultural environment of the nation presents serious challenges with regard to the use and management of the natural resources with indirect negative impacts on the ecosystems and their biodiversity components. Demographic pressureand the associated development in local populations directly affect resource use and drives habitat conversion in biodiversity hotspots with irreversible degradation of ecosystems. Migration and urbanisation with the given demographic trend exacerbate the pressure. Poverty affects 39.9% of the population with disparities in poverty trends and limited access to productive assets as one of the key drivers of biodiversity loss. Lack of awareness by the population is evident with the lack of an educational and other targeted awareness programs on biodiversity.

16) Ignorance has largely influenced the negative behavioural patterns and social practices that negatively impact the habitat and the resources on which they depend. The weak documentation and inaccessibility of decision makers to scientific information, the poor links between science and biodiversity policies also has indirect negative consequences on biodiversity.

17) The environment is one of the keys sectors where gender disparities has been identified with women largely excluded from land and natural resource ownership with a possession of only 1-7% of landed property. This constitutes a disincentive for the conservation and sustainable use of biodiversity by women who make up the larger part of the population.

18) Traditional knowledge (TK) is not fully valued and preserved rather TK is accessed and exploited for purposes of research and development and used, especially with respect to genetic resources, without the prior informed consent of the knowledge holders
19) The national policy and legal landscape for biodiversity protection has greatly evolved within the decade, but the impact in reversing the trend in biodiversity loss has been minimal. Although significant efforts have been invested in developing policies and adopting relevant legislation, the successful implementation of these instruments is greatly hampered by several constraining factors which constitute indirect drivers of biodiversity loss: Inadequate national compliance with multilateral environmental agreements, Inadequate sector integration, Inadequate and obsolete legislation, Non coherence and conflicts of key legislative instruments, weak enforcement.
20) Weakness in Institutional Response is characterized by weak co-ordination structures, inadequate funding of biodiversity as a critical handicap.
21) The inadequate funding for biodiversity activities constitutes a critical handicap and requires urgent action from all key stakeholders and cooperation of partners to reverse the trend and weak prioritization of biodiversity.

BIODIVERSITY STRATEGIC GOALS AND TARGETS

22) This document proposes a new policy orientation to reverse and halt the current trend in the loss of biodiversity as a way to establish a strong nature base that is indispensable for the growth of the nation's economy and a better livelihood of its people. The visionary direction envisages a great change in a little over two decades and allows for an end of term assessment with the national vision for growth and employment set for 2035.
23) The principles that underpin all biodiversity interventions and the strategic goals defined are adapted to realising this long term vision.
24) In compliance with Principle 10 of this document, setting the time frame for intervention seeks to be in coherence with both national and global processes. The time frame of 2020 for all targets is the preferred option and is compliant with the commitments made under the Convention on Biological Diversity and its 2011-2020 Strategic Plan and Aichi Targets for Biodiversity. It also ensures coherence in interventions with the national budget program approach set on a 3 yearly basis.
25) Cameroon's vision for biodiversity is defined as follows:
"By 2035, a sustainable relationship with biodiversity is established in its use and sharing of benefits to meet the development needs and well-being of the people, and ecosystem balance is preserved through sector and decentralized mainstreaming with the effective participation of all stakeholders including local communities".
26) The defined mission for 2020 is to "Take all necessary measures to reduce the rate of national biodiversity loss and ensure long-term sustainability of critical ecosystems in order to guarantee by 2020 the continuous contribution of biodiversity and other ecosystem services to wealth creation including through mainstreaming, capacity building and funding biodiversity that is driven by a strong partnership with the involvement of indigenous and local communities and a focus on gender as a guarantee for future generations".
27) Four strategic goals (areas for intervention) have been defined for the realisation of this mission.
    - Strategic Goal A is aimed at addressing the causes of biodiversity degradation/loss by reducing the direct and indirect pressures on biodiversity. This goal seeks to provide a response to the underlying direct and indirect causes of biodiversity loss relating to the lack of awareness and knowledge on the values and potentials of biodiversity, the weak import of science to inform decision making and production patterns, the demographic trend, urbanisation and poverty and the pressures from their increasing demands for biodiversity with unsustainable consumption and production patterns, and weaknesses in the policy and legal sphere.
    - Strategic Goal B is aimed at maintaining and improving the status of biodiversity by safeguarding ecosystems, habitats, species and genetic diversity and provides a response to the major consequences of human and natural pressures on the ecological environment relating to

the changes in landscapes and fragmentation of habitat that reduce the resilience of various ecosystems and disrupt ecosystem stability and functions.

- Strategic Goal C aims at promoting the sustainable utilization of biodiversity for wealth creation and contributing to poverty alleviation and thus provides the response to the human consequences of loss of biodiversity which constitute factors that compromise national development and include poverty, diseases, diverse conflicts, food insecurity, loss of household and national income and unemployment.
- Strategic Goal D seeks to promote the integration of biodiversity in sector and local level planning and development.

28) The four defined strategic goals for intervention provide a new orientation with clear guidance for the development of national targets and an action plan with priorities for biodiversity protection. Considering that challenges and opportunities for biodiversity protection are not uniform across ecosystems and sectors, the defined targets have also highlighted variations and specificities of its diverse ecosystems. It is within this framework that twenty (20) National Level Targets and ten (10) Ecosystem-specific Targets have been defined to ensure the effective realisation of the strategic goals.

29) In a systematic approach, priority actions have been identified for each target. The actions have also been translated into a matrix to enable an effective determination of the time frame for action, performance indicators and the actors/organisations responsible for the implementation.

BIODIVERSITY TARGETS

TARGET 1: By 2020 at least 80% of the population are aware of the importance of biodiversity with an increased knowledge on the link and impact of human activities on the major ecosystems.

TARGET 2: By 2020 significant increase in the contribution of scientifically-based information into biodiversity decision making processes and management interventions.

TARGET 3: By 2020, all forms of pollution from water and land-based activities are brought to levels that are non-detrimental to ecosystem functions.

TARGET 4: By 2020 an ecologically sustainable system of production and consumption is established based on sustainable practices with appropriate investments.

TARGET 5: By 2020 Biodiversity-related laws and regulations are strengthened and made coherent in order to avoid conflicting uses and combat illegal practices

TARGET 6: By 2020 the rate of degradation and fragmentation of ecosystems and the loss in habitats is significantly reduced at least by half.

TARGET 7 By 2020 endemic and threatened species of flora and fauna should be sustainably managed

TARGET 8: By 2020 re-establish and/or recover local extinct species in-situ and ex-situ and maintain a level of conservation that ensures long term sustainability

TARGET 9: By 2020 degraded ecosystems/habitats should be rehabilitated to re-establish and/or recover lost species and maintained at a level of conservation that ensures long-term sustainability.

TARGET 10: By 2020, the negative impacts of Climate Change and Climate Variation on ecosystems and human well-being are significantly reduced through ecosystem-based climate change adaptation measures.

TARGET 11 By 2020, at least 30% of the national territory, taking into consideration “ecosystem representativeness” is under effectively and equitably managed protected areas.

TARGET 12: By 2020, the genetic diversity of cultivated plants, domesticated animals, and their threatened wild relatives, including culturally valuable species, should be maintained and valorised

TARGET 13: By 2020 community-based biodiversity conservation and ecosystem management approaches should be promoted.

TARGET 14: By 2020 the development and implementation of a comprehensive program for the valuation of biodiversity should have been realised and payments for ecosystem services and goods imputed into the national budget for use in promoting sustainable biological and genetic resources programmes.

TARGET 15: By 2020, the establishment and implementation of mechanisms for the payments for ecosystem services, including carbon stocks, should generate increased revenue.

TARGET 16: By 2020, the sharing of benefits from payments for the sustainable utilisation of biodiversity, genetic resources and associated traditional knowledge should increase incomes of local communities.

TARGET 17: By 2020, biodiversity-related coordination mechanisms should be fully functional and strengthened

TARGET 18: By 2020, key production sectors and decentralised local authorities should have developed sector or region-specific biodiversity targets, linked to the national targets.

TARGET 19: By 2020, the capacity of key actors should be built and gender mainstreaming carried out for the effective implementation of the biodiversity targets

TARGET 20: By 2018, partnership support and funding of biodiversity programs should have increased

ECOSYSTEM SPECIFIC TARGETS

E-Target 1: By 2020, all sources of coastal and marine pollution should be effectively controlled to reduce pollution and mitigate its impact on the ecosystem.

E-Target 2: By 2020, mangrove forest and associated coastal forest degradation and loss should have been significantly reduced

E-Target 3: By 2020, Coastal Erosion should be greatly reduced and eroded coastal beaches rehabilitated.

E-Target 4: Develop and/or intensify integrated action frameworks on all activities (mining, industrial logging, smallholder agriculture, and illegal logging) that impact on forest biodiversity conservation, Protected Areas management in a manner that enhances local governance.

E-Target 5: By 2020 bushfire incidence should be reduced by at least 30%.

E-Target 6: By 2020 the use of alternative energy should have increased and significantly reduced pressure on fuel wood.

E-Target 7: By 2020, at least 50% of grazer populations have developed the capacity to reduce overgrazing

E-Target 8: By 2020 Increase by 20% and strengthen Community-Based Biodiversity Conservation and Management initiatives for endangered montane species.

E-Target 9: By 2020 at least 25% of sites degraded by droughts or floods are Rehabilitated within the semi-arid ecosystem.

E-Target 10: By 2020 wetlands of great significance should be under management plans and at least 10% of degraded fresh water catchment areas and riparian zones restored and protected.

MONITORING AND EVALUATION

30) The present NBSAP opts for a an implementation, monitoring and evaluation plan to be an important component from the early stage of its conception. This option has further allowed for an effective participation and contribution of local Communities, NGOs/Civil Societies and private sector in the design of the implementation, monitoring and evaluation plan.

31) The implementation mechanism gives the coordination responsibility to MINEPDED and the collaboration of Focal Points of key technical ministries of the production sector.To ensure this the National Biodiversity Committee, identified as a priority within this document, will be put in place and made operational to ensure the effective coordination and monitoring of progress on implementation. Regional focal points and other key actors are assigned defined roles. It provides for the development of key implementation tools

32) The monitoring and evaluation framework is presented in a table of matrix with defined performance criteria and SMART verifiable indicators to assess the level of implementation of the NBSAP with respect to each prescribed actions of set Targets within the adopted Strategic Goals.

33) Reporting on the progress of the implementation of the NBSAP will be periodic as defined and will ensure the generation of timely information for integration in national and relevant international processes.

CHAPTER I INTRODUCTION

1.1. THE VALUE OF BIODIVERSITY

Biological diversity or biodiversity is defined as "*the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" (Art 2 Convention on Biological Diversity)*Biodiversity as the ensemble of plant, animal and micro-organism life on earth with their diversity in species, genes including ecosystems offer great opportunities for human wellbeing and development in the world. Goods or natural resources provided by a diversity of species significantly contribute to food security and health essential for local livelihoods and largely underpin development of key production sectors. In addition, genetic diversity increases species resilience and adaptability to changing environmental conditions with opportunities for food security, medicine and development of industry while ecosystems in which biodiversity constantly interacts, offer provisioning services of carbon sequestration, plant pollination, watershed protection, enrichment and maintenance of soil fertility, breakdown of waste and pollutants which are essential for human survival.

Cameroon is endowed with a rich heritage of biodiversity and biological resources. The volcanic soils of the South West and Littoral regions and the maritime influence account for luxuriant vegetations which harbour highly diversified flora and fauna and support considerable agricultural, forestry and fishing activities. The beauty of the wild life and landscape of the north and extreme north regions are of high touristique value. The rich fauna and flora of the aquatic and tropical forests of the Centre, South and East plateauis an intact large mass for carbon sink and attracts the wood industry. From its rich natural heritate, Cameroon ranks fourth in floral diversity and fifth in faunal diversity within the African continent. Its diverse ecosystems are further representative of 92% of Africa's ecosystems resulting in the reference to Cameroon as *Africa in miniature*. *(UNEP 1997; MINEP 2008)*

The nation's biological and genetic resources constitute a bedrock for food security and health. In rural production for food and nutrition about 80% of the rural populations are engaged in biodiversity-driven activities on which their livelihoods depend. The medicinal properties of diverse plant and animal species provide enormous health benefits**.**It is estimated that 80% of the rural population in Cameroon depend on traditional medicine, a practice that has lasted for over a century and quite common to the Central and West African region. Inhabitants of biodiversity rich areas are endowed with indigenous knowledge associated with plants and animals.

Considerable research is underway to isolate the active ingredients from plants for use in the manufacture of drugs while national pharmaceutical industries based on plants are emerging. (*Institute of Medical and Medicinal Plant Research (IMPM) Yaounde, Baptist Health Board Mutengene*). National Biotechnology institutions are developing useful products using recombinant DNA techniques (antigens, vaccines, specific antibodies, etc) from genetic material. Extensive research in natural products is growing nationally though products and services from these are yet to be developed. Recent collaborations between traditional and western medicine highlight the importance of Cameroon's traditional knowledge and cultural practices in the identification and access of valuable genetic resources and the conservation of biodiversity.

The nation's biological diversity underpins its economy significantly contributing to the wellbeing of its people and particularly the rural population. GDP annual growth rate averaged 3.81% from 2003 until 2012 with a high of 5.70% in March 2012 *(NIH 2012).* Cameroons economy is commodity dependent. Although oil accounts for over 50% of total exports, agriculture accounts for 19.7% of the GDP (*IMF-World Economic Outlook 2012*) and employs more than 50% of the nation's workforce (NIH 2012). The high degree of specie, genetic and ecosystem diversity in Cameroon is of significant socio-economic, scientific, and medicinal importance to its people. Key economic sectors for national growth driven by biodiversity resources are agriculture, forestry, fisheries, livestock, and tourism.

The recognition of these direct and indirect benefits of the goods and services offered by biodiversity has increasingly established the relationship and role of biodiversity in environmental sustainability, sustained economic growth and poverty alleviation. In facing the challenge today of eradicating poverty and promoting development in Cameroon, biodiversity remains crucial and its protection indispensable within the nations vision for growth and development.

1.2. COMMITMENT TO GLOBAL RESPONSE ON BIODIVERSITY

Committed to protect its natural resource base, Cameroon is party to major international conventions that seek to provide a global response and approach to protecting the support system for life on earth.

Cameroon is party to the Convention on Biological Diversity which provides the framework for global action on biodiversity with the objective to ensure the conservation of biodiversity, the sustainable use of its components and the equitable sharing of benefits arising from the utilization of genetic resources. (Art.1 CBD) These objectives are held to extend the mandate of the CBD "*far beyond the conventional view of conservation and sustainable use, to encompass access to genetic resources, the use of genetic material and access to technology, including biotechnology*" (*Gerald Moor and Witold Tymowsky 2005*). The objectives further find emphasis in the two protocols to the CBD which seek to ensure an adequate level of protection in the safe movement and use of living modified organisms from biotechnology likely to adversely affect biodiversity (*Art. 1 Cartegena Protocol on Biosafety*) and to ensure a fair and equitable sharing of benefits from biodiversity. (*Art. 1 Nagoya Protocol on Access and Benefit Sharing)*

The CBD through its strategic approach to safeguard biodiversity and the benefits defined by the 2011-2020 Strategic Plan and its ambitious targets to reverse the trend of increasing loss to biodiversity today resulting from human and anthropogenic pressure provides a framework for Cameroon in concerted action with the global community to preserve its rich natural heritage and ensure that its people effectively benefit from this for their wellbeing.

Cameroons involvement in other global processes provides critical opportunities for the effective conservation, sustainable use and fair sharing of benefits from the nation's biodiversity. The ratification of several international instruments including the Convention on Climate Change, Convention on Desertification, Convention on International Trade in Endangered Species, Ramsar Convention etchas strengthened national commitment and interventions relevant in ensuring the protection of critical habitats and species. Recent interventions within the REDD+ process demonstrate the commitment to ensure that benefits from ecosystem services contribute to the well-being of the people.

A major resolution of the 2012 Rio+20 United Nations Summit on Sustainable Development reaffirms the importance of biodiversity for human well-being and its protection as an essential for the achievement of the Millennium Development Goals, including poverty reduction.

1.3. RATIONALE FOR REVISION OF NBSAP

In recognizing the critical role of national interventions to realizing its objectives and providing global benefits, the CBD obligates its members, acting in accordance with their particular conditions and capabilities, to develop national strategies, plans or programmes for the conservation and sustainable use of biodiversity or to adapt existing strategies, plans or programs in compliance with the provisions of the convention. *(Art 6a CBD*) Members are further obliged to integrate the priorities of the national strategies and plans on biodiversity into relevant sectoral policies and plans. (*Art, 6b CBD*)

It is in compliance with its obligations under these provisions of the CBD that Cameroon in 1999 developed its first National Biodiversity Strategy and Action Plan (NBSAP) which was officially validated in 2000. Conceived with the overall objective to implement the three objectives of the CBD, the 2000 NBSAP defines strategic goals to reduce and stop biodiversity loss, promote the value of biodiversity, undertake policy and legal reforms, and build capacity for planning and implementation.

The implementation of the NBSAP, 10 years after its validation is today faced with the major challenge of evolving trends and emerging issues that render the 2000 NBSAP ill adapted as a strategic framework for intervention or response on biodiversity related issues.

Of importance is Cameroon's 2035 vision for growth and development and its priority orientations defined within the Growth and Employment Strategy Paper (GESP) which provides development options to boost key production sectors that are largely dependent on biodiversity. This has generated an accelerated investment in major development projects that today present serious threats to biodiversity. The 2000 NBSAP can no longer provide an adequate response to these threats.

Furthermore are new emerging threats from the impact of climate change and biophysical changes coupled with socio-economic pressures that continue to have devastating effects on species and their habitats. Yet the current response measure within the 2000 NBSAP remains inadequate to stimulate the urgent and dynamic response required.

From a global perspective, the 2011-2020 Strategic Plan and the Aichi argets (*www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-en.pdf*) provide a new orientation and a more dynamic approach to attain the objectives of the CBD. The new vision of living in harmony with nature adopted by the CBD Strategic Plan proposes 20 global targets to be achieved by 2020 in order to address the underlying causes and drivers of biodiversity loss, human induced and natural pressures and the inequity in sharing benefits from biodiversity and ecosystem services. The 2000 NBSAP predates this global vision.

It is within this context that the Government decided to revise and update this important planning instrument for biodiversity. This response further ensure's the Governments compliance with Decision X/2 para 3c of the CBD COP which calls on parties to review and as appropriate update and revise NBSAPs.

1.4. SCOPE AND METHODOLOGY

1.4.1 SCOPE OF THE NBSAP

The present document is a revision and update of the 2000 NBSAP. It highlights the species, genetic and ecosystem trends and threats. In identifying the causes and consequences of the loss of biodiversity in this document, the link between biodiversity, development and poverty alleviation is clearly established. The NBSAP thus focuses on providing priorities to strengthen the current endeavours to bring about an accelerated development that is sustainable and minimizes the loss of biodiversity. For this purpose the document sets strategic goals and targets for 2020 to be taken into consideration within ecosystems and key production sector intervention actions. The cross sectoral scope is critical for the successful implementation of the revised NBSAP.

In ensuring compliance with national commitments to global conventions, the scope of the NBSAP goes beyond the CBD as it seeks to ensure synergy with the Rio Conventions, CMS, CITES and other biodiversity related Conventions.

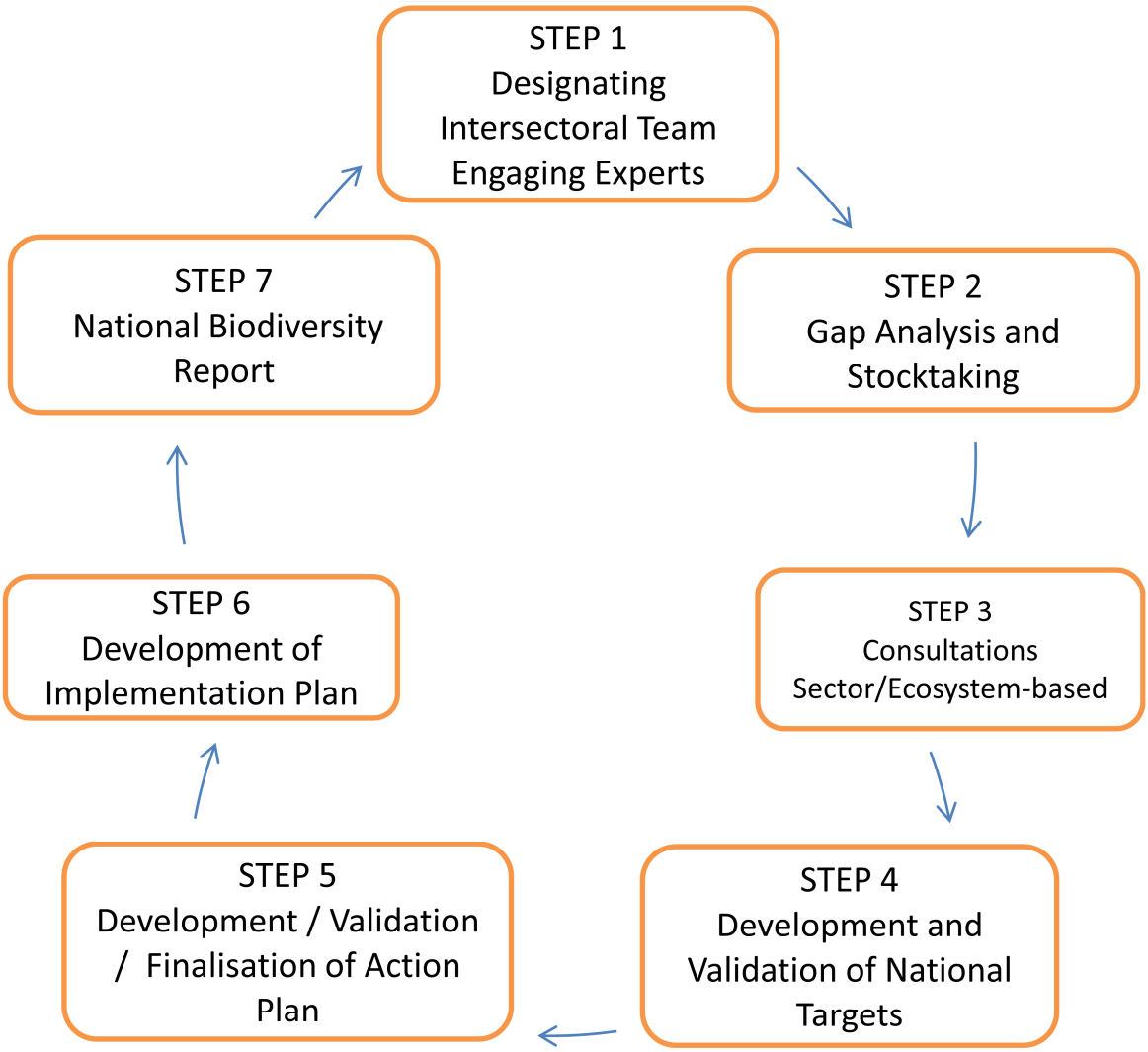
The present document provides an orientation for the subsequent development of a Capacity Development Plan; Communication, Education and Public Awareness Plan and a Resource Mobilization Plan for its implementation.

1.4.2 METHODOLOGY OF THE REVISION

The methodology for the revision and updating of the 2000 NBSAP substantially draws from the guidance of the Conference of Parties (COP) of the Convention on Biological Diversity in Decision IX/8. Inrecognizing national biodiversity strategies and action plans as key implementation tools of the Convention,the decisionprovides guidance to countries on the methodology for the revision of NBSAPs to:

- Include various stakeholders including amongst others indigenous and local communities

Box 1.1 NBSAP Revision Process



- Include relevant sectors that impact on and benefit from the use of biodiversity and its related ecosystem services;
- Develop flexible targets taking into account national priorities and capacities,
- Use revised NBSAPs for integration of biodiversity into national development planning processes and accounts, and
- Monitor NBSAPs using indicators.

In compliance with this guidance, the various phases in this process as highlighted in Box 1.1 were defined in the consultant terms of reference and respected in the revision process as explained below.

Phase 1: Setting the institutional stage for revision

The Ministry of Environment, Protection of Nature and Sustainable Development (MINEPDED) as the focal Institution of the CBD and the coordinating institution for biodiversity had the institutional mandate to lead the revision process. In collaboration with the CBD Focal Point, a MINEPDED technical follow up team was set up by an Order of the Minister. In view of the cross sectoral nature

in dealing with biodiversity issues, an inter-sectoral group of experts designated by Ministers directly in the use and management of biodiversity, was also put in place per the Order of the Minister and charged with providing the technical guidance for the revision of the NBSAP. The Team of experts of the Inter-Ministerial Advisory Committee are representatives drawn from the following Ministerial Departments:

- Representative of the Ministry of Environment, Protection of Nature and Sustainable Development,
- Representative of the Ministry of Forestry and Wild Life (MINFOF),
- Representative of the Ministry of Agriculture and Rural Development (MINADER),
- Representative of the Ministry of Livestock, Fisheries and Animal Industries (MINEPIA) and
- Representative of the Ministry of Scientific Research and Innovation – Institute of Agricultural Research for Development (MINRESI- IRAD),

The Inter-ministerial Committee met at regularly intervals to provide guidance and technical input for all studies carried out and documents developed within the process. During Advisory group meetings, other experts and members of civil society organisations contributing in the conduct of studies for the NBSAP were co-opted.

Phase 2: Country Study and Stocktaking

The process of carrying out country studies and stocktaking exercises for the revision of the NBSAP involved several desk studies and assessments with a highly consultative and participatory process that involved key stakeholders at various levels.

- *Desk Studies*

A consulting firm with a team of experts from diverse disciplines was contracted to lead the process. As an initial phase, several desk studies were carried out aimed at establishing the institutional map for biodiversity in Cameroon identifying key actors and their roles and responsibilities,*(MINEPDED 2012, Institutional Mapping for Biodiversity*) analyzing the policy, institutional, legal and strategic frameworks for biodiversity protection, establishing and analyzing the gaps between the 2000 NBSAP and the current situation (*MINEPDED 2012, Gap Analysis)* and identifying the causes, and consequences of biodiversity loss*(MINEPDED 2012, Causes and Consequences of Biodiversity Loss).* The studies were carried out with specific contribution from the NGO sector. Reports and findings from these studies carried out over a period of 4 months were subjected to the review and validation by the designated experts of the MINEPDED task force and the inter-ministerial advisory group.

It is important to highlight that the conduct of the gap analysis substantially drew from previous national initiatives carried out by Government and NGOs with the aim of revising the 2000 NBSAP. Of importance was the 2006 initial process by MINEPDED in carrying out a SWOT and Gap analysis of the NBSAP during a workshop that held in November 2006 in Kribi (*APREN/UNDP 2006*). Subsequent studies and initiatives aimed at gap analysis were carried (*Prip et al. 2010*).

Phase 3: Wide Consultations and Data Collection

- *Sector Consultations*

In a two-thronged process, sector based consultations were carried out as a first step. Experts of key ministries were consulted. Specific sector expert consultation meetings were held in key production ministries. Group and individual approaches were used to collect sector specific data based on sector specific guidelines developed by the consultants (*MINEPDED 2012, Report of Sector Consultations, revision of NBSAP*).

- *Ecosystem – based consultations and field assessments*

As a follow-up to these central level consultations, stakeholder consultation and field assessment workshops were organised, centered on an ecosystem–based approach. This approach was aimed at collecting data on the status of biodiversity, threats, existing responses, priority actions and strategies for remediation, but also at sensitizing stakeholders all over the national territory.
This consultation provided for wide nation coverage of all the 10 national Regions with a broad representation of all stakeholder groups. The consultations in each region brought together target regional government departments charged with the environment, forest and wild life resources, livestock, fisheries, agriculture, research, tourism, mines, economy and regional planning, water, commerce etc.. Non-Government stakeholders included decentralized local authorities, international and national NGOs, parliamentarians, private sector, media, women's groups, representatives of traditional healers associations and representatives of Indigenous peoples groups and CBOs.

Site selection for the workshops was based on the six identified ecosystems of Cameroon. However in cases where ecosystems were found to overlap across Regions and/or show vulnerability to similar environmental issues, consultation workshops for the concerned ecosystems were jointly organised.

Specifically, four stakeholder consultation workshops were carried out as follows:

- Consultations in the Coastal and Marine ecosystem: Organised in the coastal town of Kribi-South Region on the 24-25 May 2012, and brought together stakeholders from the Centre, Littoral and South-West Regions. (*MINEPDED 2012 Report of Workshop)* The consultation was organised back to back with the celebrations of the International Day of Biodiversity for 2012 with a focus on Marine Biodiversity. This provided a great opportunity during which the Minister of Environment, Protection of Nature and Sustainable Development officially launched the project for the revision of the NBSAP in the presence of several key political authorities and a large coastal community. A wide sensitization with field trips were carried out to highlight the value of marine biodiversity with a focus on women and the negative impact of human activities on marine biodiversity specifically mangroves and coastal beaches.
- Consultations in the Savannah and Montane ecosystems: Organised in Bali – Mezam on the 16 – 17th of August 2012 brought together stakeholders from the Northwest and West regions (*MINEP 2012 Report of Workshop).*
- Consultations in the Dense Humid Tropical Forest ecosystem: Organised in Yaounde on the 22 – 23rd of August 2012 brought together stakeholders from the Centre and East regions. (*MINEP 2012 Report of Workshop)*
- Consultations in the Semi-arid and Freshwater ecosystems in Maroua from the 27-28th of August brought together stakeholders from the Adamawa, Far North and North regions. (*MINEP 2012 Report of Workshop)*

The conduct of the workshops included presentations by identified resource persons, panel discussions, and brainstorming group work sessions oriented by guidelines developed specifically to match the peculiarities of each ecosystem under discussion and to generate information.

The data collected through this entire process was collated by the consultants in a report (*MINEPDED 2012 Consolidated data collection)* and subjected to the examination and validation of an extended Project Inter-ministerial advisory group.

Phase 4: Development and Validation of the National Biodiversity Goals and Targets

Conceiving the strategic goals and targets was guided by the need to fill the gabs identified during the desk and field assessments, and various sector and nation-wide consultation dialogues. The global orientation by the CBD Strategic Plan and its Aichi targets provided invaluable guidance.

A document on the National Biodiversity Targets was developed which defines a revised vision, introduces a new mission and a revised general principles for Cameroon's biodiversity. In this exercise, the strategic goals of NBSAP 1 were revised and a new set of targets proposed to ensure an effective realisation of the new vision and mission.

This document was again subject to review by the institutional organs charged with oversight and guidance and finally validated during a national stake-holders workshop in November 2012.

Phase 5Development and Validation of the National Action Plan

The validated national targets provided the framework for identifying priority actions based on the data collected from the sector and ecosystem-based consultation dialogues. The plan defines priority actions and time frames for intervention, performance indicators to monitor progress and key stakeholder institutions for implementation and concludes with an orientation for the implementation focused on identifying the criteria for monitoring and evaluation.

- *Validation Workshop*

The consolidated Biodiversity Targets, the proposed action plan and monitoring plan with indicators was presented by the consultants in a draft revised NBSAP. The revised draft was first examined by the inter-sectoral advisory group during a meeting and subsequently presented for validation on the 21st of December 2012 at a national validation workshop. The document was validated and a team set aside to work with the intersectoral advisory group to integrate comments made in the finalisation of the document by the experts.

- *Finalisation phase*

The finalisation phase of the NBSAP was highly significant in improving the quality of this document. Major comments made called for further expert input from CMS/CITES National focal points, experts in review of indicators proposed and other internal and external expert contributions.

CMS/CITES Target consultations: In specific compliance with Decision X/2 para 3 of the COP-CBD which calls for synergy of action amongst biodiversity related conventions in a manner consistent with their respective mandates and Decision XI/6 COP-CBD to incorporate the objectives of biodiversity related Conventions, a special process targeted at involving National CITES and CMS focal points was engaged. Capitalizing on the UNEP-WCMC capacity building workshop *(MINEPDED 2013, Report Capacity Building Workshop for Francophone Africa)* for the integration of CMS and CITES objectives in the updating of NBSAPs, several consultation sessions were organized with these key actors. Data collected during these sessions were invaluable in the process

Indicators meetings: Further capitalizing on several capacity building workshops, trained experts organised several national meetings to revise the draft indicators to integrate comments from the validation workshop. This process further benefited from the process of developing the 5th National Report for Biodiversity commenced alongside this phase

Expert inputs: Further contributions from internal and external experts and partner organisations during the development of the plan significantly enriched the revised strategy documentby filling in gaps highlighted during the validation workshop.

The consultants and an expert team meeting with the inter-ministerial advisory group then proceeded to validate the finalized document as NBSAP version II.

Phase 6 Development of Implementation Plan

A logical outcome of the validated NBSAP II is the development of a series of implementation plans necessary to operationalize the NBSAP II. These include the Capacity Needs Assessment Plan, CEPA Plan and a Resource Mobilization Plan. These plans are developed as annexed volumes to this document.

Phase 7 Preparation of the 5th National Report on Biodiversity

Reporting on the progress in implementation of the NBSAP constitutes a key phase in the nation's biodiversity planning as highlighted in the Monitoring and Evaluation Plan of both the first NBSAP and the present document. In compliance with these requirements and the obligations under the CBD, Cameroon has regularly prepared national reports and submitted same to the Secretariat of the SCBD. Within this process the preparation of the 5th National Report on Biodiversity was commenced during the finalization phase of the preparation of the NBSAP II and is expected to be finalized within the timeframe of March 2014 definedby the CBD.

1.4.3 STRUCTURE OF DOCUMENT

The revised NBSAP II is a six-chapter document.

The present Chapter 1 introduces the document by highlighting the importance of biodiversity to human wellbeing and the nation as the justification for giving attention to this important resource. It further highlights the nation's commitment to global processes that seek to protect biodiversity as a global heritage and concludes with the rationale for developing strategic planning frameworks and specifically for revising the first national strategy validated in 2000. It concludes with presenting the highly consultative and participatory approach that informed the revision process.

Chapter 2 is a highlight of the status of biodiversity which is the baseline from which the goals and targets for biodiversity conservation, the sustainable use of its components and the equitable sharing of the benefits from the exploitation of biodiversity has been established along with the indicators for verification. In maintaining the ecosystem approach adopted for biodiversity planning, it provides an overview for each of the six ecosystems with regard to their characterisation, species richness and endemism in flora and fauna, invasive species, protected areas and highlights biodiversity hotspots.

The trend in the loss of this rich biodiversity as a result of multiple natural and anthropogenic causes with ecosystem specificities and sector activities that constitute major drivers is presented in Chapter 3. In establishing the link of biodiversity to development, the chapter highlights the negative impacts of the digressive trend in biodiversity to ecological sustainability, livelihood and the national economy. The chapter concludes with identifying the current policy, legal, institutional and intervention response measures and their inadequacies to reverse the trend of increasing habitat degradation and loss of biodiversity.

As a way forward, Chapter 4 is focused on the revised vision, mission and guiding principles for an accelerated and more dynamic response to address the situation. The chapter presents four strategic goals, 20 achievable and measurable general biodiversity targets with ecosystem specific targets which provide a new orientation for intervention by the year 2020 in protecting biodiversity and ensuring its contribution to development

To attain the defined targets, Chapter 5 highlights the need for synergy with key national strategies and other Rio Conventions and presents the defined set of priority actions for the general targets and ecosystem-specific targets. Presented in a logical approach and within a matrix the priority actions have a defined time frame for action, an indicative framework for measuring performance and a set of stakeholders responsible for implementation.

Chapter 6 presents the conceived monitoring and evaluation framework and the principles, criteria and indicators as a key component for success in implementation, the existing structures to be used for its implementation and periodicity or milestone for measurement.

CHAPTER II
CURRENT STATE AND TRENDS OF BIODIVERSITY

The geophysical characteristics of Cameroon presented in this chapter highlight the great diversity in species and ecosystems. In maintaining the ecosystem approach adopted for biodiversity planning, the current state of the major ecosystem types are examined with regard to their characterisation, flora and fauna species, invasive species and biodiversity hotspots found in the ecosystem. The current legal and institutional framework for biodiversity as examined further depicts the extent of national response to protecting this rich biological heritage. Through this assessment, the current biodiversity trend is perceived with the 2000 NBSAP as a baseline.

2.1 LOCATION AND GEOPHYSICAL CHARACTERISTICS OF CAMEROON

Cameroon is located between Latitude 2° N to 13° N; Longitude 8° 25° E and 16° 20° W and found in Central Africa with a population of 19.401.000 million inhabitants (*BUCREP 2005*). It opens to the Atlantic Ocean in the West with a total coastline of 402 km. It is bounded to the west by Nigeria, north-east by Chad, south by Gabon, Congo and Equatorial Guinea and to the east by Central African Republic. From the Gulf of Guinea to Lake Chad, the country forms a triangle with a surface area of 475 650 km^2. (NIS 2012)

In terms of geo-physical features, Cameroon is characterised by:

i. Highlands: The western highlands which form the Cameroon range - a chain of mountain massifs orientating from the southwest to the north, i.e., from Mount Cameroon (4090m), the highest point in West and Central Africa to the Mandara mountains (2050m) with interspersing lowlands covers a large portion of the territory;
ii. Lowlands: The central-eastern lowlands;
iii. Plains: The coastal plains, river basins and the Lake Chad basin.

Three major climatic types follow the pattern of relief:

i The Equatorial climate in the south and the modified Cameroon type within the highlands moves up to 6^o N. Debundscha, located on the windward coastal side of Mount Cameroon is the second wettest area in the world with an annual rainfall of over 10 000mm.
ii The Sudano-sahelian climatic type characterizes the north of the country up to Lake Chad.
iii The humid tropical climate is a transition from 7^o to approx. 10^o N

The physical, biological and socioeconomic characteristics of the environment strongly influence land-use patterns and human behaviour within each ecosystem as defined below and consequently the habitats and species composition at any given time of assessment.

Table 2.1.: Land Use Pattern

Total area	2012	475 442	*km^2*
Density of population	2011	41.5	*persons per km^2*
Total area per 1000 population	2011	24.1	*km^2 per 1000 population*
Land area	2012	472 710	*km^2*
Land area per 1000 population	2011	24.0	*km^2 per 1000 population*
Land area (percentage of total area)	2011	99.4	*% of total area*
Water surface	2012	2 732	*km^2*
Water surface per 1000 population	2011	0.1	*km^2 per 1000 population*
Water surface (percentage of total area)	2011	0.6	*% of total area*
Agricultural land	2007	91 600	*km^2*
Agricultural land per 1000 population	2007	4.6	*km^2 per 1000 population*
Agricultural land (percentage of total area)	2007	19.3	*% of total area*
Agricultural land (percentage of land area)	2007	19.4	*% of land area*
Arable land	2007	59 600	*km^2*
Arable land per 1000 population	2007	3.0	*km^2 per 1000 population*
Arable land (percentage of total area)	2007	12.5	*% of total area*
Arable land (percentage of land area)	2007	12.6	*% of land area*
Arable land (percentage of agricultural land)	2007	65.1	*% of agricultural area*
Permanent crops	2007	12 000	*km^2*
Permanent crops per 1000 population	2007	0.6	*km^2 per 1000 population*
Permanent crops (percentage of total area)	2007	2.5	*% of total area*
Permanent crops (percentage of land area)	2007	2.5	*% of land area*
Permanent crops (percentage of agricultural land)	2007	13.1	*% of agricultural area*
Permanent meadows and pastures	2007	20 000	*km^2*
Permanent meadows and pastures per 1000 population	2007	1.0	*km^2 per 1000 population*
Permanent meadows and pastures (percentage of total area)	2007	4.2	*% of total area*
Permanent meadows and pastures (percentage of land area)	2007	4.2	*% of land area*
Permanent meadows and pastures (percentage of agricultural land)	2007	21.8	*% of agricultural area*
Forest area	2007	208 050	*km^2*
Forest area per 1000 population	2007	10.6	*km^2 per 1000 population*
Forest area (percentage of total area)	2007	43.8	*% of total area*
Forest area (percentage of land area)	2007	44.0	*% of land area*
Protected Areas	2012	2.682.407	*Ha*
Other land	2007	173 060	*km^2*
Other land per 1000 population	2007	8.8	*km^2 per 1000 population*
Other land (percentage of total area)	2007	36.4	*% of total area*
Other land (percentage of land area)	2007	36.6	*% of land area*

Source: http://en.worldstat.info/Asia/Cameroon/Land

2.2 MAIN ECOSYSTEMS

The adoption of the ecosystem approach as a strategy for managing its biological and genetic resources enables the nation to ensure compliance with the primary framework for action under the Convention on Biological Diversity (Art 2)). This approach recognizes that humans and their cultural diversity are an integral component of ecosystems.

2.2.1 ECOSYSTEM TYPES

The country has been divided into six main ecosystems: Marine and Coastal, Tropical Humid Dense Forest, Montane, Tropical Wooded Savannah, Freshwater and Semi-arid ecosystems (*UNEP/MINEF 1998*), taking into consideration the diversity in topography, vegetation and climatic conditions. See Box2. 1 and Table 2.2 below.

Box 2.1 Ecosystem Map

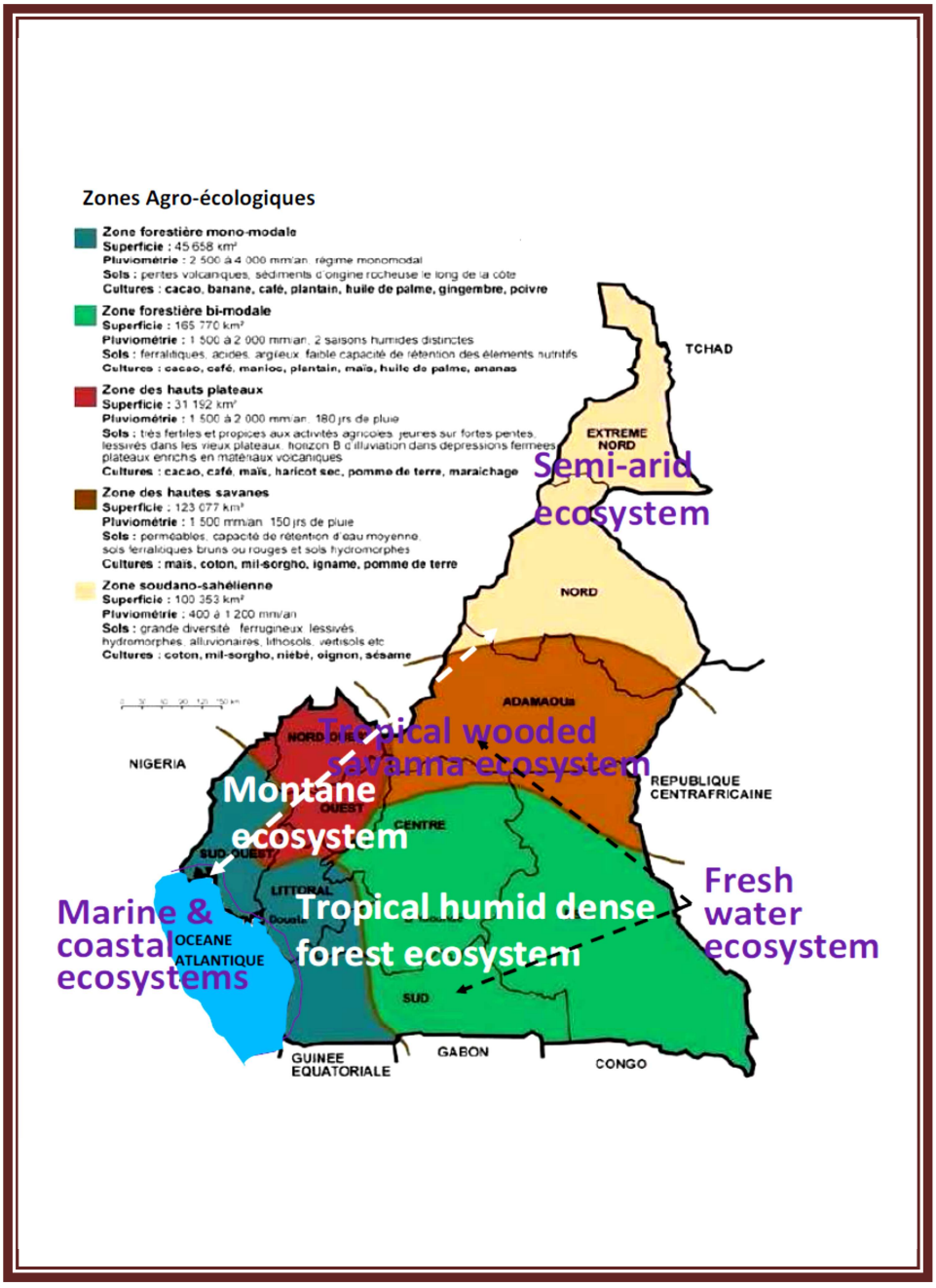


Table 2.2**: Main ecosystem types and their distribution in Cameroon**

Main Ecosystem type	**Major composition**	**Geographic Location**	**Administrative location**	**Climate**	**Soils**	**General description**
Marine/coastal	Continental shelf; Mangrove zone; Continental coast.	Some 402 km along the coast beginning from the Akwayafe river on the south eastern end of Nigeria, latitude 4°40' N and descends to the border with Equatorial Guinea at the River Campo, Latitude 2° 20' N. The ecosystem is between Longitudes 8°30' and 10°20' E. Covers an area of 9670 km^2	Ndian, Fako, Meme, Moungo, Sanaga maritime, Wouri & Ocean Divisions.	Warm and humid climate with annual water surface and air Temperatures averaging 24°C and 26.5° C, respectively. The area obeys a mono-modal rainfall pattern with an average of 3,500 mm per year with the exception of Debuncha which is at 11,000 mm /yr of rain.	Volcanic soils, while the clays have a colour ranging from grey to yellow. The beaches are sandy. The northern and central parts of the ecosystem lie on sedimentary soils.	Continental shelf :The northern section of the continental shelf is wide-25 nautical miles and 99% trawlable while the southern part is narrow.-15 nautical miles and 70% trawlable. Continental Coast: The northern and Central parts are dissected by rivers carrying large quantities of alluvial deposits and hence the prevalence of mangrove species. The coastal mount Cameroon slopes and the extreme south of the ecosystem lie on hard rocks, and hence little deposits and few mangroves
Tropical Humid Dense Forest	Littoral or Atlantic Humid Forest Biafran Forest; Guinea Congolian Forest Swamp/Flood Forest	Area situated between latitudes 2° and 6° 30' N, and longitudes 10° 20' & 16° 20'E	South west (tendency); Littoral; Centre; South and East Regions.	The rain fall obeys 2 patterns: Cameroonian; monomodal with more rain, and Guinean; bi-modal with less rain. Ex Douala = 4,028 mm, Yaoundé = 1,597 mm. mean annual temperatures are between 32°C & 23.5°C.	Volcanic in the West Granitic and Variously metamorphic	The Atlantic variant is made of 3 levels: tree, shrub and herbs, with a lot of *Lophira alata*. The Atlantic type gives way to the biafran and then to the mixed forest of *Gilberriodendron dewevrei* which further gives way to the sterculia subviolacea marsh and raffia swamp forest
Tropical Wooded Savannah ecosystem	Tree and woodland Savannah, Shrub savannah, Grassland savannah	Latitudes 5° and 8° 20' N and longitudes 9° 30' & 15° 40' E. Covers an area of 101992 km^2	North West; West and Adamawa Regions	The mean altitude is between 1.000 m and 1.600 m a.s.l. The average annual temperature is 19.4°C and the mean annual rainfall is 2.000 mm.	Volcanic in the Western half, granitic in the S/E Adamawa.	Tree and woodland savanna is found in the south and west of the ecosystem. Progressing to shrub savannah of *Daniella oblonga* and Lophira Ianceolata and then to grass savannah of imperata cylindricum and pennissetum purpureum.

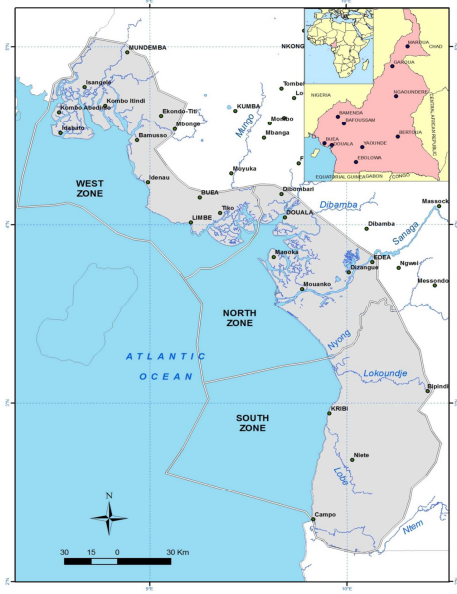
Montane	Subalpine or Ericaceous belt (3.00-4.000m a.s.l) Afromontane belt (1.600m-3.000m a.s.l) Submotane (1200-1600m)	The mountains are mostly located on the western half of the country's continental plate.	Southwest, West, Nothwest and Adamawa regions	Mountains are cooler their altitude eg Mt. Cameroon 4.095m has a temperature of 4) C but at Limbe (100masl . temperature is 32°C. soils are mainly volcanic.micro-climate is more humid.		The country's mountains are noted for volcanic activity. The most recent was in 1999 on Mt Cameroon. Some flora lichens and orchids strive on recent mountain larva.
Semi-arid	Steppe or large open land. Savannah and shrub land Prairie pastures Yaeres and Boves Flooded lands	Latitudes 8° 20'and 13° 10' N and longitudes 12° 30' and 15° 40' E. Covers an area of 102068 km^2	North and far North Regions.	The climate is severe with clear differences between the daytime and night-time temperatures. Maximum temperatures vary between 40 and 42°C: end April and the minimum temperature is 17°C: Dec/Jan. Rainfall drops from south: 1.00 mm to 900mm.to North: 900 to 400 mm per year.	The eastern plain lie on sedimentary soils. The Western soils are volcanic around the Mandara mountain and granitic north and south of the Mandara	Three major features include the Benoue plain in the South/East littered by small hills, the dry Mandara region and the flood vegetation on the west known as the Boves and Yaérés. A special and unique vegetation of thorny scrubland occurs in the Mozogo Gogoko reserve of the Mayo Tsanga Division. Characteristic activities include fishing in the eastern flood plains: February – April as the waters recede.
Fresh water	Limnogical (continental lakes) Lithological (continental rivers)	Rivers traverse several ecosystems due to the modification effect of water on microclimate and vegetation.	Several Regions			The lakes are classified in two categories namely: i) Craters or volcanic reservoirs; ii) Subsistence or lowland Lakes; iii) Basin Lakes i.e lake Chad; iv) Artificial Lakes i.e. Lagdo.

Source: Adapted from MINEP (2008)

2.2.2 MARINE AND COASTAL ECOSYSTEM

a) Characterisation

Box 2.2 Limits Coastal and Marine Environment



MINEP, 2010

Location. Cameroon shares the Atlantic coastline of about 402 km (*Sayer et al. 1992)* stretching from North with the border with Nigeria (4°40'N) to the south border with Equatorial Guinea (2°20'N) being located between 8°15' E et 9° 30' E.

Climate: As the rest of the Gulf of Guinea, the coastal climate of the Cameroon marine/coastal ecosystem is influenced by the meteorology of the equator which is the convergence of anticyclones of the Azores (North Atlantic) and St Helena (South Atlantic). Rainfall varies between 3000 mm and 4000 mm of water with 11 000 mm Debundscha flank of Mt Cameroon *(MINEF 1999 and Folack et al).* Temperatures are still high with an average above 25 ° C and wind speed ranges from 0.5 to 2 m/s.

Ocean currents: water temperature is around 24 ° C, this layer is thick warm water about 20 to 30m *(Crosnier, 1964)* according to the seasons or areas tides are semi-diurnal in general the amplitude varying from 0.3 to 3 m depending on the location. (*Morin et al. (1989);*

Geomorphology: The coverage radius of the Cameroon coast is about 10,600 square kilometers and has a gradual slope to 30, 50 to 100 m depth. *(Morin et al., 1989; Boye et al 1974)*

Hydrography: The particularity of the Cameroon coast is its intense hydrographic network composed of many rivers of which the most important are the Sanaga Wouri, Nyong, Mungo, Ndian, Meme, Lokoundjé, Ntem Kienke, Lobe, Cross River and many lakes that are sources of important continental inputs to the origin of many sandbars.

b) Biological Features

i Marine and coastal habitats

Sea grass and coral reefs: Little is known about sea grass diversity in Cameroon coasts but evidence shows that they are present;
Mangrove forests and other coastal wetlands: A variety of wetlands habitat types (coastal estuaries, lagoons, estuaries, rocky to sandy beaches, mudflats, tidal marshes, etc) characterize the coastline that flow from the hinterlands into the Atlantic Ocean. The confluences of these rivers with marine waters form suitable conditions for the development of outstanding giant mangrove vegetation in the region that also harbors the second largest tropical rainforests in the world. Mangroves are plant formationsof shelteredinter-tidal zonescomposed ofsclerophyllousevergreenbroadleaf treesstilt roots and pnematophores as adaptation to constantly muddy conditions. Mangrove ecosystems are extremely important coastal

wetlands formations, key in maintaining health of coastal fisheries. Most Cameroon mangroves are estuarine being located along them,. mouths of major rivers and may extend up to 20km along the rivers. Current covage of mangrove in Cameroon is about 200 000 ha. Plant species of varying morphologies characterize mangroves of the region, and are dominated by *Rhizophora racemosa* species that accounts for over 90% of mangrove forest attaining up to 50m in height with tree diameter of over 100cm around the Sanaga and Wouri estuaries marking one of the tallest mangroves in the world. (*Blasco et al, 1996 p.168*).

Coastal forests: These are formationsoflow and medium altitudesseasonally floodedwithspecies suchas*Lophiraalata* (Azobé) *Coulaedulis* (Hazel) *Saccoglottisgabonensis* (Bidou) About 20vegetation typesare identifiedat theKribi-coast Campo.This coastis hometo over1500 plant speciesdistributedin 640generaand 141families. These forests have been modified to secondary forests in many places by human activities creating various shades of agro-forests with expansion of agro-industries of large banana, palms and rubber plantations.

ii **Species of marine and coastal habitats**

The diversity of marine fish in Cameroon marine and coastal waters totals some 557 species, including 51 endemic species, 43 threatened, 59 reef associated, 131 pelagic, and 187 deep water. *(http://www.fishbase.org/).* 11 major fish families have been identified within Cameroon waters together with Shrimps, Cephalopods, Sharks and Rays of which two (Serranidae and Scombridae) are known to possess threatened fauna. *(Krakstad et al, 2006).* However, a total of 20 species have been documented as either vulnerable, endangered, near threatened, critically endangered or data deficient and likely to occur in Cameroon waters. *(www.IUCNREDList.org; FishBase http://www.fishbase.org/, Chiambeng, 2006.* These are listed in the table below with their common names and status.

Table 2.3: Sharks and other protected fish fauna likely to occur in the study area

Fish species	**Common Names**	**Status**
Family Rhincodontidae *Rhincodon typus* Smith, 1828	Whale shark	Vulnerable
- Family Lamnidae *Carcharodon carcharias* (Linnaeus, 1758) *Isurus oxyrinchus* Rafinesque, 1810	Mackerel sharks or white sharks	Vulnerable Near threatened
- Family Odontaspididae *Carcharias taurus* Rafinesque, 1810	Sand tigers	Vulnerable
Family Carchahinidae *Carcharhinus limbatus* (Muller & Henle, 1839)	Requiem sharks	Vulnerable
Family Centrophoridae *Centrophorus granulosus* (Bloch & Schneider, 1801)		Vulnerable
- Family Dalatiidae *Dalatias licha*(Bonnaterre, 1788)	Sleeper sharks	Data deficient
- Family Pristidae *Pristis microdon* Latham, 1794 *Pristis pectinata* Latham, 1794 *Pristis pristis* (Linnaeus, 1758)	Saw fishes	Endangered Endangered Critically Endangered
Family Myliobatidae *Aetobatus narinari* (Euphrasen, 1790)	Eagle and Manta rays	Data deficient
- Family Syngnathidae *Hippocampus hippocampus* (Linnaeus, 1758)	Pipefishes and Sea horses	vulnerable
Family Gobiidae *Bathygobius burtoni* (O' Shaughnessy, 1875)	(Gobies) known from Victoria	Data deficient
- Family Scombridae *Thunnus alalunga* (Bonnaterre, 1788) *Thunnus obessus* (Lowe, 1839)	Mackerels, Tunas	Data deficient Vulnerable
- Family Serranidae *Epinephelus itajara*(Geofrey St Hilaire, 1809) *Epinephelus marginatus* *Myctoroperca rubra*	Sea basses, Groupers Dusky Grouper Mottled grouper	Critically endangered Endangered Data defficient
Family Xanthidae *Xiphas glagius*	Sword fish	Data deficient
Family latimeridae *Latimera chalumnae.*	West Indian Ocean coelacanth	Critically Endangered

Cetaceans:

Some twenty four species have been documented herein as likely to occur with the Cameroon coast of which, 8 species have been identified in recent studies including IUCN listed Atlantic Hump-backed Dolphin *Sousa tseuzii* (vulnerable) and the Humpback.

Table 2.4 List of Cetaceans species identified together with those likely to occur in Cameroon waters and their IUCN status'

Scientific name	English Name	IUCN Status
Order Cetacea		
Family Delphinidae		
Stenella frontalis	Atlantic spotted Dolphin	Data Deficient
Stenella clymene	Atlantic spinner dolphin	Data Deficient
Sousa teuszii	Atlantic Hump-backed Dolphin	Vulnerable
Delphinus delphis	Atlantic Dolphin	Least Concern
Delphinus capensis	Long snouted common dolphin	Data Deficient
Tursiops truncates	Common bottle nose dolphin	Least Concern
Stenella coeruleo alba	Stripped dolphin	Least Concern
Grampus griseus	Risso's dolphin	Least Concern
Steno bredanensis	Rough-toughed dolphin	Least Concern
Stenella longirostris	Spinner dolphin	Data Deficient
Stenella atenuata	Pantropical spotted dolphin	Least Concern
Lagenodelphis hosei	Frasers dolphin	Least Concern
Pseudorca crassidens	False killer whale	Data Deficient
Orcinus orca	Killer whale	Data Deficient
Globicephala macrorhyncus	Short finned pilot whale	Data Deficient
Feresa attenuate	Pygmy killer whale	Data Deficient
Peponocephala electra	Melon-headed whale	Least Concern
Family Zipihiidae		
Mesoplodon europaeus	Gervais' white beaked whale	Data Deficient
Family Balaenopteridae		
Balaenoptera borealis	Sei Whale	Endangered
Balaenoptera physalus	Fin Whale	Endangered
Eubalaena glacialis	Atlantic Right Whale	Endangered
Megaptera novaeangliae	Humpback Whale	Vulnerable EN
Family Physeteridae		
Physeter macrocephalus	Large head Sperm Whale	Vulnerable
Family Phoeconidae		
Phoecoena phoecoena	Harbor purpoise	Least Concern

(IUCN –SSC: 2008); Ayissi et al.2011

African Manatee (marine and coastal mammal)

The African Manatee *Trichechus senegalensis* inhabits mangroves, rivers and some coastal waters throughout central Africa. In Cameroon the Manatees are found in suitable habitat from Korup on the Nigerian border, to the Edea region just north of the project area of influence (*Grigione 1996).* Manatees have not been recorded from the rivers and estuaries within and around the project area of influence.

Marine turtles:
A total of four species have been identified as occurring within the project zone and its environs. *Dermochelys coriacea, Lepidochelys olivacea, Chelonia mydas, and Eretmochelys imbricate* all of which are in the IUCN red list.

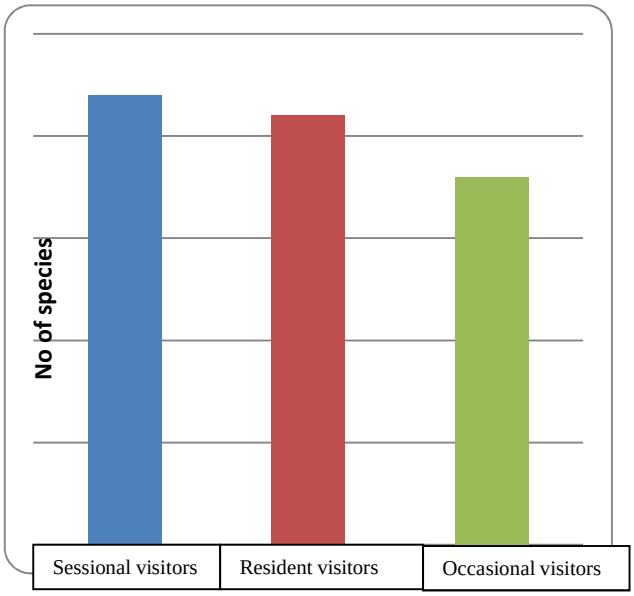
Table 2.5 Marine turtle species within Cameroon coast and their conservation status

Species	Common name	Conservation Status
Chelonia mydas	Atlantic Green turtle	Endangered
Eretmochelys imbricate	Hawksbill	Critically endangered
Dermochelys coriacea	Leatherback	Critically endangered
Lepidochelys olivacea	Olive Ridley	Vulnerable

(IUCN –SSC: 2008); Ayissi et al.2011

Migratory status of waterbird species within the coastal estuaries. Sixty-one (61) waterbird species represented in 17 families have so far been recorded Ajonina *et al*, 2003. The families Ardeidae, Scolopacidae, Charadriidae and Alcedinidae have the highest with 12, 10, 8 and 7 species respectively. The migratory status is also presented (see Figure 2.1below).

Figure 2.1: Migratory status of water birds along Cameroon coast (Douala-Edea)



Flora: Current taxonomic data show that wood and non-wood flora in Cameroon and the whole Atlantic coastline of the Gulf of the Guinea are populated by six (06) indigenous species and one introduced species, generally named by the generic term “palétuvier” (mangrove tree). Indigenous speciesare namely: *Rhizophora racemosa, Rhizophora harrisonii, Rhizophora mangle* (Rhizophoraceae), *Avicennia germinans* (Avicenniaceae), *Laguncularia racemosa, Conocarpus erecrus* (Combretaceae);and *Nypa fructicans* (Arecaceae) which is an introduced species. Vegetation is largely unevenly distributed over space because various species tend to proliferate on different micro-topographic configurations and different types of soil. *(Mbog,1999).*

In the majority of mangroves found across the country, there are particular dominant species; ranking first is the *Rhizophora racemosa*, followed by the *Avicennia germinaus* with 5%. *(Ajonina, 2008).* It is also important to note that the *Nypa fructicans*, an introduced indigenous species from Asia has been gaining considerable ground on the heels of the *Rhizophora*. The six (06) mangrove trees species generally share their habitat with more than 40 other plants known as « companion species» or “accidental species”.

Phytoplankton: Phytoplankton of theCameroonian coast is little known. There are 32 species that can be distributed into three classes: Bacilliophyceae, Dinophyceae and Cyanophyceae. The majority of species can be likened to those around Kribi area in the South and in Limbe area, (*Folack (1989) and Oben et al (2001))* in the West, respectively. These are also macrophytesseagrass, algae are abundantspeciesfixedon rocky surfaces.More than 29species of algae and170 species ofmarine plantshave been identified intheKribi-Campoarea.

Zooplankton: Information concerning the zooplankton found on the Cameroonian coastline is limited. Studies on mangrove vitality have so far numbered 24 zooplankton species distributed in six groups namely the Cladoceres, the Cyclopoida, the Calanoida, the Ostracodes, the Chaetognathes, and the Larvaceae.

Aquatic fauna: On the continental shelfofthe Cameroon coastis dividedaccording tothe nature of thesubstrat(sandy,muddy bottom) but also temperatureand salinity. There include: Species of warm desalinated water(surface waterdepth0-30m) Crustaceans; Speciesof the intermediate zone(zonethermocline)wherethe temperature drops andthe salinity increasesas one moves down(depth0-50m)Crustaceans,Annelids; Species of cold water living below the thermocline and can withstand high salinities molluscs (10 species), crustaceans, and invertebrates. To these can be added sponges, jellyfish, foraminifera, and many protozoa. Mangrove aquatic fauna are the most important category in terms of economical value and number of species. This fauna encompasses three main groups: aquatic mammals, reptiles, crustaceans, shellfish and fishes.

Aquatic mammals: The African manatee (*Trichechus senegalensis*) and otter are important aquatic mammals within the mangrove habitats and abundant in Douala-Edea Wildlife Reserve.

Aquatic Reptiles: Of the six speciesof sea turtlesfound inthe Atlantic,four frequent Cameroon waters, coastal shores, beaches and mangroves in search of food and nests.This include: the leatherback turtle (*Dermochelys coriacea*),olive ridley(*Lepidochelysolivacea* - Cholomidae), green turtle (*Cheloniamydas*-Cholomidae)and hawksbill(*Eretmochelysimbricate* - Chlomidae). Other sea turtle species also found include the leatherback turtle *(Dermochelys corialea*- Dermochelüdae) and the loggerhead sea turtle (*Carrella Carrella* – Cholomïdae). *(Ayissi et al, 2003).* Other aquatic reptiles include aquatic Najas (*Boulangerina annulata*), etc….

Aquatic Crustaceans: Crustacea can be found in all mangrove swamps and particularly abound at river mouths. Species most commonly found in Cameroon include the following: *Nematopalemon hastatus* (also called crayfish or njanga); this estuary crayfish is abundantly exploited by local communities through traditional fishing activities. *Penaeus kerathurus* or tiger crayfish, *Parapenaeopsis atlantica*, *Penaeus notialis*, and many other stocks of crabs can be found in mangroves, namely: *Ginossis pelii*, *Cardiosoma armatum*, *Geryon maritae*, *Panopeus africanus*, etc.*correct spellings please as above*

Aquatic Molluscs: The molluscs most typically found in Cameroon are oysters or gastropods. They are found in all Cameroonian mangroves; some of them are: *Pugilina morio*, *Thais coronata*, *Corbula trigona, Crassostrea gasar*, *Littorina angulifera*, *Loripes aberrans*, *Nassa argentea*, *Neritima adansoniana*, *Tagelus angulanus*, *Pachymeliana fuscatus*, *Pachymeliana aurita*, *Tais callifera*, *Melampus liberanus*, etc…

Fishes: The most frequently encountered species are: *Caranx hippos*, *Caranx spp*, *Trachinotus teraia*, *Tilapia* spp, *Pellonula afzeliusi*, *Arius gigas*, *Arius heudeloti*, *Arius parkii*, *Ethmalosa fimbriata*, *Sardinella maderensis*, *Plectorhynchus*, *Pomadasys* spp, *Mugil cephalus*, *Pseudotolithus* spp, *Dentex congoensis*, *Ilisha africana, Galeoides decadactylus, Polydactylus quadrifilis, Pomadasys jubelini,* etc…

iii Terrestrial Fauna

Terrestrial Reptiles: Regarding reptiles, crocodiles are found, including the long-snouted crocodile particularly hunted for its skin and flesh, dwarf crocodiles (*Osteolaemus tretraspis*), giant crocodiles (Crocodylia), Nile varans (*Varanus niloticus*), African pythons (*Pithon sebae*), etc. Other species of crocodiles found especially in the Kribi-Camposite are *Crocodiluscataphractus* and *Crocodilusniloticus*. With 122 species of reptiles, the Kribi-Campo area is a zone that is richest inreptilesin the world. The lizards are represented by *Rampholeum spectrum*, and *Chameleoquadricornis Chameleomontium*, the latter species is endemic to Mount Cameroon.Ophidians are represented by 150 species, including *Pithonsebae,Boulangerinaannulata, Bitis gabonica* and *Dendroaspisviridis*

Terrestrial Mammals: blue monkeys (Cercopithecideae) mangrove antelopes or Sitatunga (*Tragelaphus spekei*), aquatic Chevrotains (*Hyemoschus aquaticus*), bushpig (*Potamochoerus porcus*), Primates (chimpanzee, Drill,Mandrill, Gorilla, Monkey), Antelopes (Sitatunga)**,** forest elephant, leopard, Hippos, otters, etc.

Avifauna: Studies indicate that many birds live permanently in mangroves and other coastal wetland habitats which also provide temporary shelter for a host of endemic species. More than 70 species of aquatic birds visit the mangroves and the coastal shores every year *(Ajonina et al, 2003; Ajonina et al, 2004). Languyand Demey(2000),Anye(2002)* confirmed the presence of 302 species of birds on the coast of Kribi-Campo which according to the criteria of BirdLife International is classified as a priority area for the conservation of birds.A preliminary study during the months of January and March 2007,was used to estimate the effective water fow lanon-exhaustive 65 Palaearctic species and Afrotropical with a total of 18,326 individuals in 300 species.

Fish: The fresh water fish diversityalong the coast has been widely described. There are 27 families and232 speciesof which 18 are of economic importance, including. *Heterotisniloticus* and *Clarias*spp. *Chrysichthys*spp.*Mormyrus*spp, *Synodonti*s spp, *Labeo*sp*Brycinusmacrolepidotus*, *Lates niloticus)*. Recent researchin the area ofKribi-CampobyWorldfish Centerand IRD has described two new species of fish in the Chromaphyosemion group.

Amphibians: Among amphibians, there are more than 200 speciesof which 75are endemic toat least the coastal forest. Edeain the region, we encounter the Giant frogs are encountered in the region of Edea being the largest frog inthe world (*Conrua goliath*)whichcan measure up to30 cmand weighmore than 2.4kg.This species is also encountered in the region of Kribi-Campo alone that houses more than 80 species of amphibians.(Blanc, 2000).

iv Invasive species

Species composition and ecosystem processes in most coastal wetlands have changed in favour of invasive species especially Nypa palms (*Nypa fructicans*) a mangrove invasive palm originated from Asia and introduced in Nigeria in the 1990s. Today this has spread from mangrove zone of the Rio Del Rey Block progressively to Cameroon estuary and Ntem mangrove sites. The proliferation of water hyacinth (*Eichornia crassipes)* is very visible in aquatic coastal sites especially along rivers and lakes where they form very extensive mat that starve fishes from oxygen on the account of their high oxygen demands. They also reduce the penetration of light and reducing water surfaces and impairing water transportation and movements.

c) Biodiversity Hotspots

Major biodiversity hotspot is the Campo Ma'an National Park (264 064 ha).Forest and faunal reserves within the coastal ecosystem comprise the Dja Faunal Reserve and the Douala-EdeaWildlife Reserve.

Table 2.6: Protected Areas in the Marine & Coastal Ecosystem

Protected Areas types	Existing Protected Areas		Protected Areas proposed to be Gazetted	
	Number	Surface Areas (ha)	Number	Surface Areas (ha)
National parks	1	264 064	2	526 000
Marine parks	0		1	126 053
Forest/Wildlife Reserves	2	164 000		
Wildlife sanctuaries	0	0		
Botanical gardens	1	52		
Zoological gardens	1	0,5		
Total	10		3	652 053

Source: Kuete Fidele - Compiled from MINFOF documents (2012)

2.2.3 TROPICAL HUMID DENSE FOREST ECOSYSTEM

Assessment indicates that Cameroon's forest cover is 22 523 732 ha (*Dkamela, G.P. (2010)),* or 48% of the national territory (*de Wasseige et al. 2009*). The typology of the forestland, based on classes of land occupancy, features 2 major categories: dense forests and other forests. The coverage of dense forests is estimated at 16 876 143 ha; this is divided into lowland dense forests (16 467 570 ha), submontane forests (900–1500 m, 270 540 ha), montane forests (>1500 m, 17 685 ha), mangroves (120 348 ha) and swamp forests. Other plant formations in the forests are forest-cropland mosaics (4 501 395 ha), forest–savannah mosaics (5 867 865 ha), dense deciduous forests (105 984), cultivated land (4 873 077 ha), other land uses (towns, villages, industrial sites, etc.; 341 766 ha) and other plant formations (14 066 352 ha) (*de Wasseige et al. 2009).* Most of the biodiversity resources in Cameroon are found in the Forest Ecosytem, and therefore their preservation is essential for maintaining the richness of life on Earth

a) Characterization

The tropical humid dense forests make up the majority of Cameroon's forests and are estimated to cover 17 million ha. Two predominant types: Lowland evergreen (54% of total forest area) and lowland semi-deciduous (28%). Lowland evergreen divided into two (2) broad categories – Biafran forests forming an arc around the Gulf of Guinea and the Congo basin forests. Inland, the semi-evergreen lowland forests gives way to a mosaic of degraded forests and secondary savannah. Medium altitude closed semi-deciduous forests.

b) Biological Features

Most of the country's biodiversity is located in forested areas and the lower Guinean forest, which is renowned for its high number of endemic plant and animal species, is one of the country's key biodiversity hotspots.

State of flora

Available data indicates that the state of Cameroon flora is found in the Tropical Humid Forests ecosystem which is the most diverse and accounting for over 60% of the total biodiversity. Of the identified and named trees there are about 235 Families, 1179 Genera, 8500 – 10000 species, 411 Exotics, 808 Endemics, 3000 are Useful, 176 Endangered according to IUCN Redlist *(Onana, 2007),* and 11 Invasive species. In the forests ecosystem there are 650 trees, 850 shrubs, 750 Liana, 15 Ferns, 400 Orchids, and no information on Lichens. A checklist of eighty-six key species representing 35 plant families with their conservation status following the IUCN redlist categories. Close to 47 species, new to science have been discovered and described within this ecosystem in the last years following intensive botanical research. 27 of these newly discovered and described species are from Korup National Park and include; Achariaceae *Dasylepis thomasii (Obama & Breteler)*, Anacardiaceae *Trichoscypha* sp nov (*Obama & Breteler)*, Chrysobalanaceae *Magnistipula butayei* De Wild. subsp. *Korupensis (Burgt)*, Chrysobalanaceae *Magnistipula multinervia (Burgt)*, Combretaceae *Strephonema* sp nov?, Ebenaceae Diospyros korupensis Gosline, Clusiaciae-Guttiferae *Garcinia* sp nov? Leguminosae-Caes. *Anthonotha xanderi (Breteler)*, Leguminosae-Caes. *Berlinia korup (MacKinder & Burgt)*, Leguminosae-Caes. *Cryptosepalum* sp nov, Leguminosae-Caes. *Didelotia* sp nov? Leguminosae-Caes. *Englerodendron korupense (Burgt).* Leguminosae-Caes. *Gilbertiodendron newberyi* (*Burgt*) Leguminosae-Caes. *Hymenostegia* sp nov, Leguminosae-Caes. *Talbotiella korupesis (MacKinder & Wieringa)*, Leguminosae-Caes. *Talbotiella velutina (*Burgt & Wieringa), Leguminosae-Caes. *Tessmannia* sp nov (*Breteler)*, Melastomataceae *Warneckea austro-occidentalis* (*R.D. Stone n)*, Olacaceae *Diogoa retivenia* (*(S.Moore) Breteler)*, Rubiaceae *Gardenia epiphytica* Jongkind, Sapotaceae *Englerophytum* sp nov? Sapotaceae *Gluema korupensis (Burgt*) Sapotaceae *Lecomtedoxa plumose* (*Burgt)*, Sapotaceae *Manilkara lososiana* (*Kenfack & Ewango),* Sapotaceae *Synsepalum* sp nov. (*Kenfack & Ewango).*

Checklists for different forest types have been developed from detailed vegetation studies as follows: Checklist for South-western Cameroon with close to 497 species of trees; *(Thomas et al. 2003, Kenfack et al. 2007, Gartlan et al. 1997, Sunderland et al. 2004);* Checklist for Douala-Edea Forests with close to 450 species; *(Gartlan et al. 1996, CWCS 2000);* Checklist for the Nja Forests with about 380 species; *(Sonke et al. 2007);* Checklist for Campo-Maan forests; *(Tchouto 2000. WWF, Tropenbos);* Checklist for the Lobeke forests; *(Thomas et al. 2006);* Checklist orchids in Korup and Checklist for the Mbalmayo forests.

Plate 2.1:The Moabi Tree

Source: © John Nelson

Moabi trees are targeted by loggers

State of Fauna.

Cameroon is a zoological treasure trove and the diverse habitat hosts all the major species to be found throughout Africa and those that are reserved for the equatorial regions. The tropical Humid forest extraordinary habitat diversity supports 340 species of mammals, 920 species of birds and 274 reptiles (Reptile Atlas). Reptiles are well represented with a collection of snakes, lizards and the rivers are home to populations of crocodiles.

Most notable of forest inhabitants are the lowland and Cross River gorillas, chimpanzees, forest elephants, buffalos, and bongos with the following species considered endangered: Pohle's fruit bat, Black Rhinoceros, Pennat's red colobus, Preuss's guenon, Gorilla, drill, chimpanzee.

Table 2.7: Animal biodiversity in the Tropical Humid Dense forests

Category	Species No.	Species No Class A	Species No. Class B	No Endemic Species
Mammals	340	NA	5	All class A
Birds	920	1	NA	All class A
Reptiles	274	NA	NA	NA
Amphibians	200	NA	2	NA
Insects	1050	NA	NA	NA

Source: Culled from Gadsby and Jenkins (1992, Decoux et al. 1997 etc. WCS 2008

The Major groups of fauna include Primates and birds that are under immense threats. New species of fauna have also been described over the years

Table 2.8: State of Fauna Species in Cameroon

Species	Critically Endangered	Endangered	Vulnerable	Data defficient
Small and Large Mammals:	• Cross River Gorilla; • Chimpanzee; Forest Elephant.	• Red-capped; mangabey; • Drill, • Preuss's Guenon.	• Gaint Pangolin.	
Reptiles and Amphibians:		• Four-digit toad	• Dwarf Crocodile	• 2 species of Terrestrial tortoise
Avian Species:		• White-throated mountain babbler	• Grey-necked Pichathartes; • Bannerman's Weaver.	

Source: Compiled by Chuyong from IUCN Redlist assessments

A taxonomic checklist of Fauna species within the tropical forest ecosystem with their IUCN Redlist assessments (these species are included in Appendix II of the CITES Convention) is contained in this document.

c) Biodiversity Hotspots

Major hotspots include amongst others the Boumba Bek National Park (210 000 ha), Korup National Park (126 000 ha) Lobeke National Park (43 000 ha), Bakossi National Park (29 320 ha), Takamanda National Park (67 599 ha), Mpem et Djim (97 480 ha), Nki National Park (ha?), Mbam and Djerem National Park (4 234 78 sq km which overlaps the tropical forest and tropical savannah ecosystems), and the recent Deng Deng National Park (52 783 ha) created as a Biodiversity offset/compensation for the Lom Pangar Hydro-electricity Project.

There are a total of 89 PAs of all categories including Hunting Zonesand another 6 (264 075) proposed and being processed to be officially gazetted – see Table 2.9 below. However, the effective management of these PAs remains a challenge.

Table 2.9: Protected Areas in the Tropical Dense Humid Forest Ecosystem

Protected Areas types	Existing Protected Areas		Protected Areas proposed to be Gazetted	
	Number	Surface Areas (ha)	Number	Surface Areas (ha)
National parks	11	1 766 345.93	2	168 900
Wildlife Reserves	1	526 000		
Wildlife sanctuaries	1	93 723	3	93 375
Zoological gardens	1	4.7	1	1800
Floral sanctuaries	1	1000		
Hunting zones	48	4 159 69		
Community hunting zones	26	1 535 158		
Total	89	3 926 391.32	6	264 075

Source: Kuete Fidele - Compiled from MINFOF documents (2012)

2.2.4 TROPICAL WOODED SAVANNAH ECOSYSTEM

a) Characterization

The tropical wooded savannah ecosystem is found mainly in the Adamawa, North West and West regions, between latitudes 5° and 8° 20’ N, longitudes 9° 30’and 15° 40’ E. The vegetation is constituted of tree and woodland savannah in the south and west of the ecosystem, turning progressively to shrub savannah of *Daniella oliveri; Piliostigma tonningii* and *Lophira lanceolata* and then to grasslqnd savannah of *Imperata cylindrica; Hyparrhenia sp* and *Pennissetum purpureum* interspersed with forest galleries along river banks. Average altitude lies around 1.000 m to 1.600 m above sea level. The average annual temperature is 19.4°C and the mean annual rainfall is 2000mm. There is a variety of soils, from volcanic (western area), to granitic and/or ferralitic (South west Adamawa). This ecosystem is irrigated by a wide range of rivers that feed the Sanaga (Mbam, Noun, Lom, Djerem, Vina, etc.), Niger (Benoue) and Lake Chad (Vina North) Basins. Due to its volcanic nature, it contains a lot of crater lakes (Nyos, Tyson, Baledjam, etc. Details on these lakes are treated under the Freshwater Ecosystem.

b) **Biological features**

State of flora

The following economic species exist within the Savannah Ecosystem:

i. Woody plants and shrubs (*Daniella oliveri, Lophira lanceolata, Anogeissus leicarpus, Uapaca togoensis, Eucalyptus spp.; Pinus spp; cola spp; Garcina lucida, Zanthoxylum lepieuri, Terminalia glaucoscens,* etc.);
ii. Herbaceous plants (*Andropogon spp; Hyperrhenia diplandra, Panicum phragmitoides, Imperata cyclindricum, Afromomum spp; Stylosanthes spp.* (local and exotic), *Brachiaria spp; Pennisetum spp.*, etc);
iii. Cultivated plants (food or cash crops):Maize (several varieties, new and old), Rice (several varieties with Nerica as new introduction), Beans (several varieties, new and old), Ground nuts (several varieties), Cassava (several varieties), Yams (several varieties)Potatoes (Irish)(several varieties), Sweet potatoes, Plantains(several varieties), Bananas(several varieties), Vegetables (very diverse), cola nuts, plums, etc.;
iv. Within Agroforestry, species are chosen by farmers based on their needs for various usages, – e.g., shade trees, browse trees (livestock feeding), gum Arabic, etc. Some Jatropha spp. have been introduced from Mali for possible exploitation for biofuel. *(ANAFOR).*

State of fauna

i. Wild mammals**:**Grassland species, some rare species (Hyena, West African Golden cat (*Profelis aurata*), buffalo (*Syncerus spp*.) and most of the species in the forest ecosystem (e.g. various primates(baboons, monkeys), antelopes, cats (lions, leopards), cane rats, porcupines, etc);
ii. Domesticated mammals: Cattle (Bos indicus) – Gudali, (3 varieties: Ngaoundere, Banyo and Yola) - these are endemic; Red Fulani and White Fulani; Cattle (Bos taurus): local (Namchi) and exotic breeds/blood –Holstein, Montbeliard, Brahman, etc., introduced for crossbreeding/genetic improvement (dairy and beef production);The diversity (genetic) of the cattle breeds is still high despite the fact that none is pure. The B. indicus carries some B. taurus blood which carries some B. indicus blood as well.*(Carl Jann et al, 2004; Ibeagha-Awemu and Erhardt, 2006; Ibeagha et al, 2004).* The diversity is still high and useful for genetic improvement;
iii. Small ruminants: Grassland Dwarf Sheep (Djallonke, Peuhl/Fulbe), Exotic (Dorset, Katadin, Suffolk), Grassland Dwarf Goat, Exotic (Saanen, Toggenburg, Nubian); Pigs, Rabbits, Horses and Donkeys; Non-conventional livestock;
iv. Non-conventional livestock breeding including "Cane rat" (cutting grass) has been introduced in the West and Northwest section of the ecosystem.

Avian species

There are 437 bird species *(Decoux et al, 1997)* of which 379 are resident and 58 are migratory. The Bamenda apalis (*Apalis bamendae*) is endemic and vulnerable. Important levels of genetic diversity of local chickens as well as introgresion are reported (*Fotsa et al (2011)*. There are regional differences in levels of exotic blood (higher in East and Centre – commercial flocks, than in Northwest and West).

Insects

Numerous ground insects, hoppers, butterflies, termites and fungi are of agricultural and food security importance. These include bees (honey production in Adamawa and Northwest regions), winged termites and green locusts, beetle larvae and mushrooms.

There are also insect invaders that threaten agricultural production and food security, e.g., the Cassava Root Mealybug, Cassava Shoot Mealybug, Mango Mealybug, etc.

Invasive species (native and non-native): i)African swine fever virus (ASFV), Foot and Mouth Disease Virus (FMDV), Bird Flu Virus, etc.; ii) Striga spp., Cassava root scale (Mealybug), Cassava shoot mealybug, mango mealybug, Cocoyam root rot, Cocoyam leaf rot, etc.; iii) Bracken ferm (*Pteridium* spp.), *Chromolaena odorata, Mimosa spp., Imperata spp*

Other Species in: i)Freshwater fish and crustaceans; ii) Amphibians; iii) Ophidians and reptiles; iv) Various micro-organisms are known to exist but adequate data/information is not available on these species, except on some biological invasions and fungi.

c) Biodiversity Hotspots

Major biodiversity hotspots include the Vallee du Mbere National Park (77 760 ha)

Meso-hotspots in the ecosystem (Bali – Ngemba Forest Reserve, Ijim Ridge and Mt. Oku, in which there are between 50 – 100 threatened species) and there are moderately dense Micro-hotspots in the high plateau parts of the ecosystem (Northwest and Adamawa Regions) in which less that 50 species are reported threatened*. (Onana and Cheek, 2011).*

Table 2.10: Protected Areas in the Tropical Wooded Savannah Ecosystem

Protected Areas types	Existing Protected Areas		Protected Areas proposed to be Gazetted	
	Number	Surface Areas (ha)	Number	Surface Areas (ha)
National parks	4	807 760		
Forest/wildlife Reserves	3			
Wildlife Sanctuaries				
Zoological gardens	1	1,5		
Hunting zones	27	2 438 002		
Community hunting zones	6	398 087		58 359
Total	**38**	**3 643 850.50**	**1**	**58 359**

Source: Kuete Fidele - Compiled from MINFOF documents (2012)

2.2.5 MONTANE ECOSYSTEM

a) Characterization

Location: Montane ecosystem is located within parent ecosystems (marine and coastal, tropical humid dense forest, tropical wooded savannah). There are a total of 28 mountains in Cameroon, which in general are, located on the Western half of the country's continental plate.

Characteristics: i) each mountain, given its altitude, constitutes a complex of ecosystems within an ecosystem (2 within marine and coastal, 5 within tropical humid dense forest, 21 within tropical wooded savannah); ii) each is different in soils, vegetation and climate relative to the parent ecosystem

Physical Components.Each can fall within one or more of:

- Submontane (1,200 – 1,600m) with more humid micro-climate and lower temperatures than the parent ecosystem. The annual thermal amplitude is lower than for the parent ecosystem.
- Afromotane (1,600 – 3,000m) with volcanic soils and its own climate lichens and orchids strive on larva.
- Subalpine (3,000 – 4,000m) that is much cooler and volcanic.

b) Biological features

State of flora

- **Wild plants:** Various studies (Letouzey (1985), Cheek (1992), Tchouto L (1996) and Onana and Cheek (2011)) present the flora of montane ecosystem as most diverse, given varions altitudes with their micro-climates. Different vegetation types (and the plants therein) are associated with submontane forest (800 – 1,600m), montane forest (1,600 – 1,800m), montane scrub (1,800 – 2,400m), montane grassland (2,000 – 3,000m) and subalpine (3,000 – 4,000m). The highest diversity of species per degree square in Tropical Africa is found here. (Taxa/Km²: Mt. Cameroon area: 0.90, Kupe-Manengumba-Bakossi: 1.01, Mt. Oku and Ijim Ridge: 0.59, Korup. Forest: 0.67) (*Cheek et al(Eds), 2004*), Red Data Taxa of Kupe, Mwaneguba and Bakossi Mountains, Cameroon)(Plants of Kupe Mwanenguba and the Bakossi Mountains) (eds). (*Cheek M., Pollard B.J., Dasbgshire I., Onana J.N., and Wild C)*
- Most species-diverse centres (>2300 species) of plant diversity in Tropical Africa include Mt. Cameroon*(Cable and Cheek, 1998)* and Kupe-Bakossi (*Cheek et al., 2004*).
- Two (2) of the cells with >100 species are on the slopes of Mt. Cameroon A similar listing is made of the 22 Red Data Species of Dom in Oku on the Bamenda Highlands.

Discoveries of new species were made, mostly after 2000, in the montane ecosystem among which are: Coffea bakossi,(*Goshire 1999)* Coffea montekupensis *(Cheek 1998)* Myrianthus fosi,*(Cheek et al, 2004)* among the 5-16 discoveries per year*(MINEP:2008)* (2002: 16 species; 2003: 12 species; 2004: 9 species; 2005: 8 species; 2006: 5 species).

A Red Data plant species (status) was established for the Lebialem Highlands with the result that out of a total of forty two (42) plant species, eleven (11) are endangered, two (2) are Critically Endangered and 29 are vulnerable (*Harvey Y, Tchiengué and Cheek M, 2010*)

Table 2.11: Red Data Plant Species of Lebialem Highlands

Family	Species	Endangered	Critically Endangered	Vulnerable
Acanthaceae	*Brachystephanus giganteus*			XX
Anonaceae	*Xylopia Africana*			XX
Araliaceae	*Schefflera hierniana*			XX
Balsaminaceae	*Impatiens letouzeyi*	XX		
	Impatiens sakeriana			XX
Begoniaceae	*Begonia adpressa*			XX
	Begonia axyanthera			XX
	Begonia preussii			XX
	Begonia pseudoviola			XX
	Begonia schaeferi			XX
Cecropiaceae	*Myrianthus fosi*			XX
Celastraceae	*Salacia lebrunii*			XX
	Salacia lehmbachii			XX
Chrysobalanaceae	*Magnistipula conrauna*	XX		
Euphorbiaceae	*Pseudagrostistachys africana*			XX
Gutttiferae	*Allanblackia gabonensis*			XX

	Psorospermum aurantiacum			XX
Icacinaceae	*Pyrenacantha longirostrata*	XX		
Labiatae	*Plectrantus punctatus*			XX
Lecythidaceae	*Napoleonaea egetonii*			XX
Loganiaceae	*Anthocleista scandens*			XX
Melastomataceae	*Cincinnobotrys letouzeyi*	XX		
	Dissotis bamendae			XX
Meliaceae	*Heckeldora ledermannii*	XX		
Rubiaceae	*Argocoffeopsis fosimondi*		XX	
	Chassalia laikomensis		XX	
	Coffea montekupensis			XX
	Pavetta brachycalyx	XX		
	Pavetta hookeriana			XX
	Psychotria babatwoensis	XX		
	Sabicea xanthotricha			XX
	Trichostachys petiolata	XX		
Sapindaceae	*Allophyllus bullatus*			XX
	Allophyllus conraui	XX		
	Deinbollia oreophila			XX
Simaroubaceae	*Quassia sanguinea*			XX
Sterculiaceae	*Leptonychia kamerunensis*	XX		
Commelinaceae	*Aneilema silvaticum*			XX
Orchidaceae	*Bulbophyllum nigericum*			XX
	Cyrtorchis letouzeyi	XX		
	Diaphananthe bueae			XX
	Polystacha bicalcarata			XX
TOTALS		**11**	**2**	**29**

Source: Harvey Y, Tchiengué and Cheek M , (2010)

State of Fauna

(i) Avian species.

Decoux et al (1997) reported 392 bird species at the time in the Montane ecosystem of which:

- 256 are residents, 36 migratory and 48 endemic.
- Seven (7) are endangered: Bannerman's Turaco, Banded Wattle Eye, White throated Mountain Babbler, Mount Kupe Bush-shrike, Bannerman's Weaver and Mount Cameroon speirops (Speirops melanocephalus).
- Wildlife International (1998) classified Mount Cameroon as one of the World's endemic Areas with high numbers of endemic species (29 species) of birds.
- The montaine ecosystem, with its diversity of habitat types, is home to many bird species in Cameroon. (*Borrow N., Damey. R. 2001).*

Some of these birds are very threatened given the loss of habitat north of the Bamenda highlands and the slopes of Mt Cameroon. Overall, 15 species are classified as threatened (*Vie et al, 2009*).

For domestic birds, Fotsa et al (2011) reports the diversity, introgression and regional differences in exotic blood levels.

(ii) Reptiles and amphibians: Most of the information on reptile and amphibian species is available from Kilum-Ijim montane forest (7 Amphibian species: *Xenpus spp., Crotaphatrema lamoltei, Astylosemus ranoides, Wolterstorfinna mirei, Leptodactylodon perreti*, Phrynobatrachus steindacheri, Cardioglossa oreas, and 6 Reptile species: *Chamaeleo quadricornis gracilior, Chamaeleo wiedersheimi weidersheimi, Panaspis chriswildii, Panaspis viginitisererum, Thrasops flavigularis, Dipsadaboa spp.*)Vie et al (2009) reports that 53 threatened amphibians nationwide. The loss in forest habitat is a threat to amphibians.umerous species of snakes, pangolines, lizards may exist in the ecosystem.
WCMC (1993) indicates the presence of an endemic chameleon, *Chameleo eisentrauti* and a very localised toad, *Werneria tandyi* in the Rumpi Hills. The same report mentions the presence of other toads (*Didynamipus sjoestedti* and *Werneria preussi*) and a rare tree Frog *Hyperolius Krebsi* on Mt. Cameroon.

The study also reports existence of many endemic species of chameleons, toads/frogs and other reptiles on other montane systems in the country (3 endemic Anuran species (*Cardioglosa trifasciata, Phrynodon spp.* and *Leptodactylodon erythrogaster*)

(iii) Insects: The montane ecosystem is rich in insects: Termites, Ground hoppers, Myriapods centipides and milipides, Arachnida (tarantullas and spiders), *Apis mellifa* (honey bee, etc) with termites and honey bees contributing significantly to food security.

(iv) Invasive species (native and non-native): African swine fever, Foot-and-mouth disease, Bird Flu, Cassava root scale, cassava shoot, mealybug, mango mealybug, Bracken fern (Pteridium spp.)

(v) Microorganisms: A variable complex of ecosystems, the montane ecosystem certainly has its microorganisms. Not much information is available on species presence/abundance.
However, ASFV, FMDV, and newly discovered fungus, *Aphelariopsis Kupemontis*: a new auricularoid species from Cameroon, Personia 17: 491-493. *Aphelariopots kupemontis* (Roberts P., 2001).

c) Biodiversity Hotspots

Macro hotspots: >100 threatened species: Four in the Southwest Region; 2 cells on the lower slopes of Mt. Cameroon, 2 cells on Mt. Kupe-Bakossi. Protected areas include the Mount Cameroon National Park (58 178 ha)
Meso-Hotspots: There are about 50-100 threatened species: Five in the Southwest Region; Bimbia-Bonadikombo (eastern foothills of Mt. Cameroon), Lake Barombi Mbo (Kumba) and southern Bakundu Forest Reserve (north eastern outliers of Mt. Cameroon), Mokoko Forest Reserve (north eastern outliers of Mt. Cameroon), West Bakossi North, West Bakossi South

Table 2.12: Protected Areas in the Montane Ecosystem

Protected Areas types	Existing Protected Areas		Protected Areas proposed to be Gazetted	
	Number	Surface Areas (ha)	Number	Surface Areas (ha)
National parks	1	58 178	1	150 000
Wildlife Reserves	3	12 995	1	2 500
Wildlife sanctuaries	1	1 944		
Integral ecological reserve			3	12 428
Floral sanctuaries	1	1000		
Total	**5**	**74 117**	**5**	**164 928**

Source: Kuete Fidele - Compiled from MINFOF documents (2012)

2.2.6 SEMI-ARID ECOSYSTEM

a) Characterization

The semiarid ecosystem stretches between latitudes 8°20'and 13° 10' N, and longitudes 12°30' and 15° 40' E. It covers two administrative regions, namely the Far North and North. The vegetation is constituted mainly of steppes or large open land, wooded savannah, shrub land, prairie pastures, Yaeres (flooded lands) and Boves. It is characterised by two main climates from the south to the north: sudanian (rainfalls of 900 - 1000mm, 4 to 5 months of rains vs 7 to 8 months of dry season) and sudano-sahelian (400 - 900mm, 7 to 9 months of dry season). Average temperatures range from 17°C (December) to 40-42°C (April-May). The relief comprises mountains (Poli, Alantik a and Mandara mountain ranges, Roumsiki and Mindif peaks, etc.), flooded areas; plains and valleys. The eastern plain lies on sedimentary soils while the western soils are volcanic around the Mandara mountain, and granitic north and south of the Mandara. Many permanent as well as semi-permanent rivers (Logone, Benoue, Mayo Kaliao, M. Louti, M. Sava, etc.), natural (Lake Chad) as well as artificial (Lagdo, Maga, Guere, etc.) lakes, dams (Goloza, Mokolo, etc.) are found in this zone and are the habitat of rich aquatic fauna and flora.

Plate 2.2: View of Lagdo dam shore

Plate 2.3: Harde in Waza Logone area

Photos Banga Clair 2012

b) Biodiversity features

State of flora

i **Woody plants and shrubs** (*Acacia senegal, A. laeta, A. seyal, A. tortilis, A. erhenbergiana, A. nilotica, Anacardium occidentale, Azadirachta indica, Calotropis procera, Pterocarpus lucens, Cassia siamea, Ceiba pentandra, Daniellia oliveri, Leucaena leucocephala, Combretum glutinosum, Sclerocarya birrea, Balanites aegyptiaca, Boscia senegalensis, Commiphora africana, Anogeissus leiocarpus, Ziziphus mauritiania, Leptadenia pyrotechnica, Tamarindus indica, Parkia biglobosa, Khaya senegalensis, Butyrospermum parkii*, etc.

Herbaceous plants (*Andropogon spp, Hyparhenia spp,Cenchrus biflorus, Aristida* spp., *Schoenefeldia gracilis*, *Eragrostis tremula*, etc.)

Plate 2.4: Hyppopotamuses Benue National Park – Opposite top

Plate 2.5: Birds Waza National Park-Middle

Plate 2.6: Girafes Waza National Park- Opposite Bottom

Photos by Banga Clair.2012

Plate 2.7: Forest in the Mozogo-Gokoro National Park - Below

(Photo Ntoupka Mama)

ii **Cultivated plants** (crops) such as cereals (sorghum, millet, maize; rice), roots and tubers (sweet and irish potatoes, cassava, yams), fruits (mangoes, guavas, lemons and oranges, etc.), oilseeds (groundnuts, soyabeans, sesame), cotton, plant gardening and legumes (tomato, onion,lettuce, garlic, chili, pepper, okra, Guineasorrel, niebe, Voandzou / bambara groundnut, etc.

State of fauna

i. **Wild mammals:** there is a wide variety of wild animals including lions, elephants, monkeys, bufalos, etc…the rhinoceros was decalred extinct in cameroon in 2006. (minfof, 2006)

ii. **Domesticated mammals:** domesticated mammals include cattle (zebu and taurine), small ruminants (local and crossbred sheep and goats), pigs, horses, donkeys, camels, etc…

iii. **Freshwater fish and crustaceans:**the semi-arid ecosystem has above179 species of fish and 25 endemics (musa, 2008; ramsar.wetlands.org/portal/15/cameroon.pdf). the common genera include: *tilapia, synodontis, alestes, citharinus, clarias, heterotis, hydrocynus, lates, labeo, hydrocynus, and mornmyrus.*

iv. **Amphibians, ophidians and reptiles**: these are characterised bydifferent kinds ofsnakes, lizards, frogs and toads.

v. **insects:** a large variety of insects is found in the semi-arid ecosystem and include bees, ants, simulium (vectors of river blindness filarias), centipedes, millipedes, spiders and tarentulas, as well as termites and locusts. the latter cause a lot of damage to crops and houses, etc. however, many of these insects like honey bees contribute to biodiversity through polinisation.

vi. **Avian species**:a total of316birds were reported in the semi-arid ecosystemincluding 259residentsand 57migrants (decoux et al, 1997). according to the birdlife international site, the semiarid ecosystem houses 8 of cameroon's 33 important bird areas (iba): waza, mayo louti forest reserve, logone flood plains, kalamaloue, maga, gashiga-demsa, faro and benoue.

vii. **Invasive species (native and non-native):** invasive/parasitic species include *striga spp., tithonia spp., chromolaena* (bokassa grass), water hyacinth, etc. some of them seem to have been introduced as cover or ornamental plants.parasitic species affecting livestock and fauna are numerous and include worms (roundworms, flatworms, etc.), bacteria, viruses (has been eradicated, rinderpest, avian flu, foot-and-mouth, etc.).

viii. Micro-organisms. there has been no extensive study carried out on the microorganisms in the semi-arid ecosystem. however, there are certainly many micoorganisms, some of which act either as plant or animal parasites (viruses, bacteria, fungae, etc.) while other serve as feed for fish (microflora and microfauna) or are symbiotic (rhizobium, micorhizes, etc).

Table 2.13: species classification in the semi-arid zone

critically endangered	endangered	near threatened	vulnerable
animals	**animals**	**animals**	**animals**
	lycaon pictus (african wild dog, cape hunting dog, painted hunting dog)	ardeotis arabs (arabian bustard)	acinonyx jubatus (cheetah, hunting leopard)
	gyps africanus (white-backed vulture)	circus macrourus (pale harrier, pallid harrier)	balearica pavonina (black crowned crane, northern crowned crane)
	gyps rueppellii (rueppell's griffon, rueppell's vulture)	eidolon helvum (straw-coloured fruit bat)	circaetus beaudouini (beaudouin's snake-eagle, beaudouin's snake eagle)
	necrosyrtes monachus (hooded vulture)	falco vespertinus (red-footed falcon, western red-footed falcon)	eudorcas rufifrons (red-fronted gazelle)
	neophron percnopterus (egyptian eagle,	francolinus streptophorus (ring-necked francolin)	loxodonta africana (african elephant)

	egyptian vulture)		
		gallinago media (great snipe)	panthera leo (african lion, lion)
plants	**plants**	**plants**	**plants**
vanellus gregarius (sociable lapwing, sociable plover)	crotalaria mentiens	glareola nordmanni (black-winged pratincole)	psittacus erithacus (grey parrot)
pristis pristis (common sawfish)	lefebvrea camerunensis	hyaena hyaena (striped hyaena)	sagittarius serpentarius (secretarybird, secretary bird)
		miniopterus schreibersii (common bentwing bat, schreiber's bent-winged bat, schreiber's, long-fingered bat)	torgos tracheliotos (lappet-faced vulture)
		neotis denhami (denham's bustard, stanley bustard)	trigonoceps occipitalis (white-headed vulture)
		panthera pardus (leopard)	**plants**
		polemaetus bellicosus (martial eagle)	crotalaria bamendae
		smutsia gigantea (giant ground pangolin, giant pangolin)	crotalaria ledermannii
		stephanoaetus coronatus (crowned eagle, crowned hawk-eagle)	dipsacus narcisseanus
		terathopius ecaudatus (bateleur)	habenaria obovata
			hypseochloa cameroonensis

Source: iucn 2012. iucn red list of threatened species. version 2012.2. <www.iucnredlist.org>.

c) Biodiversity hotspots

National parks as major hotspots include: waza (170 000 ha), benoue (80 000 ha), bouba djida (220 000ha), faro (330 000 ha), mozogo gokono (1 400 ha), kalamaloue (4 500 ha), vallee du mbere (77 760 ha).

Table 2.14: protected areas in semi arid ecosystem

protected areas types	**existing protected areas**		**protected areas proposed to be gazetted**	
	number	**surface areas (ha)**	**number**	**surface areas (ha)**
national parks	7	805 900	1	264 075
wildlife reserves				
wildlife sanctuaries				
zoological gardens				
floral sanctuaries				
hunting zones				
community hunting zones				
total	**7**	**805 900**		**264 075**

Source: compiled from minfof documents (2012)

2.2.7 freshwater ecosystem

An important concern for hydrological ecosystems is securing minimum streamflow, especially preserving and restoring instream water allocations. fresh water is an important natural resource necessary for the survival of all ecosystems. the use of water by humans for activities such as irrigation and industrial

applications can have adverse impacts on down-stream ecosystems. chemical contamination of fresh water can also seriously damage eco-systems. ollution from human activity, including oil spills, also presents a problem for freshwater resources.

Changing landscape for the use of agriculture has a great effect on the flow of fresh water. changes in landscape by the removal of trees and soils changes the flow of fresh water in the local environment and also affects the cycle of fresh water. as a result more fresh water is stored in the soil which benefits agriculture. however, since agriculture is the human activity that consumes the most fresh water, this can put a severe strain on local freshwater resources resulting in the destruction of local ecosystems

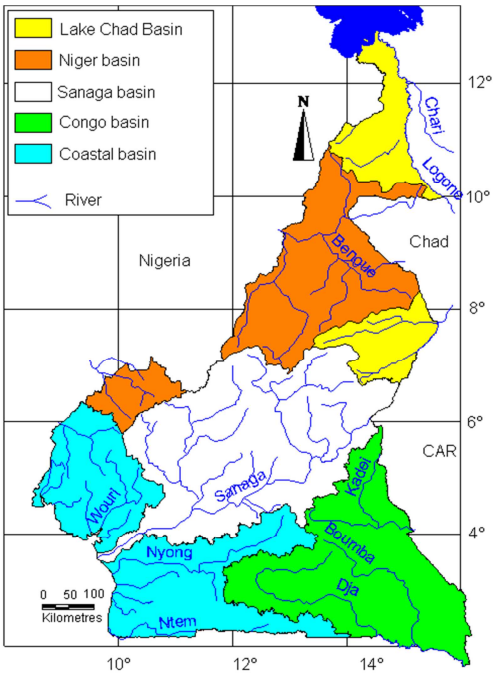
There are many causes of the apparent decreasein our fresh water supply. principal amongst these is the increase in population through increasing life expectancy, the increase in per capita water use and the desire of many people to live in warm climates that have naturally low levels of fresh water resources. climate change is also likely to change the availability and distribution of fresh water across the planet. the world bank adds that the response by freshwater ecosystems to a changing climate can be described in terms of three interrelated components: water quality, water quantity or volume, and water timing. a change in one often leads to shifts in the others as well. water pollution and subsequent eutrophication also reduces the availability of fresh water.

Freshwater resources in cameroon. cameroon is endowed with abundant freshwater resources both in quantity and quality. according to gwp/minee (2009a), the total renewable freshwater resources in cameroon are 283.18 km^3 per year, with a dependency ratio of 4.4 % which indicates that most of the renewable water is internally produced.

Surface water. Cameroon has a dense network of rivers, most of which arise on the Adamawa plateau and flow north or south. There are five main hydrological basins in Cameroon. These are; the Sanaga, Congo, Niger (Bénoué), Chad and Coastal basins. Figure 2.2 shows the five main hydrological basins of Cameroon while Table 2.16 gives the extent of each basin and the percentage of the national surface area occupied by each basin. Lakes also constitute important surface water bodies in Cameroon. These lakes range from natural lakes (resulting mostly from volcanic activities e.g. Lake Nyos, Barombi etc) to man made lakes like the Yaoundé municipal lake.

Lake Chad Basin. The portion of the Lake Chad Basin in Cameroon is found in two geographical locations; the northern and the southern portions as shown on Figure 2.2. The northern portion of the basin is found between longitude 13°40’ and 15°41’ E, and between latitude 9°54’ and 13°04’ N. MINEE and GWP-Cmr (2009b) determined the area of the northern part of the basin to be 27 470 km^2. The southern section is found between longitude 13° 24' and 15° 35' E, and between latitude 6° 36' and 8° 19' N and has a surface area of 21 670 km^2.

Figure 2.2The Hydrological Basins of Cameroon



The Rivers Chari and Logone are the only permanent rivers in the northern section of the Chad basin. Other rivers in this sub-basin are seasonal and temporal rivers locally called mayos, which take their rise from the Mandara Mountains. The Vina and Mbéré rivers are the principal rivers in the southern portion of the basin and they take rise from the Adamawa Highlands.

Niger Basin. The Niger basin is one of the major basins in Africa and covers an area of about 1 500 000 km^2. It includes parts of Guinea, Chad, Mali, Benin, Burkina Faso, Cote d'Ivoire, Nigeria and Cameroon. The Bénoué sub-basin in Cameroon is part of the Niger Basin which is composed of two parts; the tropical (north) and the sub-equatorial (southern) parts.

The northern part of the Bénoué basin stretches from longitude 11°47' and 15°48' E and latitudes 6°49' and 10°51' N with its exit at the Cameroon and Nigeria border. The Bénoué basin itself is an international basin with a total area of 95 000 km^2 with 78.95 % in Cameroon, 18.95 % in Chad and 2.10 % in Nigeria.

The southern section of the Bénoué basin is located in tl part of Cameroon. The Cameroonian portion of this basi from latitude 5°46' to 7°09' N. It has an area of 12 900 and 2 800 km^2 found in the Donga basin.

Table 2.15: Extent of River Basins and percentage of national surface area

Basin	Area in km^2	% of national mainland area
Chad	38,000	8.20
Bénoué	90,250	19.47
Sanaga	140,000	30.20
Congo	94,860	20.46
Coastal	100,440	21.67
National	**463,550**	100

Adapted from MINEE and GWP-Cmr, (2009b)

Sanaga Basin. The Sanaga basin contains the longest river in Cameroon; the river Sanaga. It is located in the centre of the country and is the largest basin in Cameroon, covering about 30 % of the national territory. It takes its rise from the Adamawa plateau and flows for 918 km before entering into the Atlantic Ocean (Neba, 1999). The basin is located between latitude 3°29' N and 7°22' N, and longitude 9°38' E and 14°54' E. This basin is essentially a national basin with only about 0.15 % found in the Central African Republic. The basin extends into 6 of the 10 regions of Cameroon: Adamawa, North-West, West, East, Central and Littoral. The major tributaries of the Sanaga basin are the Lom, Djerem, Mbam and Noun rivers.

Congo Basin. The Congo basin is one of the major river basins in Africa and is found in six different countries. The Cameroonian portion of this basin coincides with the west section of the Sangha basin. The Sangha basin extends from longitude 11°49' to 16°42' E and between latitudes 1°16' and 6°45' N. It has a surface area of 158 350 km^2 at Ouesso in the Republic of Congo. The Cameroonian section of the Congo basin is found between longitude 11°49' and 16°12' E and latitude 1°38' and 5°55' N and has a surface area of 93 000 km^2. Its major tributaries are the Sangha, Kadei, and Boumba-Dja-Ngoko rivers.

Coastal Basins. These basins are found in the North West and the south of the Sanaga basin as shown on Figure 2.2. The portion to the NW of the Sanaga is located between longitude 8° 29' E and 10° 49' E and latitudes 3° 36' N and 6° 21' N. This portion has a surface area of about 45 000 km^2. The southern section of the coastal basins stretches from longitude 9° 39' E and 13° 29' E and latitudes 2° 09' N to 4° 31' N and has a surface area of 71 000 km^2. It major tributaries are the rivers Wouri, Nyong and Mongo.

According to GWP/MINEE (2009a), the total volume of surface water produced internally in Cameroon is estimated at 267.88 km^3, which ties very well with the estimates of FAO (2010) of 268 km^3. The greatest contribution of the surface flow in Cameroon is from the Coastal basins which account for more than a

third of the flow in Cameroon (35.4 %). This is followed by the Sanaga basin with 24 %. The lowest contribution to the surface flow is from the lake Chad Basin with 12.4 %

Ground Water. According to Sighomnou (2004), most of the ground water resources in Cameroon are found in three sedimentary basins located in the Lake Chad, Bénoué and Coastal Basins of Cameroon. There are however some minor sedimentary basins which are not well known. Small quantities of ground water resources are also found in fractures in crystalline and volcanic formations.

According to MINEE and GWP-Cmr (2009a), the ground water resources of Cameroon are estimated at about 56 km^3 as shown on Table 2.17. Close to 40 % of these resources are found in the sedimentary coastal aquifer while the minimum (5.72 %) is found in the Lake Chad basin sedimentary aquifer. As concerns the sedimentary aquifers, there seems to be a correlation between rainfall and the amount of groundwater resources i.e. as rainfall decreases from south to north, so too do the groundwater resources

Characterization

The major composition of this ecosystem is Limnological (continental lakes), and Lithological (continental rivers including wetlands). The rivers flow across several ecosystems and are subject to modification. The lakes are classified in to 4 categories: crater lakes of volcanic reservoirs, Subsistence or lowland lakes, Basin lakes (e.g., Lake Chad) and artificial lakes (e.g., Lake Maga), impoundments. *(Ramsar, 2010)* The surface areas of some major reservoirs and rivers basins are given below in the table.

Table 2.16:Estimated ground water resources of Cameroon

Aquifers	**Volume (km^3)**	**% of total**
Lake Chad (sedimentary)	3.20	5.72
Benoue (sedimentary)	15.75	28.14
Coastal basins (sedimentary)	21.60	38.64
Zone de socle	15.40	27.51
National or Total	**55.98**	**100**

Source: MINEE and GWP-Cmr, (2009a)

Biological features

Cameroon has very unique wetland diversity from its very dense hydrological network, drained from the Adamawa and from Nyong-Sanaga dorsal along the four drainage basins: Atlantic, Congo, Niger and Chad.*(Ramsar, 2010)* The Atlantic basin consists mainly of the Sanaga and coastal rivers (Nyong, Ntem, Moungo, Wouri) in the south with the Sanaga being largest river and over 920km long occupying a basin area of 140 000km^2. In the western and Northwest we have the Bui and the Noun Rivers), the Donga, Katsina Ala and Menchum rivers, the Benue, the Momo River, the Cross river. Numerous waterfalls and rapids interrupt these rivers (especially Mentchum, Abi, Nachtigal, Ekom, Mungo and Lobe falls). There are also numerous lakes including crater lakes (Barombi, Oku, Nyos, Wum, etc) from volcanic activities along its highlands; tectonic lakes from large depressions especially in the coastal plains (Ossa, Ejagani, etc); basin lakes including Lake Chad (12,500 ha) in the north, and a range of artificial lakes from dams, for irrigation (Bamendjin on Noun river, Mbakaou on Djerem in the western region, Lagdo on Benue, Mape on the Mbam and Songloulou on Sanaga etc).*(Tchotsoua et al., 2008)* These aquatic ecosystems are very rich in biodiversity components and require conservation.

The biodiversity components comprise mainly flora and fauna. However, we also find another group consisting of micro-organisms, and mixed taxa (invasive species and aquaculture species).

State of flora

The flora comprises mainly raphia swamps, river bank vegetation, swamp forest and herbaceous swamps and flood plains.

Raphia Swamps: In addition to their occurrence on the landward sides of mangrove swamps, *Raphia* associations cover many swampy valley floors and line forest rivers and streams in riparian strips. Forest streams, just a few metres wide, may support a *Raphia* belt a dozen trees wide on either bank, especially in areas subject to periodic inundation. The swamp forest and riparian associations are floristically distinct. *Raphia hunzilis* dominates montane valley floors in the southwest, while *Raphia laurentii* (= R. monbuttorunt) covers swampy valley floors, often in belts 3 km across, and is the most widespread species in southern Cameroon. *Raphia hookeri* is more common in riparian forests. It is common in the Boumba, Doume, upper Dja and Nyong valleys and tends to occupy the types of sites in which *Raphia sese* is dominant in the central Zaire Basin.

River Bank Vegetation: Ground cover which may be dense along the banks of wide rivers includes *Adiantunt vogelii, Afrontomum pseudostipulare, Boehmeria platyphylla, Cyperus fertilis, Dracaena ovata, Hypolytrum heteromorphum, Palisota megalophylla, Scleria verrucosa, Stipularia africana* and *Trachyphrynium braunianum.* In the water along the river banks *Adenostemina perrottetii, Cyclosorus striatus, Comnzelina* sp., *Floscopa confusa, Hibiscus* sp., *Impatiens irvingii, Isachne buettneri, Leersia hexandra, Pistia stratiotes, Platostoma africanum, Polygon um limbatum, P. strigosum, Pycreus smithianus, Rhynchospora corymbosa* and *Thalia welwitschii* are common. *Nymphaea caerulea* and *N. lotus* are common on open water at the edges of lakes, with submerged species of *Ceratophyllum, Myriophyllum, Najas, Potamogeton* and *Utricularia.* Shady forest pools are covered by *Azolla* and *Lonna.* Vast floating grass swamps are extensive along the courses of some rivers, e.g. the Nyong and its principal affluents below Ayos. Here *Echinochloa pyranzidalis* is dominant, but with numerous sedges and *Azolla africana, Ceratophyllum demersum, Hydrocharis chevalieri, Impatiens irvingii, Ludwigia repens, Nymphaea lotus, N. maculata, Pistia stratiotes, Polygonum* spp. and *Utricularia foliosa* as typical associates.

Swamp Forests: In southern part of Cameroon, floodplain forests are characterised by a high proportion of *Uapaca paludosa,* or in semi-deciduous zones of *Uapaca guineensis.* Herein there is an under-growth which contains an abundance of *Adiantunt vogelii, Aframonium pseudostipulare* and *Trachyphrynium braunianum.* However, moving north through the savanna zone *Uapaca guineensis* is progressively replaced by *Uapaca togoensis.*

Herbaceous Swamps and marshes: In the transitional zones between forest and savanna, both permanently and periodically inundated valley floors are be covered by herbaceous vegetation. Periodically inundated (floodplain) herb swamps are found on the Boumba River near Medoum, on the Bek near Ngato, on the Dja near Mintom and in the north, along the Kadey River, and near the confluences of the Pangar, Lom, Djerem and Sanaga Rivers in the upper Sanaga Basin. Here the dominant species is generally *Leersia hexandra,* with *Cyclosorus striatus, Rhynchospora corymbosa* and *Scleria* sp. as the most abundant associates, and *Axonopus flexuosus, Cyperus difformis, Fimbristylis* sp., *Indigofera spicata, Lipocarpha chinensis, Melochia pelissifolia, Oldenlandia lancifolia, Pycreus smithianus, Sporobolus pyramidalis, Thalia welwitschii* and *Torenia thouarsii* as less important associates. *Pandanus candelabrum* and *Phoenix reclinata* often fringe these swamps, in dense belts, and some bushy species intrude into them, often forming little clumps. Among these, *Antidesma venosum, Mimosa pigra, Sida* sp., *Stipularia africana* and *Triumfetta* sp. are most common.

Herbaceous Floodplains: In the zones of deep and prolonged inundation to the south of Lake Chad, where water depths may exceed 2 m, typical floodplain grasses predominate. *Oryza barthii* dominates the most deeply flooded zones, giving way to *Echinochloa pyramidalis* in the middle zone and this in turn to

Hyparrhenia rufa and *Vetiveria nigritana* on the margins. In the drainage channels, which attain depths of a metre or more, and in the lakes and pools, one finds an ephemeral aquatic flora comprising such species as *Aeschynomene crassicaulis, Aponogeton subconjugatus, Burnatia enneandra, Centrostachys aquatica, Ceratopteris cornuta, Eichhornia crassipes* (among the most abundant), *Eriocaulon bifistulosum, Heteranthera callifolia, Ipomoea aquatica, Limnophyton obtusifoliunz, Lophotocarpus guayanensis, Marsilea crenulata, Nymphaea lotus, N. rufescens* (among the most abundant), *Nymphoides indica, Ottelia ulvifolia* and *Schlleropsis lutea* (naturalised). Among the rooted submerged species *Ammania auriculata, Limnophila barteri, Rotala mexicana, R. tenella* and *R. welwitschii* are most common. Free-floating submerged species include *Chara zeylanica, Najas graminea, N. pectinata, Nitella acuminata,* and on the surface *Utricularia benjinziniana, U. gibba* var. *exolata* and *U. inflexa* var. *stellaris.* In the more superficially flooded areas, a mosaic vegetation develops in the rainy season, with patches of different composition, some containing only one gregarious species, others being heterogeneous. The southern shores of Lake Chad are fringed by great stands of *Cyperus papyrus* and *Phragmites nzauritianus* with much *Vossia cuspidata* in the water, while on the northern shores these species are replaced by *Phragnzites australis* and *Typha latifolia* var.*australis.(*Letouzey)

State of Fauna

The fauna of this ecosystem comprise mainly: aquatic bentic fauna, mammals, Birds, reptiles, amphibians, fish, crustaceans and gastropods.

i) **Benthic fauna:** This is poorly documented except in the semi-arid ecosystem, where Lake Tchad has been found to host 3 groups of benthic macro-invertebrates comprising Worms, Molluscs and Insects.*(Leveques et al, 1979).*We find 5 families and 24 species of insects (Chironomides dominant (12 species), Tanypodinae (4sp), and the rest Orthocladiinae, Ephérnéroptères, Trichoptères); 3 families of Oligochaetes and 6 species dominated by the Naididae (4 species), with the Tubificidae (2species), and Alluroididae (1 species) and 2 groups of molluscs and 10 species dominated by Lamellibranches (7 species), followed by Prosobranches (3 species).

ii) **Mammals:** *Trichechus senegalensis* (lamentin)occurs in all the river basins, (Benouè and Kebbi Rivers, the Lake Chad Basin, Sanaga and Nyong Rivers, Kadey Sangha River but is now an endangered species.*(Ramsar.wetlands.org/Portal/15/Cameroon.pdf).Hippopotamus amphibius***is**common and widespread, including the floodplain of the Logone/Chari Rivers in the far north. Other large mammals resident in, or otherwise dependent upon, the wetlands, including the periodically flooded areas, are *Cephalophus maxwelli, C. monticola, C. ogilbyi, C. sylvicultor, Felis aurata* (South only), *Kobus ellipsiprymnus, K. kob, Loxodonta africana, Maids gigantea, Panthera pardus, Phacochoerus aethiopicus, Potamochoerus porcus, Redunca redunca* (north), *Sylvicapra grimmia, Syncerus caffer, Tragelaphus euryceros, T scriptus* and T *spekei.* Small mammals include *Aonyx capensis, Atilax paludinosus, Herpestes ichneumon, H. sanguineus, Lutra maculicollis, Thryonomys gregorianus* and *T. swinderianus.* Arboreal species include *Anomalurus beecroftii, A. derbianus, A. pusillus, Cercocebus albigena, C. torquatus* (South only), *Cercopithicus aethiops, C. cephus, C. l'hoestii preussii* (SW only), *C. mona mona* (South only), C. *neglectus* (SE only), C. *pogonias* (South only), *Colobus badius preussii* (SW only), *C. polykomos satanas* (South only), *Dendrohyrax dorsalis, Funisciurus lemniscatus, F. leucogenys, F. pyrrhopus, Galago senegalensis, Heliosciurus rufobrachium, Idiurus macrotis* (South only), *I. zenkeri* (South only), *Miopithecus talapoin* (South only), *Myosciurus pumilio* (South only), *Nandinia binotata* (South only), *Paraxerus poensis* and *Protoxerus stangeri.(Ramsar.wetlands.org/Portal/15/Cameroon.pdf).* At least 35 species have been declared threatened.*(Djoh et Diang, 1997; Decoux et a., 1997).* In addition to most of the foregoing, mammals which visit the galleries and floodplains in the north include *Acinonyx*

jubatus, Aepyceros melampus, Cephalophus rufilatus, Cercopithecus nictitans, Crocuta crocuta, Damaliscus lunatus, Felis lybica, Hippotragus equinus, Hyaena hyaena, Ichneumia albicauda, Leptailurus serval, Panthera leo, and *Taurotragus derbianus,* while smaller species include *Felis caracal, Genetta tigrina, Mungos mungo, Viverra civetta* and *Vulpes pallid*

iii) **Birds: A** total of 312 bird species associated with the freshwater ecosystem is reported.*(Decoux et al., 1997).* Of these 216 are resident and 96 migrants particularly around lake Tchad and the flood plains. Lake Tchad and wetlands support above 200,000 birds, while the Waza Logone supports above320,000water birds from 104 species, and Lake Maga above 20,000 water birds. *(Ramsar, 2012, Birdlife International 2012).*Lake Oku situated in the Mountain/Forest sanctuary in the Northwest region is a site for the rare and globally endangered Bannerman's Turaco (*Tauraco bannermani*).*(Nsoh et al. 2006).* We find that the river warbler *Bradypterus grandis* and *Ploceus batesi* (a forest weaver, endemic species) are typical in the south while Lake Barombi is known to be an important sanctuary for birds. Several species of birds are predators of fish and are found to be particularly abundant along the rivers. These include mainly *Phalacrocora africanus*, darter (*Anhinga rufa*), pied king fisher (*Ceryle rudis*), and the malachite king fisher (*Alceda cristata*). Birds of the northern floodplains have many species in common with equivalent floodplains south of the equator. Here *Balearica pavonica, Coracias abyssinica, Ephippiorhynchus senegalensis, Haliaeetus vocifer, Leptoptilos crumeniferus, Merops bullocki* and *M. nubicus* occur, together with herons, egrets, weavers, warblers, ducks and geese.*(Ramsar.wetlands.org/Portal/15/Cameroon.pdf)* It is important to note here that the many lakes along the rivers in these wetlands now form important staging posts for migratory birds, wildlife. Other species include: Owls, eagles, skimmers, darters, cormorants, and herons.*(Reid, 1989, ECOFAC, 1998, Ramsar.wetlands.org/Portal/15/Cameroon.pdf).*

iv) **Reptiles:** Three (3) speciesof crocodiles: *Crocodylus cataphractus, C. niloticus* and the vulnerable dwarf crocodile *Osteolamo tetraspis* or alligator are present in this ecosystem. At least 13 aquaticor semi-aquatic snakes are documented and include: *Bothrophthalmus lineatus, Boulengerina annulata, Grayia smythii, Naja melanoleuca, Natrix anoscopus, Philothamnus sp., Psanzmophis sibilans* and *Python sebae, while Boiga blandingii, Dasypeltis fasciata, D. scabra, Dendroaspis jamesonii, Philothamnus semivariegata, Thelotornis kirtlandii and Thrasops occidentalis. Four* (4)species Tortoises and Turtlesnotably the forest hinge-back tortoises (*Kinixys erosa* and *K. homeana*) and (*Amyda triuguis* and *Trionyx triunguis*) respectively have also been documented here.*(Reid, 1989; Foguekem & LeBreton, 2002)*

v) **Amphibians:** The amphibian fauna in freshwater ecosystems is poorly documented. However, there is an abundance of amphibian larvae(frogs and tadpoles) particularly *Amphilius spp*. Adult males of hairy frogs(*Trichobatrachus robustus*) occur in some streams and rivers. The African clawed toads (*Xenopus spp*.) are cosmopolitan*(Reid, 1989)* here. Goliath frogs(*Conraua goliath*) are known in the southwestern Cameroon along the Sanaga River. These are the largest frogs in the world, growing to bodies of 12 inches or longer. They are carnivores, living off insects, crustaceans, fish and other amphibians and threatened. *(Ramsar.wetlands.org/Portal/15/Cameroon.pdf; IUCN redlist data, 2008).*

vi) **Fish:** The fish fauna reflects affinities with the major drainage basins adjacent to the region, the Niger, Chad and Congo Basins. About 496 freshwaterfishes are known for Cameroon*(Fish Base (http://www.fishbase.org/)* with 12 critically Endangered. The Tropical Humid Dense forest ecosystem is the richest with above 294 fishspecies of which 78 are endemics.*(Vivien, 1992; Kamdem, 1998)* Lake Barombi in the SW Region has 11 endemicspecies and one

endemicsubspecies of fish.*(Trewavas et al. (1972; Trewavas, 1974)* Lake Dissoni in the Rumpi Hills harbours one endemic poeciliid *Procatopus lacustris* and one endemic Barbus and Clarias. *(Trewavas, 1962; Schlieven 1996b).* In addition to the endemic fishes Lake Barombi Mbo harbours one endemic sponge (*Corvospongilla thysi*).*(Trewavas, 1962).* The Semi-Arid has above179 species of fish and 25 endemics*(Musa, 2008; Ramsar.wetlands.org/Portal/15/Cameroon.pdf),* while the Savannah and Montane Ecosystemsare very poorly documented in terms of species. Major fish families: *Cichlidae, Cyprinodontidae, Cyprinidae, Clariidae, Bagridae, Characiidae, Distichodontidae, Synodontidae.* Common genera: *Tilapia, Synodontis, Alestes, Citharinus, Clarias, Heterotis, Hydrocynus, Lates, Labeo, Hydrocynus, and Mornmyrus.*

There has been increasing loss of fisheries (estimated 90% decline in fish yields within flood-fed wetlandsand in the lakes *MINEPIA 2012 reports),* and a reduction of the capacity of the wetlands to provide nursery for fish stocks in the wider river systems resulting to some species reaching the threatened threshold value. Cameroon has about 26 threatened fish species with 11 (eleven species) highly threatened.

vii) Crustaceans: Significant within the crustacean group we find the giant African river prawn, *Macrobrachium vollenhoveni*and the similar smaller species, *Macrobrachium macrohacrion* locally called "mucosa" of the family Palaemonidae widely distributed in the fresh water systems within this ecosystem. (Gabche et al., 2001) Lake Barombi Mbo has one endemic but undescribed caridinid shrimp *Caridina sp*. (Trewavas et al. 1972). Exploitation of Palaemonidae has been motivated by their high demand as food, the use of sundried smaller individuals as condiments for flavouring food and its source as a foreign exchange earner especially in the south region.

At least 7 species of freshwater crabs have been identified within the northern Gulf of Guniea including highlands of Cameroon (3 species), and Southern Cameroon (families Potamonautidae and Potamidae). These include: *Loiusea balessi, Loiusea edesensis, Potanonemus mambilorum, Potamonautes regneiri, Potamonautes. sp.,* genus *Sudanonautus sp.* (5 species) including *Sudanonautussangha*. Of these *Loiuseabalssi* is endangered together with *Loiuseaedensensis*. (*Brooks et al, 2011)*

viii) **Gastropods**: The diversity of gastropods in the freshwater environment is limited. However, we find herein a diversity of Clams, Mussels and molluscs. In the group of molluscs, *Potadoma kadei* from the kadei river is critically endangered, while *Potadoma nyongensis*, *P. trochiformis, P. zenkeri, P. angulata* and *Bullinus camerunensis* are endangered and *P. riperti* data deficient and most from the eastern region. A single species of mussel *Coelatura lobensis* is vulnerable in the south region while one species of clam of the family Donacidae and genus *Egeria sp.* is known from the Lower Sangha river.(*Brooks et al, 2011)*

Microorganisms

Various species of microorganisms constitute an important food source for young and some adult freshwater fish fauna. These comprise essentially zooplankton and phytoplankton. These micro-organisms influence fish growth and consequently fish production in freshwaters and have been well documented for the zooplankton and phytoplankton. About 60 species of zooplankton Cladocera (mainly chydoridae), above 50 species of rotifers (mostly Lecanidae and Brachionidae), and 67 species copepods (mostly Cyclopoida) have been documented. Also above 100 species of phytoplankton (main families being Diatoms) do occur here. (*Chiambeng, 2004 ; Durand and Leveque, 1980 ; Rey et Sainte Jean, 1968)* Within the zooplankton Cladocera one new genera Nicsmirnovius and two species (*Nicsmirnovius camerounensis* and *Bryospilus africana)* have been reported from the Korup National park and environs.

(*Chiambeng, 2004)* In addition two new species of calanoid Copepoda have also been documented for Cameroon: *Tropodiaptomus njamae* and *Tropodiaptomus njini.* (Chiambeng & Dumont, 2002*)*

2.3 CURRENT POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

The current framework for the protection of Cameroons rich biodiversity is characterized by a plethora of biodiversity and biodiversity related policies, legislations, regulations and institutions with intervention measures through programs and projects to ensure their implementation. Responding within the dynamics of an increasing realization of the importance of biodiversity to livelihoods and the nation's economy, the last decade has been marked by a corresponding expansion in the framework of legal norms and modification of the institutional framework with defined roles and responsibilities for biodiversity protection. Major programs and projects have been designed and implemented with significant achievements in protection of the nation's biodiversity, specific ecosystems and others in specific thematic areas.

2.3.1 POLICY AND LEGAL FRAMEWORK

In the hierarchy of norms, the protection of Cameroon's biodiversity is shaped by relevant international and regional instruments ratified by Cameroon, biodiversity related policies, laws and regulations. These instruments are an emanation of Constitutional mandate and orientation

2.3.1.1 Fundamental Instrument

The Constitution provides the fundamental basis for protecting the environment in general including biodiversity. Specifically, the 1996 Constitution institutes fundamental environmental rights which obligate ensuring Cameroon's ecosystems are healthy and valorizing its rich biodiversity as priority national concerns and impose the responsibility to achieving this on all actors. It allows for the incorporation of international law into national legal frameworks and thus the integration of several biodiversity related conventions and protocols ratified by Cameroon.

2.3.1.2 International and Regional Instruments

An abundance of multilateral environmental agreements to which Cameroon is party (See Table 2.17) have been of significance to biodiversity in providing the framework for international and regional cooperation in the protection and valorization of biodiversity as a global heritage and in the conservation and management of shared trans-boundary ecosystems.

At a regional and sub-regional legal, major Conventions and Agreements have been concluded (See Table 2.18) to manage shared ecosystems under threats and to address threats relating to thematic issues of relevance to biodiversity and to animal or plant species. An example is the Central Africa Sub Regional Treaty and its Convergence Plan of the Conference of Ministers of Forest for Central Africa (COMIFAC) is an initiative of the Heads of States of the Region and a spill out of the 1999 Yaounde Declaration and seeks to ensure harmonization and coordination of sub regional policies and strategies for the conservation and sustainable management of forest resources. Key biodiversity sub regional dialogue platforms currently facilitated by and within the COMIFAC landscape include, the Conference of Ministers; Central Africa Technical Working Group for Biodiversity (GTBAC) charged with coordinating the implementation of the decisions of the CBD through National focal Points; other platforms for the implementation of biodiversity related conventions such as the UNCFCC; Sub regional network for Parliamentarians (REPAR); Sub regional Network for Protected Areas (RAPAC), networks for Women (REFADD); Networks for civil society organisations in the forest ecosystem (CEFDHAC) Sub regional Network for Indigenous People (REPALEAC) etc…

Other ecosystem specific Regional agreements with significant contributions have been the 1981 ABIDJAN Convention for the protection and sustainable use of the shared marine and coastal

environment that has coordinated major interventions in the coastal and marine zone, the Lake Chad Basin Commission has coordinated the management of the shared wetland increasing under regression and degradation. The Congo Basin Forest Partnership (CBFP) has coordinated and supported interventions in trans-boundary forest landscapes of importance.

Table 2.17 Cameroon and Multilateral Environmental Agreements

s/n	MEA	Date entry into force	Cameroon Ratification	Cameroon Accession
1	Convention on Biological Diversity, Rio de Janeiro,	05/06/1992	29/08/1994	
2	UNFramework Convention on Climate Change, and its Kyoto Protocol, Rio de Janeiro,	04/06/1992	19/10/1994	
3	United Nations Convention to Combat Desertification	17/06/1994	29/08/1994	
4	Convention on International Trade in Endangered Species of wild plants and animals (CITES),	03/03/1973	05/06/1981	
5	Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar),	02/02/1971	11/01/2006	
6	Bonn Convention on Migratory Species of Wild animals (CMS),	23/06/1979	01/11/1983	
7	Convention on the Protection of World Heritage, Culture & Nature	16/12/1972	07/12/1982	
8	United Nations Convention on the Law Of the Sea (UNCLOS),	10/12/1982	19/11/1985	
9	International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC),	21/11/ 1973	24/12/1998	
10	International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties Intervention Convention,	29/11/1969		09/03/1984
11	International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage,	18/12/1971	12/08/1984	
12	Convention on the protection the Ozone layer.	22/03/1985		30/08/1989
13	Convention on Assistance in Case of Nuclear Accident or Radiological Emergency	26 /09/1986	07/02/2005	
14	Convention on the Control of Transboundary Movements and Disposal of Hazardous Wastes.	23/03/1989	11/02/2001	
15	Convention on the Procedure for Prior Informed Consent relating to Chemical products and Dangerous commercial pesticides (PIC),	11/09/1998	20/05/2002	
16	Convention on Persistent Organic Pollutants (POPs), Stockholm	22/05/2001	20/05/2002	
18	International Treaty for Plant Genetic Resources for Food and Agriculture (ITPGRFA)	03/11/2001	19/12/2005	
19	Montreal Protocol on the Control of ChloroFluoroCarbons (CFC)	11/12/1997	17/05/2004	
20	Montreal Protocol on substances that deplete the Ozone Layer	1987	30/08/1989	
21	Cartagena Protocol on Biosafety	23/01/2000	20/02/2002	

Table 2.18: Regional Agreements/Strategies

N°	MEA	Date entry into force	Ratification	Accession
1.	The Binational Sena Oura/Boubandjida – Yamoussa (*BSB-Yamoussa*) Agreement. (Cam-Chad-RCA)	2013		
2.	PAPECALF (Sub Regional Action Plan for Strengthening the Enforecment of Wild Life Laws)	2012-2017		
3.	The TRIDOM (Tri-National Dja-Odzala-Minkebe) Accord	2005		
4.	The TNS (Trinational de Sangha) Accord	2000		
5.	Treaty of the Commission of Ministers of Forest of Central Africa for the Conservation and Sustainable Management of Forest Ecosystems (COMIFAC)	2000		
6.	The Yaounde Declaration	1999		
7.	Convention on African Migratory Locusts, KANO/Nigeria,	1994		
8.	Nairobi Convention on Climate Change, Nairobi,	1992		
9.	Bamako Convention on the ban on the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa, Bamako,	1991	01/03/1991	
10.	The Libreville/Gabon Agreement on co-operation and dialogue between	1983		

	the States of Central Africa on the conservation of wild fauna.			
11.	Abidjan Convention relating to cooperation in the domain of protection and valorization of marine and coastal zones of West and Central Africa,	1981		01/03/1983
12.	Abidjan Convention on Cooperation in the fight against marine pollution in emergency situations	1981	01/03/1993	
13.	Convention for the Création of the Niger Basin Authority, Faranah/Niger,	1980		
14.	Niger Protocol on Fund for Development of the Niger Basin, Faranah,	1980		
15.	The ENUGU/Nigeria Agreements relating to fauna and flora in the conventional basin of the lake Chad,	1977		
16.	The Yaounde Agreement for the creation of the development funds of the commission of the Lake Chad basin,	1973		
17.	African Convention on the Conservation of nature and Natural Resources, Algeria,	1968	29/9/78	
18.	Convention on the Lake Chad Basin Commission, Fort Lamy, Chad,	1964		
19.	Niamey/Niger Agreement on the creation of the commission of the NIGER river	1964		
20.	The Niamey Act on navigation and economic co-operation between the States of the Basin of Niger	1963		
2	International Agreement on Tropical Woods			

2.3.1.3 National Framework Policies

The current biodiversity policy and related legal instruments were informed by international rules and principles which have been translated in key policies for the environment in general and the Rio conventions-related policies which provide the overall framework and orientation for the development other specific strategies and laws.

- **GROWTH AND EMPLOYMENT STRATEGY (GESP)**

An evaluation of the 2003 Poverty Reduction Strategy Paper (PRSP) which set the goals for Cameroon to attain the Millenium Development Goals highlighted a fragile economy marked by a rising cost of living at the domestic level, an international financial crisis, and a general food and energy crisis and called for a more ambitious and strategic development approach. The 2010 Growth and Employment Strategy Paper (GESP) also known by the French acronym "DSCE", was adopted to provide a long term response with a 2035 vision for Cameroon to become an emerging industrial country, reduce the rate of poverty rate and increase per capita income.

GESP is the first phase of implementation of the long-term development vision and achievement of the MDGs with a ten year medium term plan (2010 – 2020) which describes the country's priorities from an integrated development framework, a financial coherence framework, a government action and external support coordination framework, an advisory and consultation framework with key stakeholders and, provides a guide for monitoring and informing the management process.

Of key importance is the integrated development framework that prioritizes wealth creation and employment through infrastructural development with major projects in key production sectors, and improved access to water and energy.

- **2012 National Environmental Management Plan (NEMP II)**

The 1996 National Environmental Management Plan (NEMP) revised in 2012 as NEMP II provides the policy framework for intervention in environmental matters. In a visionary approach, NEMP II recognizes the protection of the environment as an integrate part of the process of development and thus envisions the pathway for growth as one with a green economy which reduces carbon emissions and pollution, and prevents biodiversity loss. Based on this new orientation, the NEMP II provides for 4 key programs with 11 strategic components in response to the current threats and regressive trends in the state of the

environment. The long term objectives of these programs are to very significantly reduce the loss of biodiversity, mitigate the impacts of climate change and desertification, fight against pollution and noise, and promote sustainable development. A fifth cross cutting program is focused on institutional development and the improvement of working conditions. The NEMP has been operationalised through several strategies some of which are currently being revised or updated. :

- **2000 National Biodiversity Strategy and Action Plan (NBSAP)**

This maiden strategy which served as a reference for biodiversity interventions adopted an ecosystem approach in defining priority actions to be undertaken in realization of the objective to stop the loss of biodiversity. An assessment of the national implementation of this document highlights a weak appropriation of the document by key stakeholders. However, the strategy served as an effective platform for monitoring national progress and reporting under its commitments to the CBD. Four National Reports (NRs) on the state of Biodiversity were prepared and submitted to the CBD as follows: NR1 in 1998, NR2 in 2002, NR3 in 2006 and NR4 in 2009. The present document is a revision and update of the 2000 NBSAP which provides a revised vision and a new orientation for all interventions in reversing the trend of biodiversity loss. The preparation of the 5th NR to the CBD is expected to be finalized by March 2014.

- **Framework Strategies for other Rio Conventions**

Strategies for the implementation of other Rio Conventions have all been relevant for biodiversity protection such as the:

  - **2004 National Communication Plan for Climate Change.** This first National Communication on Climate Change adopted in 2004 provides an inventory of existing carbon and presents strategies for climate change mitigation and adaptation. In 2010 an Adaption Plan was developed driven by the strategy framework. The National Communication is currently under revision.
  - **National Plan for the fight against Desertification (PAN/LCD) designed to** respond to the threats of the sahel and savannah highlands has the global objective to reverse the trends of desertification and land degradation as a means to fight against poverty and promote sustainable development.

- **Thematic and Ecosystem Specific Strategies**

  Key thematic Strategies include:

  - **National REDD+ Strategy:** The orientations for the elaboration of the future REDD+ strategy as contained in the REDD RPP (Readiness Preparation Proposal) validated by the World Bankproposes an in-depth analysis of the key drivers of deforestation and forest degradation leading to the loss of carbon stocks as well as biodiversity loss both at the national and local levels. A REDD+ Strategy is expected to be developed and adopted in 2013 to provide a response framework of critical importance to forest ecosystems and to ensure the payment of ecosystem services.

  - **National Strategy for Access and Benefit Sharing from the utilization of Genetic and Biological Resources (ABS)**. The newly adopted ABS Strategy of August 2012 provides guidelines for the development of a national ABS legislation pursuant to the Convenbtion on Biological Diversity (CBD), and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising form their Utilisation. Specifically, the National ABS strategy provides the framework for defining or identifying:
    - Administrative procedures for access to genetic resources and the fair and equitable sharing of benefits arising from their use;
    - Mechanisms for the identification and participation of the different stakeholders;

- Actions for the development of a legal and institutional framework for ABS;
- Actions/activities to be undertaken to strengthen the stakeholder capacity for ABS;
- Mechanisms for integration of the value of genetic resources and associated traditional knowledge into national development policies; and,
- Modalities of implementation of the strategy.

- **2010 Rural Sector Development strategy (RSDS)**

- The **National Integrated Water Resources Management Plan**: The elaboration of the national IWRM plan is a process that aims to develop a tool for sustainable development and management of the countries water resources. It is a participatory process that considers water management according appropriate water management units (catchments, sub-catchments, aquifers, etc) and according to different competing water uses. The process began in 2007 and it will be important that considereations for environmental flows for ecosystem services are prioritized in the action plan.

- National Great Apes Survival Plans
- National Bushmeat Strategy and Action Plan
- National Strategy for conservation of Elephants

2.3.1.4 Biodiversity-related Laws and Regulations

The legal landscape for the protection of biodiversity is based on the Framework Law for Environmental Protection (FLEM) and a myriad of laws and regulatory instruments in key production sectors. These include:

- The **1996 Framework Law for Environmental Protection (FLEM**) which defines the principles of precaution, preventive and corrective action, polluter pays, liability, participation and subsidiarity as key principles that underpin interventions and sector policies relevant to biodiversity protection and alignswith national approach to international standards. In recognizing the plurality of norms gives value to traditional knowledge and recognizes the right of local populations over this knowledge. This paves the way for involving local and indigenous communities and most importantly for the adoption of traditional knowledge and favorable cultural practices to inform measures in protecting specific ecosystems and species with which communities have had a relationship over ages for their livelihood. This fundamental instrument responds to the need for a coordinated and multi-institutional approach in the protection of biodiversity and provides an orientation for all interventions in environmental matters.

- **The 1994 Forestry, Wildlife and Fisheries Law** which regulates forest and wild life resources instituting principles and measures for sustainable exploitation and sets a target of 30% conservation of forest on the total national surface area with a representation of its ecological diversity. This law was established on the basis of the Forest Policy which ushered into legal norms the concept of decentralized and participatory forest governance involving communities, recognized customary access rights to forest resources and instituted the concept of sustainable management of biological resources. Decrees of implementation Regulatory instruments for its implementation include Decree No. 95/531/PM of August 23, 1995 setting the terms and conditions of application of the forest regime amended by decree No. 2000/092/PM of March 27, 2000; Decree No. 95/466/PM of July 20, 1995 setting the terms and conditions of application of the wildlife regime. The increasing threats to forest resources and evolving trends have led to the on-going forest law reforms and land tenure reforms.

- 2003 Bio-Technology Law laying down safety regulations governing the appropriation and handling of modern biotechnology in Cameroon,
- 1998 Law No. 98/005 Water Law, regulates all aspects related to water management and its relation to public health.
- 1999 Law No. 99/013 Petroleum code regulates oil operations and related environmental issues, prospecting, and research.
- 2001 Law No. 001 Mining Code, and its implementation decrees regulate land and marine mining activities in Cameroon. Several environmental issues are considered, notably those linked to marine exploitations.
- 2012 Gaz Code
- 2011 Loi No 008/2011 portant loi d'orientation sur l'amenagement du territoire et le Developpement Durable au Cameroun.

Several other biodiversity related laws and regulatory instruments have been developed

2.3.2 Major Biodiversity Related Programs and Projects

- **Forest-Environment Sector Program (FESP):** The 10 year program initiated in 1999 and implemented from 2005 -2010 was aimed at ensuring the conservation and sustainable management of forest ecosystems by promoting coherence in realising the objectives of the forest and wild life law, the green environment and strengthening institutional capacity. Designed in coherence with the National Forest Action Plan and the National Environmental Management Plan, the FESP had five components for the Environmental management of forest activities, Management of forest production and valorization of forest products, Conservation of biodiversity and valorization of wildlife resources, Management of Community Forests and Wildlife and a cross cutting component of Institutional Strengthening, Training and Research. FESP constitutes a major multi-donor bilateral support program for forest and wildlife biodiversity with significant achievements in reducing the loss of biodiversity, valorization of forest products and specifically the support in the revision of the present revised NBSAP. The second phase of the FESP is operational with major institutional changes of donor partners and executing institution approach.
- **National Program for Participation in Development (PNDP):** Instituted in 2005 within the national strategy for the reduction of poverty and the strategy for development of the rural sector, this program seeks to provide infrastructural, social and environment related support to local communities with a focus on pygmy communities and to ensure their effective participation in the decentralization and development processes. Major projects supported under this program include projects with a focus on sustainable land management and agro-sylvo-pasture systems, sustainable exploitation of medicinal plants.
- **PRECESSE PROGRAMME**: This environmental and social capacity building program for the energy sector was conceived with the aim of improving environment and social accountability and management in major investment projects with a focus on the energy sector. This project provided the opportunity to develop the capacity of key actors in order to mitigate the negative impacts of biodiversity loss from major infrastructural developments and to develop a transparent management of environmental risks for energy activities with the participation of local populations. Faced with management challenges, the project was short lived.

- **Global Environment Facility (GEF)**has supported projects in the biodiversity program area. Cameroon has to date been able to secure a total of 20 approved biodiversity projects, representing a GEF investment of US$ 46,628,206 with an additional $423,015,080 being leveraged in co-finance. See List of projects in Table 2.19

Table 2.19 GEF APPROVED NATIONAL PROJECTS (20)

GEF_ID	Project Name	Focal Area	Agency	Project Type	GEF Grant	Cofinancing	Status
85	Biodiversity Conservation and Management	Biodiversity	IBRD	FP	5,960,000	6,430,000	Project Closure
153	Preparation National Biodiversity Strategy, Action Plan and First National Report to the CBD	Biodiversity	UNEP	EA	300,000	0	Project Closure
427	Clearing House Mechanism Enabling Activity	Biodiversity	UNEP	EA	13,000	0	Project Closure
180	Enabling Activity for the Preparation of Initial Communication Related to the UNFCCC	Climate Change	UNEP	EA	265,000	70,000	Project Closure
772	Community Based Conservation in the Bamenda Highlands	Biodiversity	UNDP	MSP	1,000,000	2,090,980	Project Closure
1063	Forest and Environment Development Policy Grant (FEDPG)	Biodiversity	IBRD	FP	10,000,000	116,533,000	Under Implementation
1367	Support to the Implementation of the National Biosafety Framework for Cameroon	Biodiversity	UNEP	MSP	560,000	111,100	Project Closure
1976	National Capacity Self-Assessment (NCSA) for Global Environmental Management	Multi Focal Area	UNEP	EA	200,000	20,000	IA Approved
2023	Enabling Activities for the Stockholm Convention on Persistent Organic Pollutants (POPs): National Implementation Plan for Cameroon	POPs	UNEP	EA	499,000	20,000	Project Closure
3821	CBSP Sustainable Community Based Management and Conservation of Mangrove Ecosystems in Cameroon	Biodiversity	FAO	FP	1,733,180	3,700,000	IA Approved
4084	CBSP Conservation and Sustainable Use of the Ngoyla Mintom Forest	Biodiversity	IBRD	FP	3,500,000	6,500,000	IA Approved
4641	Disposal of POPs and Obsolete Pesticides and Strengthening Sound Pesticide Management	POPs	FAO	FP	1,710,000	7,548,000	PPG Approved
4800	Sustainable Forest Management Under the Authority of Cameroonian Councils	Multi Focal Area	FAO	FP	3,573,330	16,195,000	PPG Approved
5060	Developing Core Capacity for MEA Implementation in Cameroon	Multi Focal Area	UNEP	MSP	960,046	1,167,000	PIF Approved
4785	Promoting Investments in the Fight Against Climate Change and Ecosystems Protection Through Integrated Renewable Energy and Biomass Solutions for Productive Uses and Industrial Applications	Climate Change	UNIDO	FP	2,000,000	10,000,000	Council Approved

GEF_ID	Project Name	Focal Area	Agency	Project Type	GEF Grant	Cofinancing	Status
5210	Sustainable Farming and Critical Habitat Conser**423,015,080**vation to Achieve Biodiversity Mainstreaming and Protected Areas Management Effectiveness in Western Cameroon SUFACHAC	Biodiversity	UNEP	MSP	1,716,900	7,000,000	PIF Approved
5263	Enhancing the Resilience of Poor Communities to Urban Flooding in Yaounde	Climate Change	AfDB	FP	4,032,000	145,000,000	Council Approved
4674	Support to Cameroon for the Revision of the NBSAPs and Development of Fifth National Report to the CBD	Biodiversity	UNEP	EA	205,750	230,000	CEO Approved
2549	Sustainable Agro-Pastoral and Land Management Promotion under the National Community Development Program Support Program (PNDP)	Land Degradation	IBRD	FP	6,000,000	92,000,000	Under Implementation
3651	BS: Development and Institution of A National Monitoring and Control System (Framework) for Living Modified Organisms (LMOs) and Invasive Alien Species (IAS)	Biodiversity	UNEP	FP	2,400,000	8,400,000	CEO Endorsed
	TOTAL				**46,628,206**	**423,015,080**	

Source: http://www.gefonline.org/projectListSQL.cfm

Cameron has furthermore benefited from GEF investments as a participating country in 18 Regional approved projects and 12 Global approved projects funded.

2.3.2 INSTITUTIONAL FRAMEWORK

Post 2000 has been an era of profound modification of the institutional landscape for biodiversity protection as relates to state and non-state actors.

2.3.2.1 State Institutions

Focal Institution for Biodiversity: The Ministry of Environment, Protection of Nature and Sustainable Development (MINEPDED) is the focal institution for biodiversity. The split in 2004 of the ex- Ministry of Environment and Forest (MINEF) led to the creation of two separate entities: The Ministry of Environment and Protection of Nature (MINEP) charged with the coordination of the development and follow up of environmental policy and the Ministry of Forest and Wildlife charged with the development and implementation of the forest and wild life policies. The MINEPDED sector plan adopted in 2013 is made up of 4 intervention programs with Biodiversity as a key program.

The designated National Focal Points for the Convention of Biodiversity, the UNFCCC, UNCCD, the Cartagena Protocol, the ABS Intergovernmental Process and the Focal Point for GEF are all seated in MINEPDED charged with the national coordination on the implementation of their respective international instruments

Sector Ministries: Several ministerial departments are charged with implementing relevant sector programs.

Coordination Structures: In compliance with the provisions of the Framework Law, several consultation and coordination organs relevant for the protection of biodiversity have been instituted i.e, the National Consultative Commission for Environment and Sustainable Development with regional level commissions instituted; the Inter-Ministerial Committee for the Environment charged with ensuring the collaboration of all sectors in the sustainable management of natural resources; the National Fund for Environment and Sustainable Development charged with centralizing all funds collected for the realization of environmental programs and projects.

Partnership agreements between MINEPDED and several Ministries are being developed for effective execution of biodiversity related programs and projects i.e the model Agreement with the Ministries in charge of Agriculture (MINADER), in charge of Research (MINRESI), in charge of higher education (MINESUP) for the execution of the Biosafety project. MINEPDED within the decentralization process is increasing deferring its responsibilities to several territorial decentralized units for the protection of biodiversity such as the SAHEL VERT Project and the project on Invasive species specifically Water Hyacinths.

Table 2.20 : Key Institutions

INSTITUTION	INSTRUMENT OF CREATION	MISSION
Key State Institutions		
MINEPDED	Decree N° 2011/408 du 09 December 2011.	Responsible for the elaboration and putting in place of national policies in matters of the environment and the protection of nature in the perspective of sustainable development and thus coordinates the policy/strategy development and follow up for biodiversity, Coordination and follow up of interventions for regional and international cooperation (MEA) in matters of biodiversity in collaboration with the Ministry of External Relations and other concerned Administrations ; - Follow up of major projects to ensure environmental compliance
MINFOF	Decree N° 2011/408 du 09 December 2011.	Responsible for the elaboration and implementation of national policies in matters of forestry and wildlife and thus charged with the management of protected areas, forests in the national domain and wildlife. Has supervisory authority over the National Agency for the Development of Forests (ANAFOR) and the National School of Water and Forests, National School of wild Life National Focal Institution for CITES and CMS
MINADER	Decree N° 2011/408 du 09 December 2011.	Responsible for the elaboration and implementation of national policies in matters of agriculture and rural development and thus charged with the Conception of strategies to guarantee food security, ensure the improvement of production in the agricultural sector. Has supervisory authority over Agricultural Development Authorities, Agricultural Plantations
MINEPIA	Decree N° 2011/408 du 09 December 2011.	Responsible for the elaboration and implementation of national policies in matters of fisheries, livestock and development of animal and aquatic industries thus charged conception and implementation of strategies and research to increase production and output in the sectors of livestock and fisheries. Has supervisory authority over the Corporation for the Development and Exploitation of Animal Products (SODEPA) ; Mission for the

		Development of Maritime Artisanal fishing (MIDEPECAM) and the Laboratoire National Vétérinaire (LANAVET).
MINTOUR	Decree N° 2011/408 du 09 December 2011.	Responsible for the elaboration and implementation of national policies in matters of tourism and leisure and thus charged amongst others with the inventory and implementation in value of touristic sites , the promotion of amusement and leisure parks, the elaboration of norms in hotels, restaurants, and leisure sites;
MINRESI	Decree N° 2011/408 du 09 December 2011.	Responsible for the elaboration and implementation of national policies in matters of scientific research and innovation and thus charged amongst others with coordination and control of scientific research activities in collaboration with all the national economy sectors, ministerial departments and interested organizations ; -the follow up of research in the domain of traditional medicine in collaboration with the Ministry of Public Health and the concerned Ministerial Departments Has supervisory authority over IRAD created by Decree No. 2002/230 du 6 September 2002 as Research Institute charged with the promotion of agricultural development and to assure food security and reduce poverty.
MINEPAT	Decree N° 2011/408 du 09 December 2011.	Responsible for the elaboration and implementation of national policies in matters of planning and regional development. Charged with the development and follow up of the National Plan for Growth and Employmnet
MINDUH	Decree N° 2011/408 du 09 December 2011.	Charged with land planning
MINEE	Decree N° 2011/408 du 09 December 2011.	Charged with the elaboration and implementation of national policies relating to the production, transportation and distribution f water and energy. Has supervisory authority over CAMWATER the water corporation, EDC the electricity corporation, AER the Electricity agency, SONARA the oil refinery corporation
MINIMIDT	Decree N° 2011/408 du 09 December 2011.	Charged with the elaboration and implementation of the mining and industrial policy and the development of strategis for technological development in the different sectors of the national economy
Regional State Institutions		
COMIFAC		Aims at decision-making and coordination of sub-regional action and initiatives pertaining to the conservation and sustainable management of the Congo Basin forests.
National NGOs Institutions		
CED		to contribute to the protection of rights, interests, culture and aspirations o indigenous and local forest communities in Central Africa, whilst promoting environmental justice and the sustainable management of natural resources in the region.
NESDA-CA		To strengthen individual and institutional capacities in planning, development, execution and monitoring of policies and related programs of action aimed at promoting environmental good governance and sound management of natural resources of the sub-region for the sustainable livelihood of its inhabitants.

BDCP-C		To link biodiversity conservation with economic and health needs of local people.
CBCS		The conservation of biological diversity through the protection of Birds and Natural Habitats,as well as the promotion of wildlife study and enjoyment for the benefit of people.
CERUT		to move towards a humane and environmentally sustainable world, free from poverty, injustice and degradation
WHINCONET		. Promote sustainable pratices in biodiversity and natural resource management.
RAFM		to define, elaborate and manage a regional project of work for model forests, strengthen partnership, regional communication, exchange of knowldge, Capacity building and financing existing model forests, promoting local governance and participation of all institutions involved in territorial management
CTFC		. To train and inform local elected officials and their collaborators on community management and to community forests.
REPAR-Cameroon		To guarantee good governance in the sustainable management of Central Africa forest ecosystems.
GVC		To promote environmental governance and sustainable development in order to analyse and find solutions to national problems.
GWP		Global Water Partnership
International NGOs		
CARPE		to reduce the rate of deforestation in order to fight climate change.
WWF		to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature byConserving the world's biological ddiversity;Ensuring that the use of renewable natural resources is sustainable
SNV		To preserve the environment and improve the living conditions of populations.
IUCN		To influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.
CIFOR		To conserve forests and improve on the living conditions of inhabitants of tropical countries.
Birdlife International		To conserve wild birds, their habitats and global biodiversity by working with people towards sustainability in the use of natural resources.
WCS		

2.3.2.2 Non State Actors

Technical cooperation partners have made significant contributions through the support of biodiversity related national programs and projects, environment programs and other relevant sector programs as highlighted above. Bilateral support constitutes 75% of cooperation aid.

Civil society organisations including NGOs intervening in biodiversity programs and projects have been on the increase carrying out sensitization, training and evaluation. Their proximity with the local community have enabled them with a strong mobilization capacity of local and indigenous communities to ensure their involvement in biodiversity related activities

The increasing awareness and involvement of private sector actors in biodiversity related programs has been obligated by the mandatory regulatory provisions for the carrying out of Environmental and Social Impact Assessments for major projects by promoters. This has been exacerbated by increase in controls and inspections to ensure respect for approved environmental management plans for private sector initiatives. An increasing number of industries are now disposed of specific services within their set-ups in charge of the environment. The establishment of an Environmental Unit within the Cameroon Business Group (GICAM), facilitates the involvement of the private sector in major biodiversity related programs and linkages with key institutions including MINEPDED, MINFOF, MINADER, MINEPIA, MINTOUR. This is further strengthened by the requirementf for EIA before the installation of private sector activities that impact on the environment, and Environmental Audits during the implementation of the private sector activities.

2.4 TRENDS IN STATE OF BIODIVERSITY

2.4.1 POSITIVE TRENDS

Using the 2000 adopted NBSAP as a baseline, positive trends in the state of biodiversity and efforts to conserve and ensure sustainable use and promote an equitable sharing of the benefits derived have been identified in the state of species, conservation efforts and policy development.

Box 2.3 Cameroon A Gold Mine of Science

Cameroon ranks 16th in diversity of mammals and nearly half of the bird and mammal speicies of Africa are present in Cameroon's forest.

The increasing discovery of species in Cameroon has led to the describption of the national domain as a gold mine for science

- **A Gold mine of Science in Species**

Cameroon's rich biodiversity accommodates about:

- 8300 plant species
- 335 mammal species. Cameroon ranks 16th in the diversity of mammals. (Vie et al, 2009)
- 542 fresh and brackish water Fish species
- 913 bird species. Nearly half of the bird and mammal species of Africa are present in Cameroon forests (Birdlife International 2006)

Many more species are discovered each year making the domain a gold mine for science (Onana and Cheek, 2011).

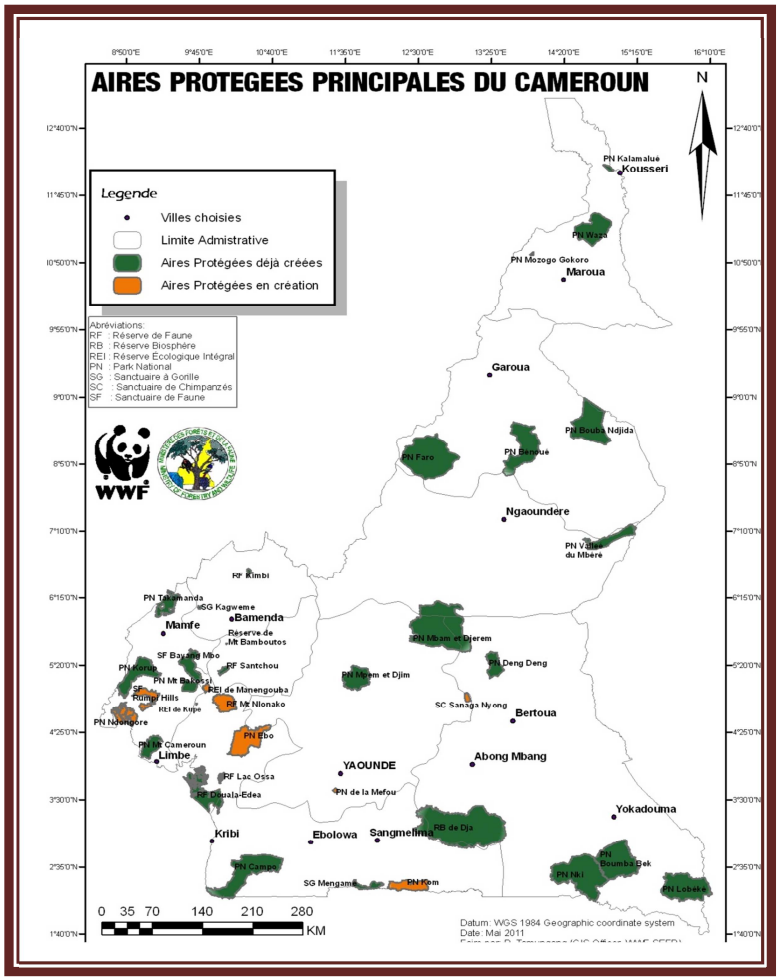
- **Biodiversity Hot Spots**

Protected areas as major biodiversity hotspots are home to around 90% of the country's animal species, 95% of plant species, close to 65% of habitats and 80% of the country's ecosystems. (MINFOF)

The trend in protected areas depicts an increase in the creation of protected areas.

- There are 30 PAs created in Cameroon totalling 3.659 199,07ha (See Annex 1a)
- More protected areas are underway to be created as shown in the table 2.22 below. The distribution is as follows: National Parks (60%), Faunal Reserves (14%), Sanctuaries (10%), Zoological gardens (10%) and Ecological Reserves (10%).
- Between 2000 and 2012 protected areas have almost doubled from 17 to 30 depicting an increase of 76.5%(See Figure 2.3).
- The creation of protected production areas increasedwith a total of 72 Hunting zones. (47 Hunting Zones and 25 Community Hunting Zones) determined by Decision No. 0177/D/MINFOF/SG/DFAP/SDVEF/ SC of 04 May 2013 establishing the official list of ZIG and ZIG GC. This covers 5 694 827,5 ha making 12,23% of the national territory.
- Total area involved in wildlife conservation is 9,159,135 ha amounting to 19,25% of the national territory.
- Community forests also increased significantly during the period 2004 - 2011 by 301 sites (roughly 1 million ha) and due in part by a simplification of the application and allocation process. *(Interactive Forest Atlas for Cameroon version 3.0)*

Box 2.4 National Protected area cover with ZIG and ZIGCG



- National cover of these protection and production zones areas enabled Cameroon to move closer towards the national conservation target of 30% of national territory.
- Most PAs fall within the Tropical Dense Humid Forest ecosystem (52.5%). Specifically in the forest area, from 2006 to 2011 protected areas increased in surface area by 8%, to 7.4 million ha (16% of total national land area) and many of which resulted from reclassification of forest reserves. *(Interactive Forest Atlas for Cameroon version 3.0)*

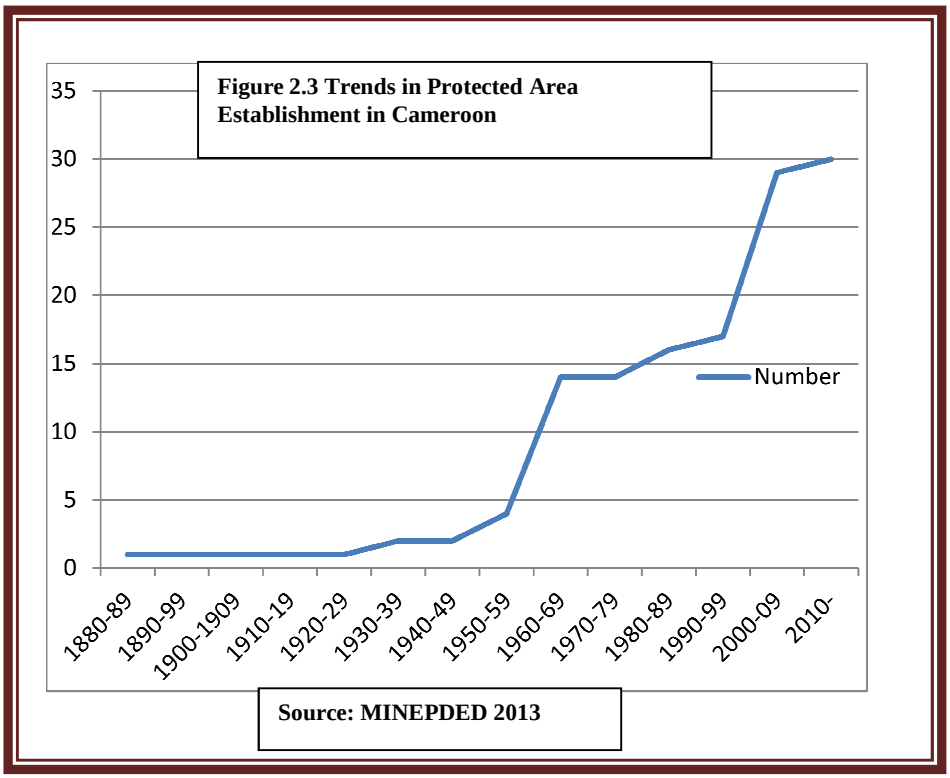


Table 2.21 : Protected Areas Being Processed to be Gazetted(hunting zones not included).

Nom	Surface area (ha)
1 Parc marin de Kribi	126 053
2 Parc National de Tchabal Mbabo	150 000
3 Parc national de Ndongore	230 000
4 Parc National de Kom	68 905
5 Réserve écologique Intégrale de Koupé	4 676
6 Réserve de Mt Bamboutos	2 500
7 Réserve écologique Intégrale de Manengoumba	5 252
8 Sanctuaire à Gorilles de Lom Pangar	47 686
9 Sanctuaire de Rumpi Hills	45 675
10 Sanctuaire de Sanaga Nyong	14
11 Réserve de Mont Nlonako	2500
12 Parc National d'Ebo	100 000
19 Parc National de Douala-Edéa	296 000
20 Parc National de Ma Mbed Mbed	58 359
TOTAL	**1 137 620**

- **Institutional Framework**

The Ministry in charge of the environment has undergone significant restructuring since 2000. Although MINEP was faced with structural and adaptation challenges after the 2004 split of MINEF into two ministries, the creation of a specific ministry charged with the environment provided the opportunity for a more focused attention on all aspects of the green environment and the coordination of biodiversity related issues which prior to had received limited attention. Again in November 2012, the mandate of MINEPDED was clearly defined to emphasize its supervisory mandate on issues of sustainable development. This resulted in the restructuring of the Ministry with establishment of new central level organs and regional organs to ensure effective supervision and control relevant for compliance with laws and regulations relating to the protection of biodiversity.

2.4.2 REGRESSIVE TREND

There is however, a regressive trend of great concern in the state of biodiversity.

- **Species**

From a compilation of data from Interactive Atlas, (Ajonina 2012) the regressive trend in species is depicted as follows:

- Cameroon's net annual deforestation rate is about 0.14 % (Duveiller er al 2008) which is about 270,000 ha/year, more than the area of Campo-Ma'an National Park (among the highest in the Congo Basin) (ITTO 2011).
- UNEP reports loss of about 3000 ha of mangrove and associated coastal forests in 20 years (1986-2006).
- 50% of forest habitat loss have been recorded in the north of Bamenda Highlands in 15 years (1988-2003), leading to average loss of species population of 30% in 100 years (Onana and Cheek, 2011).
- 815 species of flowering plants are threatened.
- Cameroon ranks 18th in number of threatened mammals (41 in 2009, up from 32 in 1996) (Vie et al, 2009).
- Two species are listed in Annex 1 of CITES: Marine Turtles and Crocodiles and Four species enlisted in Annex 2
- Genetic diversity is progressively lost through uncontrolled crossbreeding (Ibeagha et al; Fotsa et al) of farm animals.

More species (plant and animal) are threatened.

- ***Biodiversity Hot Spots***

- Biodiversity hotspots have received inadequate attention in terms of protection (Onana and Cheek, 2011. In consequncee protected areas have degenerated.
- Forest reserves dropped slightly, from 86 to 75, between 2004 and 2011, and their combined area has decreased by nearly one third (503,537 ha). Primarily a result of the recent conversion of forest reserves to other land uses *(Interactive Forest Atlas for Cameroon version 3.0)*
- An increasing destruction and fragmentation of mangrove ecosystem with mangrove loss of 30% from 1980 to 2006 (UNEP-WCMC 2007), and an estimated loss of 1.8% with more losses in the Wouri estuary

Box 2.5: Case Study: Results of Forest Monitoring in the Korup National Park (KNP)

Forest monitoring was carried out over a period of ten years (1990 – 2010) in a 50-hectare Forest Dynamics Research Plot in the KNP, SW Cameroon, sponsored by two USA organizations - the International Cooperative Biodiversity Groups (ICBG), the Central African Regional Programme for the Environment (CARPE), and the Cameroonian NGO –Bioresources Development and Conservation Programme (BDCPC) with the following results in terms of biodiversity:

- At the 50 ha forest monitoring plot in Korup National Park Cameroon, all standing stems above 1.0 cm were measured, mapped, tagged and identified (close to 90%).
- A re-census 10 years later indicates that the forest is on the decline. Mortality and recruitment rates are 73.3 and 61.2 stems ha^{-1} yr^{-1} respectively giving a net decline of 10.1 stems ha^{-1} yr^{-1}.
- The rare species seem to be affected most and some may even be lost without having been recorded or identified following any form of disturbance in the forest ecosystem.

Source: Chuyong et al. unpublished data

- Efforts in ensuring an effective management of Protected Areas remained insufficient with 12 Protected Areas representing 40% having national validated management plans. See Annex 1b. The management plan of an important Protected Area is yet the course of being developed while 6 PAs remain priority targets for the development of management plans. See Annex 1d and 1e.

Notwithstanding the country's importance in the world environmental arenas, the regressive trends in the state of biodiversity on the national territory can be attributed to multiple direct and indirect drivers that have negative consequences for the environment and human wellbeing - this situation is the subject of the analysis in the next chapter.

CHAPTER III

CAUSES AND CONSEQUENCES OF BIODIVERSITY LOSS

The regressive trend in the state of biodiversity on the national territory is attributed to multiple causes with negative consequences for the environment and human wellbeing. Understanding these causes and consequences is a prerequisite for the design of any strategic response to redress the degradation and loss in biodiversity.

3.1 CAUSES

The wide consultation in this process and assessment of data collected led to the identification of multiple causes of biodiversity loss and the categorization into direct and indirect causes is an option taken to ensure targeted planning with adapted response measures.

Direct causes identified highlight anthropogenic activities and natural processes as key drivers which exert direct pressure on ecosystems, habitats or species, resulting in loss of biodiversity. The findings from the assessment of data from ecosystem-specific consultations highlight the relative significance of the direct causes of biodiversity loss. Its variation from one ecological zone to the other with expected overlaps emphasizes the need to integrate specific ecosystem considerations in biodiversity national planning. In a further assessment specific attention is given to the diverse production sectors and the specificity of their activities with likely impacts on biodiversity.

The direct causes of biodiversity loss of a general nature are inextricably linked with each other and further with some or all of ecosystem –specific and sector-specific direct causes yet merit categorisation for planning purposes. Indirect causes as highlighted constitute processes and policies that drive major activities and thus indirectly underlie the activities that exert pressures resulting in biodiversity loss.

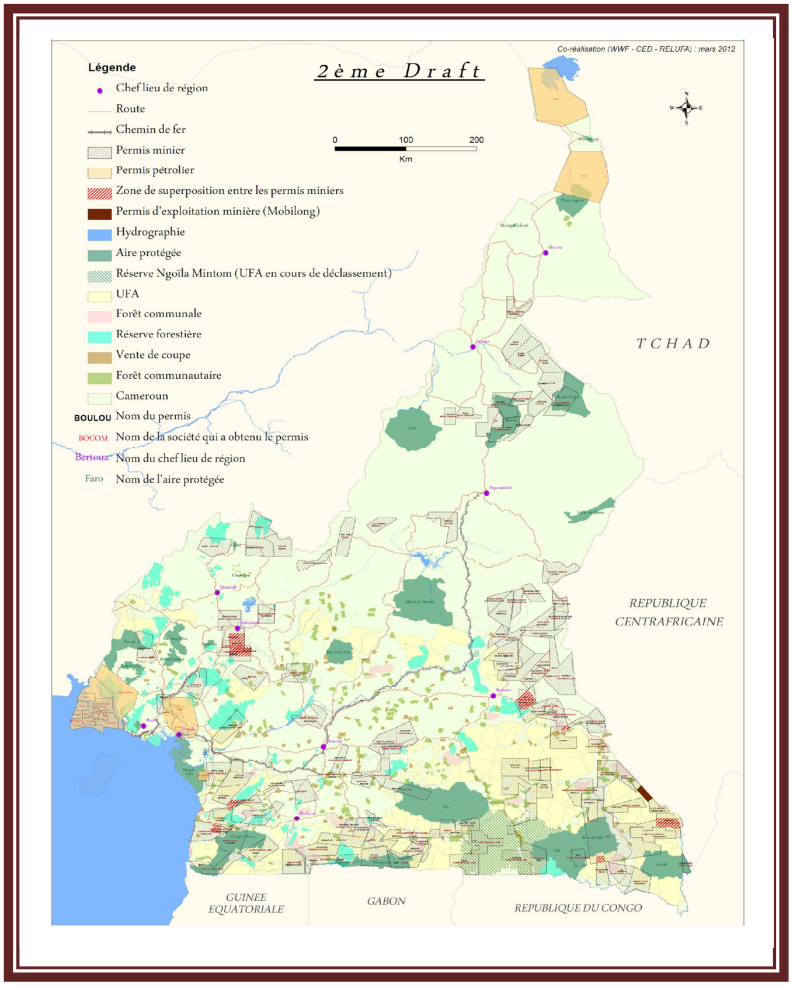
3.1.1 DIRECT CAUSES

3.1.1.1 General Causes

a) Land-Use Change.

In a system with an economy that depends on natural resources, the quest for land for agricultural development is one of the principal driving forces of biodiversity loss. Land use change resulting from industrial agriculture calls for an increasing conversion of forests, savannahs and even semi-arid lands to mono-culture plantations. The increasing demand for land, to extend area under mono-crops and/or open new plantations over thousands of hectare for oil palms, rubber, coffee, cocoa, and tea plantations call for the clearing of vast expanse of vegetation and change local biodiversity balances with the risk of eliminating certain fauna and flora while at the same time introducing invasive species of predators. Large-scale agro plantations with new expansions of land include PAMOL a palm plantation which has established a new extension of approx.12000 ha and HEVECAM a rubber plantation is extending its plantation to four new blocks totaling 18,889 ha. Herackles Farm is establishing a new palm plantation in an area of approx. 60000 ha and conflicts with Government in the establishment of the plantation led to the suspension (2013 MINFOF Decision) of the plantation and review of accord pending.

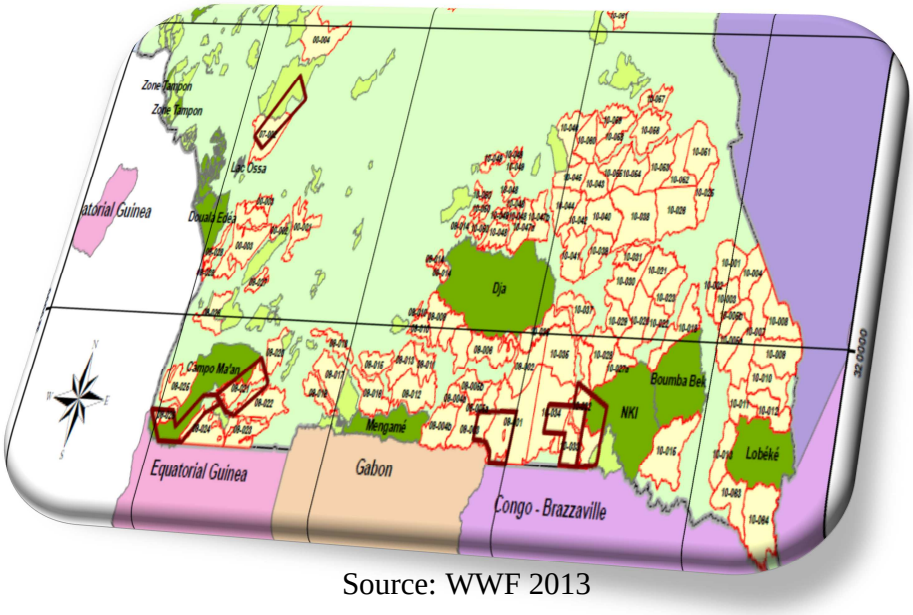
Figure 3.1MAP of overlap Protected Areas – Mining Permits
Source MINFOF 2012



Unsustainable agricultural/pastoral expansion to address increases in the demand for food crops and meat will increase the level of land use change. This is especially the case with the slash and burn/soil-burning shifting cultivation agriculture commonly practiced by small-holder extensive agriculture, the expansion of grazing land and unsustainable nomadic grazingin local communities.
Other land-use changes arise frommineral exploitation in biodiversity-rich locations, heavy earth-moving public works (roads, dams, deep sea ports, dykes, and urban development) lead to ecosystem and habitat degradation.

The poor coordination of the land use plan for the forest and coastal ecosystem and the absence of a land use plan for other ecosystems constitute the basis for multiple conflicting uses. Major conflicts are conflicts of mining against logging concessions, conflicts of grazing zones against agricultural land, conflicts of farming or mining against protected areas, etc. In the mining sector a total of 494 mining permits, 90 exploration permits, 4 operating permits, 150 quarry mining permits and about 250 artisanal mining authorizations have been issued as of 2011. 75% of these permits are within the Tropical Dense Humid Forest Ecosystem wherein about 30 permits overlap with 12 protected areas and dozens more are located in the immediate vicinity of protected areas. The wanton coordination here leads to conflicts with national conservation objectives. This presents a significant threat, with a likely acceleration of loss.

Box 3.1 Interface between CMC permits and Parks, UFMs, Local council forests in Tropical forest ecosystem



Source: WWF 2013

of biodiversity in important protected areas, including Korup National Park, Dja World Heritage Site, Nki National Park and Bouba N'Djijda National Park, which constitute major biodiversity hotspots and Cameroon's natural heritage (*Schwartz et al 2012*).

b) The Unsustainable Exploitation of Natural Resources.

The unsustainable exploitation of natural resources which includes overexploitation and the use of unsustainable practices constitute a major driver of biodiversity loss.

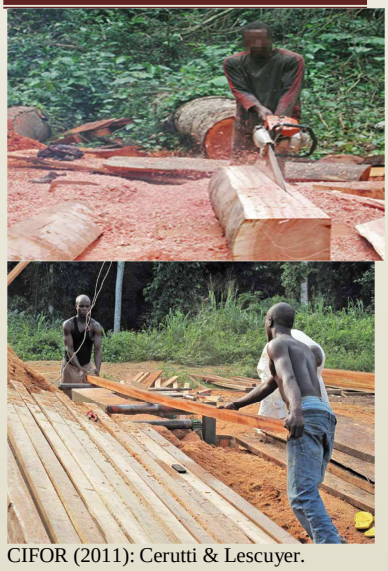
Although formal logging in the forest sector is increasing under sustainable management programs with certification approaches, the use of unsustainable practices in forest concessions results in the destruction of non-utilized species and account for a 1% annual forest loss. *(FAO 2006).*

Timber and Non timber forest products with a high demand in international trade are under pressure and are a determinant for loss of biodiversity. In the timber industry, only 70 species out of approx 2000 species (400 species of trees of adult age attain 60 cm diameters) are commercialized. The selective exploitation practice is focused on species of very high value which are the sapelli, doussié, sipo, iroko, padouk, ayous, azobé, assamela. A high concentration in exploitation is principally on two species: Ayous and Sapelli which make up over 60% of the total exploitation. *(République du Cameroun, Ministère de l'Économie et des Finances Audit économique et financier du secteur forestier au Cameroun, Août 2006*). High demands and pressures on specific non-timber forest products have also led to over exploitation and unsustainable harvests of a wide variety of medicinal and aromatic species such as *Prunus africana* for medicinal purposes and *Nyetum garcinia* for commercial purposes, presenting threats of depletion. The Prunus African was suspended from international trade by the European Union in 2007 due to pressure by pharmaceutical in search of stock for primary material. Cameroon has two species on the Annex 2 of CITES for which access is subject to special permits and these include the *P.africana and P.élata or Assamela.*

Generally unsustainable fish harvest in all water bodies with the use of inappropriate fish nets deplete fish stock. Unsustainable maritime industrial fishing specifically involves trawling and dragging that destroy habitats and deplete species populations - the repetition of such activities delay or prevent habitat recovery. *(Ajonina et al. 2009; Feka and Ajonina, 2011).* Decrease in fish stocks and different species are recorded with decreasing production of 10% in industrial fish production over the period 1995 – 2000. On output, a drop in industrial fishing is observed from 18788 tons a year in 1970 with 35 fishing vessels to 9000 tons in 2012 with 62 fishing vessels – owned mainly by foreign fishing fleets.These decreases are linked with overexploitation of the resources, as a result of fishing with shrimpers along the years which has been active in nurseries zones of fish. (*MINEPIA 2012 reports).* Artisanal maritime fishing has 24000 artisanal fishermen (*Folack, Njiforju, 1995*) with increasing pressure on the ecosystem resulting from the use of unsustainable practices.

Illegal exploitation of wildlife species is also of increasing concerns. The excessive poaching for food and commercial purposes is a threat to terrestrial and aquatic mammals and avifauna. Commercial bush meat trade is increasinglyillegal with great threats to wildlife species. These activities are carried out in violation of prohibitions exemplified by the 2012 massacre of more than two hundred pachyderms in Bouba Ndjida. Illegal Commercial hunting and the bushmeat trade plague Cameroon's critically endangered gorillas, chimpanzees, forest elephants, and other imperiled species. Although the national wildlife law dates back to 1994 and strictly prohibits the

Plate 3.1 -3.2 Small-scale timber exploitation



CIFOR (2011): Cerutti & Lescuyer.

Plate 3.3 -3.4 Small Scale commercialiasation in dosmetic market

CIFOR (2010, Pye-Smith

Plate 3.5- 3.6: Boys holding antelope and squirrel in Bertoua, SE Cameroon;

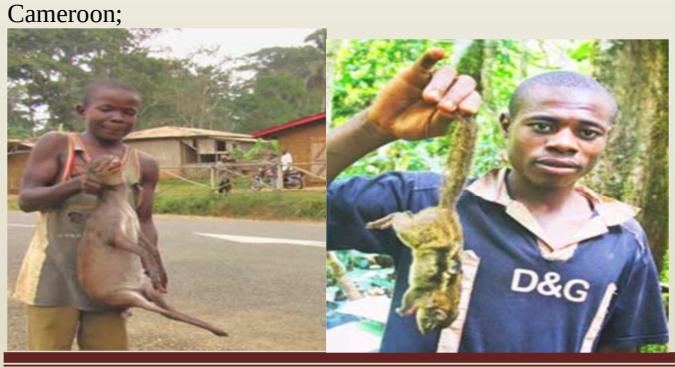


Plate 3.7: Bush meat on way Plate 3.8: Women vendors sell bush meat to town marketstews at market near Yaounde.

sale and trafficking of endangered species, the area and number of people involved in the illegal trade make conventional law enforcement virtually impossible. Many rural communities hunt bushmeat, both for food and sell for a living. There is a direct link between logging development and poaching activities carried out in violation of prohibitions. As populations continue to grow in cities as well as in forest logging concessions and mining camps, demand for wild meat rises. Sales of bushmeat also fetch a higher price as new urban markets are established, stimulating increased trade. There is a lack of awareness on the scale of the trade—and the consequences of such unsustainable wildlife exploitation.

Plate 3.9: Large-scale poaching for elephant ivory.
Source: WWF 2010

Illegal exploitation of timber is one of the most significant drivers of biodiversity loss in forest ecosystem. Timber exploitation in the informal sector for domestic markets is also fraught with illegal practices. Exploitation by chain saw operators is largely illegal and destined to supply local and regional markets (see Plates below.) 3 million cubic metres of forest are logged annually with 25-30% removed illegally to domestic markets.(*Topa et al, 2012*).

Habitat destruction is the most significant cause of biodiversity loss with removal of vegetation alters the availability of food and shelter for wildlife. Unsustainabletourism, logging, mining, extractive industries, affect biodiversity by changing species composition and structure, particularly in protected areas or areas that are not formally protected but that contain a high level of species biodiversity. Management or capacity is inadequate to regulate mining and logging activities.

Bio-piracy through research for development is increasingly of great concern with the illegal exploitation and transfer of plant/animal material and associated traditional knowledge on the use to foreign research institutions and subsequent commercialization of research findings and discoveries.

c) Pollution

Plate 3.10-3.11Urban waste disposal

Plate 3.12:Petroleum washed off Isongo beach West coast

Plate 3.13 -15: Sludge from Agro-Industry

Different sources and types of pollution that contribute to the degradation of all ecosystems and loss of biodiversity are identified. Towns and cities lack adequate waste disposal mechanisms. As a result, there is indiscriminate discharge of industrial effluent domestic/household waste, hospital waste, laboratory waste and sewage into surface water bodies. Pollution from urban waste is in the increase from human activities in urban nodes of Cameroon such as Douala, Yaounde, Buea, Limbe, Garoua, Maroua, Bamenda and Bafoussam. The poor disposal of waste generated by expanding urban cities presents a major threat. Wastematerial that is dumped in freshwater systems pollute portable stream and river waters. See Plates below**.** It is estimated that in developing countries like Cameroon, an average of 93% of all domestic sewage and 75 % of all industrial wastes are discharged into surface waters. This is evident in Douala by the dark colour of stream water and the pungent, obnoxious smell that emanates from streams as they flow across the town into equally polluted rivers like the Dibamba and Wouri, which become unfriendly to biodiversity (fauna and flora) and for human uses. Such anthropogenic pollution of surface and groundwater freshwater resources has been reported in Douala (*Takem et al. 2010*), Yaounde (*Fantong et al. 2013*), Maroua (*Fantong et al. 2010*) and Ndop (*Mendjo et al.2013).*

Box 3.2 Plastic Waste Obstructs Mfoundi River - Yaounde

Photo : Thomas Tata 2012

In Figuil (neighbourhood of Garoua), and Limbe, where a cement production factory, and oil refinery are respectively located, air pollution which can be recycled into the freshwater bodies is eminent.
Pollution from offshore and land based sources in the marine coastal ecosystem has significantly contributed to the degradation of aquatic environment, the soils, land, air and their biodiversity components. Major drivers constitute the dumping into the sea, estuaries and creeks ofwaste material from petroleum exploration and exploitation activities (plate 3.5 below), industrial and manufacturing activities, activities of extractive and construction industries, the use of non-homologated pesticides and the abusive use of other chemicals by agro- industrial plantations, unsustainable industrial and artisanal fishing activities.

Agro-industries do not comply with regulations which obligate buffer zones to be created around/by water bodies while planting. Plates 3.17 and 3.18 illustrate the planting of oil palms by agro-industries close to human settlements and water bodies. The use of inorganic fertilizers and application of plant protection chemicals on the industrial crop threatens human health, pollutes the soil, the freshwater of rivers and the sea in the area.
Palm oil processing waste (sludge) from agro-industrial oil mills is poured into a nearby stream from where villagers filter the sludge to extract palm oil waste which is then sold for soap production. What remains of the sludge after oil extraction flows into the sea. See plates below

Again solid waste from the oil mill, made up of palm kennel shells and palm nut chaff are dumped nearby and burnt causing air pollution in the area – see Plates 3.12 and 3.13 below.

Plate 3.16- 3.17 Air pollution from agro-industrial waste

Photos: Thomas Tata (2010

d) Climate Change.

Biodiversity and climate change are closely inter-linked with each impacting upon the other. The principal interactions from properties of ecosystems are in the form of energy flow, nutrient cycling and interactions. These interactions include carbon sequestration, green house gas emissions and genotype – environment interactions. Biodiversity is threatened by climate change nationally where this exacerbates the effects of stresses, including habitat fragmentation, loss and conversion, over-exploitation, invasive alien species, and pollution. Land use change resulting in forest degradation and deforestation accounts for over 51% of emissions of green house gases while Agriculture accounts for 17% emissions. (MINEF 2001 cited Cameroon REDD-PP 2012)

Fragile ecosystems especially in the semi-arid, savannah, freshwater and marine/coastal ecosystems have become vulnerable to climate change. The IPCC (2001) defines 'vulnerability' as the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Cameroon has experienced a temperature rise of 0.2^{o}C from 1970 to 1990 and 0.4^{o}C from 1990 to 2002. This phenomenon is accentuated in the savannah and semi-arid regions with values attaining 0.4 and 0.6^{o}C, respectively. Inversely rainfall amount has dropped by -10% in the Southern regions and -20% in the Northern regions. Concurrently, these have caused the rainfall-related discharge of rivers to drop by -15% and -35% in the Northern and Southern regions respectively (*Sighomnou 2004*).

Plate 3.18-3.19: Coastal Erosion Kribi
Source:– Photo by Thomas Tata (2012)

but at the same time biodiversity resources can reduce the impacts of climate change on population and ecosystems.

Climate change will lead to sea level rise. River discharge and sea level rise will lead to different types of responses from different fragile ecosystems. In the coastal ecosystem some of the most important impacts are observed on the mangroves of the Cameroon Estuary.

Box 3.3 IMPACT OF SEA LEVEL RISE IN THE CAMEROON ESTUARY MANGROVES

Flooding and Erosion: Increased flooding and erosion are the two main mechanisms by which land is lost as a result of sea level rise.

Increased erosion results in removal of mangrove substrate above mean sea level and deposition offshore (*Ellison, 1992*) leading to a gradual retreat towards inland of the mangrove. As trees recede, more rapid erosion would occur resulting in the formation of small cliffs in the seaward front. The effects on the Cameroon Estuary mangroves will be more important since the zone is largely dominated by muddy coasts. Predicted sea level rise will also lead to increased efficiency of wave erosion, with sediment removal from the upper part of the tidal spectrum and deposition in the lower part. This will destroy the few sandy beaches in the mangrove e.g Cap Cameroon, Kange fishing.

The simple inundation model of IPCC was applied to asses land loss due to flooding. Taking into account the sea level change and the micro-topography of the mangrove, the mean water level mark corresponding to the selected sea level rise scenarios is shifted inland. The predicted land loss was evaluated for 2025, 2050 and 2100 time horizons using corresponding sea level rise values and is expected to vary between 4950 ha (4.5% of total area) for a sea level rise of 20cm, and 33,000 ha (30%) for a maximum sea level rise of 90cm. The mangrove zone will be affected by increased flood frequency in the event of any rise in mean sea level. In general, any low – lying coastal area that faces permanent flooding will first experience an increased risk of flooding with sea level rise. With increasing sea level, more areas of the mangrove will be lost to flooding.

Sedimentation: The mangroves environment receives large volumes of allochthonous sediments from inland rivers. If there is significant increase in rainfall patterns in the river catchment, vertical accretion of sediment will keep pace with predicted sea level rise. Tidal activity within the Cameroon Estuary affects sedimentation rates. Increased tidal currents with expected sea level rise will therefore promote higher sedimentation rates in the mangrove zone.

Salt Water Intrusion. The assessment of salt water intrusion in rivers and estuaries usually is a difficult task due to scarcity of data. Regression analysis performed on maximum salinity recorded in the River Dibamba at Japoma which is about 35km to the estuary, projects up to 30% increase in salinity.

e) Introduction of non-native invasive species (invasive alien species).

Invasive species can be defined as species that have overcome geographic or reproductive barriers and which threaten ecosystems, habitats or species with economic and/or environmental harm. Invasive species have been cited as being the second most important threat to global biodiversity loss, after land use change (*Allister Slingenberg, et al October 2009*).

In Cameroon, both Native and Alien Invasive Species (e.g., water hyacinth in inland freshwaters, striga weed, zoonosis, locusts, and various types of caterpillars) alter abiotic environments, some become diseases that introduce pests and particularly targeting native species with a lower reproductive potential that easily succumb to competitors or predators, and contribute to species extinctions in all ecosystems. The outbreak of emerging or re-emerging zoonosis leads to the interaction between people, wildlife and domestic animals, causing health problems. Proliferation of Alien Invasive Species, include for example, theNypa palm (*Nypa fructicans*) that invade the mangroves of Rio Del Rey area, Nypa palms are amongst the most rapidly growing threats to biodiversity in the coastal ecosystem and arealmost replacing the mangrove species Avicennia spp. in the Bakassi areaand *Tithonia diversifolia* in the western region of Cameroon.Other categories of species invasion come from human-assisted transportation and release of species from ballast water to the environment where they did not previously exist.

f) Natural Disasters

The trend in the loss of biodiversity is exacerbated by recurrence of natural disasters such as floods and sedimentation which destroy aquatic life and impose sufferings on populations in the semi arid and savannah ecosystems. Volcanic activity during 1999/2000 on Mt Cameroon resulted to volcanic eruption which burnt down hundreds of hectares of vegetation destroying mountain and coastal biodiversity around Bakilindi village in the South West Region. Also recent pollution in Lake Barombi Mbo near kumba that resulted from wind action caused rich heavy muds in the bottom the lake to rise into the waters resulting to oxygen deprivation in the surface waters that caused fish to die and rendering the population without potable water for many months (*Chiambeng GY pers comms, 2012*).

3.1.1.2 Ecosystem specific causes

Although most ecosystems are impacted by the general causes of biodiversity loss, specificities in characteristics, biodiversity resources and services offered subject each ecosystem to diverse activities with pressures of a specific nature resulting in loss of species and the degradation of the ecosystem.

a) Marine and Coastal ecosystem

The Marine and coastal ecosystem is increasingly under specific threats of pollution, mangrove destruction and fragmentation and coastal erosion which render the ecosystem more vulnerable.

Plate 3.20: Lavaburnt Vegetation Mt Cameroon

Source: www.caboose.org.uk

Pollution: Pollution as a major cause for loss of marine and coastal biodiversity is driven by land and marine based activities from increasing exploration and exploitation of hydrocarbons, large scale agricultural installations, exploding infrastructural investments of the deep seaport and railway and other industrial activities in this zone. Toxicchemicals and nutrient pollution are discharged by large scale agricultural investments. A constant increase in port activities with a potential increase from the Limbe and Kribi deep sea ports under construction and the railway under construction linking the Mbalam Iron Ore quarry to the Kribi port present significant threats to the coastal and maritime ecosystem. Transformation industries contribute 21.6% to the PIB *(World Atlas 2000)* with those located in the coastal zone covering 60% of national production for food, textiles, chemical, metal and other industries. Solid and liquid waste generated and poorly managed significantly pollutes this fragile environment. The practice of agro-industries involves monoculture plantations resulting in the large destruction and loss of several species endemic to this ecosystem. The rapid demographic increase in the coastal zone exacerbates the situation of urban waste generated with polluting effects.

Figure 3.2: Mangrove forest trend (1980 – 2006).
Source: UNEP-WCMC 2007.

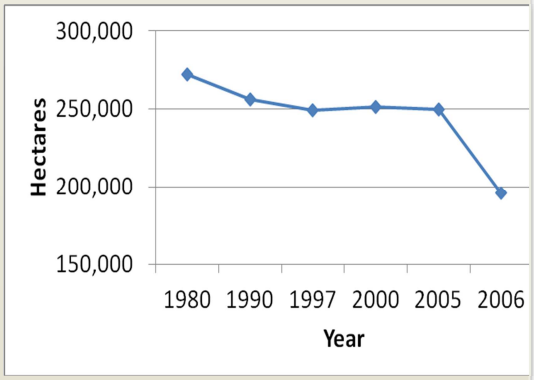
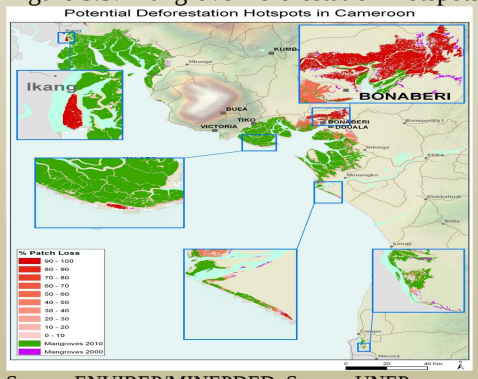


Plate 3.21: Mangrove destruction bakassi

Figure 3.3: Mangrove Deforestation Hotspots



Source: ENVIREP/MINEPDED: Source: UNEP

Mangrove Destruction: Cameroon's coastal zone is specifically subject to increasing destruction and fragmentation of mangrove ecosystem See Figure 3.3 below. Highly fragile mangrove ecosystems which cover 200 000ha and constitute major spawning ground for fish species are under threat from the destruction of mangroves for fish smoking and construction purposes. 28km of the mangroves in the Wouri estuary was reportedly destroyed. Other causes include, the human-assisted transport and release of species to environments where they did not previously exist

A current report produced by UNEP on the mangrove of Central Africa shows that the overall rate of mangrove loss in Central Africa from 2000-2010 is estimated at 1.8% with an average of approximately 685 ha of mangroves per year. In Cameroon the estimated loss is 1.8% with more losses within the Wouri estuary**.** *(Ajonina et al., 2013).*

Coastal erosions from climate change, unsustainable clearing of coastal vegetation, floodings, etc…has had devastating impacts on the marine and coastal ecosystem with highly eroded coastal beaches in Kribi and Limbe.

b) TROPICAL DENSE HUMID FOREST ECOSYSTEM.

Several assessments and studies seek to determine the deforestation rate for the national forest estate. According to FAO (2006), the annual average deforestation rate in Cameroon for the 1980–1995 period was 0.6%, or a loss of close to 2 million ha. The rate reportedly rose to 0.9% for

the 1990–2000 period and reached 1% between 2000 and 2005. However, recent work by Duveiller *et al.* (2008), used in de Wasseige *et al.* (2009), found the FAO figures to be too high and estimate the average net annual deforestation rate at 0.14% for the 1990–2000 period, with a gross average deforestation rate of about 0.2%. These figures suggest that Cameroon has the second highest deforestation rate of Congo Basin countries, after the Democratic Republic of Congo with 0.2% net deforestation. (Dkamela, G.P. 2010).

In 2005, the Rapport National FRA,yearly deforestation rate was reported at 220 000 ha. (FAO/Forestry Department/FRA2010/035, 2010). According to ITTO (2011) the annual deforestation is higher at approx.270,000 ha per year. Tropical Ecosystem Satellite reveals that between 4823 to 6424 million ha represent degraded forest area in Cameroon, especially where the canopy was seriously degraded (Dkamela, G.P. 2010). The data indicates a negative trend in forest cover over the period due to deforestation.

Deforestation is a direct cause of biodiversity loss and a major threat for the forest ecosystem due to the associated loss of natural habitat and can also play a role in both global warming and cooling, and it leads to reductions in water regulation, and the destruction of the resource base and livelihoods for many of the world's poorest. Deforestation has a wide range of appearances ranging from selective logging to complete clear-cutting of forests.

Drivers of deforestation in the ecosystem include development activities of commercial logging, clearing of forests for large scale agro-industrial activities, mining and infrastructure. Logging represents 28% of the country's GDP with close to 80 species exploited and exported making Cameroon one of the first 5 countries in the export of tropical timber and 2nd to Gabon in the Central African Sub Region. *(interactive atlas version 3.0)* The opening of long stretches of roads in forest concessions has significantly contributed to deforestation. Large scale agro–industries constantly in the increase result in forest conversion. In 2008, oil palm occupied 136.180 ha. As stated above, mining activities pose significant threats of deforestation with 75% of the 494 mining permits for gold, diamond cobalt and iron ore issued located within the Tropical Dense Humid Forest Ecosystem and overlapping or lying in proximity to protected areas.

c) TROPICAL WOODED SAVANNAH ECOSYSTEM

The major causes of biodiversity loss identified in theTropical Wooded Savannah Ecosystem are bushfires, overgrazing and unsustainable fuel wood harvesting.

Overgrazing;Unsustainable land use practices and overgrazing by nomadic Fulani cow herders have resulted in significant deforestation in the wooded savannah of the North West Region. This has serious implications on the savannah ecosystem health, watersheds, soil fertility compromise biological cycles, and the ability of the ecosystems to recover. Herders are not being sufficiently sensitised on the negative impacts of overgrazing on the ecosystem and its consequence on their livelihoods are not felt mainly because of the practice of transhumance and nomadic cattle grazing that enable them to usually have enough pastures for the flocks.

Unsustainable fuel wood harvesting: Fuel wood is the most used energy in Cameroon *(MINEP 2008)* with 11 – 12 million cubic metre of fuel wood collected annually. *(MINFOF, MINEE 2009, EIS 2010).* The high demand for natural resources such as fuel wood for energy consumption contributes to deforestation around urban centres and along road-sides. The wooded savannah ecosystem is characterized by a high population density with more than 200 inhabitants per square kilometre in the cities and major

towns. This demographic situation leads to high demands for biological resources for agriculture and fuel wood.

Human-induced Disasters – Bushfires. Bush fires originating from pasture renewal, hunting and slash and burn farming devastate great expanses of vegetated surfaces and living organisms. In Cameroun, at least 487, 000 hectares of forests are devastated by bush fires each year. *(FAO, 2011).* The direct impact of bush fires especially in savannah highlands and semi-arid regions is the exposure of the topsoil to the vagaries of erosion forces that scrape away leading to soil infertility, sedimentation of river valleys, collapse of river banks, destruction of catchment areas and reduction of stream flow, all of which lead to biodiversity loss.

d) MONTANE ECOSYSTEM

Montane ecosystems have experienced an average loss of species population of 30% in the past 100 years *(Onana and Cheek, 2011).*Cameroon's Montane ecosystem has a high concentration of threatened species with no formal protection, thus exposing the biological resources to over-harvesting while the lower side of the mountains are exposed to over-grazing and heavy agricultural uses.

Overharvesting and specific threats to the *prunus africana*, a montane commercial species, is summarized in Box 3.4.

Box 3.5 :collecting NTFPs in a forest, Cameroon *Prunus africana* is a valuable medicinal plant, Cameroon.

Disasters of Landslides constitute significant threats to biodiversity in this ecosystem. Landslides in the Lebialem mountain forest is shown in the box below.

Plate 3.22..Landslide in Lebialem Highlands

Box 3.4: Status and threats of *Prunus africana*

Status - *Prunus africana* (Rosaceae; African Cherry, Red Stinkwood is an afromontane hardwood In Cameroon, known in various villages as « Kanda stick » in *Pidgin*, « Kwarh » in *Bakossi*; « Wotango » in *Bakweri*; « Kirah » in *Banso* ; « Alumty » in *Ngemba*, « Iluo » in *Kom* ; Dalehi in Fulfude and Eblaa in *Oku*. In 1995, ListedCITES Appendix II - Endangered Status. Bark harvest has shifted from subsistence use to large-scale commercial use for international trade wherein all bark entering the international market is currently from wild harvest.
Cameroon adopted the following measures to ensure the sustainable management of this important species

- Circular in 2007 to all Regional Delegate to ensure an effective monitoring and follow up of P.african Barks
- Suspended the grant of quotas of Prunus Africana pending the putting in place of a sustainable management system
- Adoption of 2010 National Directives for the sustainable management of Prunus Africana
- Support Project on commercialization authorisation of Prunus Africana in Mount Oku, Mount Cameroon Tchabal Mbabo and Tchabal Gandaba
- Signature of a decision creating a Prunus Africana Exploitation Unit in 2012 and the Grant of an Exploitation Licence in 2012
- Elaboration of a Community Forest Management Plan for Mount Cameroon and Mount Oku.

Economic Status: **M**ultiple-use tree species with local and international economic and medicinal value (pharmaceutical industry). To local communities this is a major secondary income source (*K.M. Stewart, 2003):*the leaves are used for traditional medicine, the branches for tool (axe, hoe) handles and ceremonial spear handles, the flowers for honey production, the root and leaves for wildlife food, the seeds for traditional medicine (rare use), the bark for traditional medicine (45 human ailments) and (11 ailments of domestic animals) and, cut as timber for roof support, bridge decks, fuel-wood, window and door frames.
Threats - Unsustainable harvesting, clearing for farming purposes, logging for timber, over-collection through felling or debarking as a result of the spread of commercial exploitation result in reduced numbers and carrying capacity for fruit-eating birds, threaten the plant's genetic distinctness and diversity of populations, and die-off of *P. Africana*, especially as this forest type covers limited areas (*Cunningham, A.B.; Mbenkum, F.T. (May 1993).* Access and resource use in certain forests such as around Mt Oku, were controlled under customary law, but traditional controls through local authorities were reported to have weakened with commercialisation of *P. africana* bark. The annual sustainable harvest level of *P. africana* has always been exceeded due to uncontrolled exploitation and illegal harvesting, inappropriate techniques and timing that have contributed to poor health of surviving trees. Bushfires devastate around 5-10 hectares of forest annually – a situation which *P. africana* seedlings and mature trees cannot tolerate. Current levels of cattle and goat grazing result in zero natural regen eration.

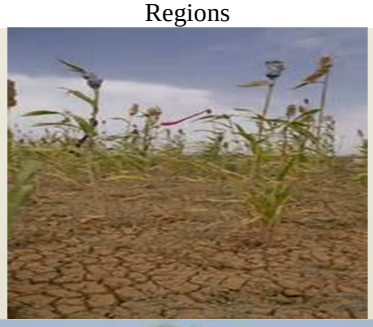
Source: UNEP/WCMC- (August 2008): Review of *Prunus africana* from Cameroon, MINFOF, 2009 National Directives for Management of of Prunus Africana

e) SEMI ARID ECOSYSTEM

Of great significance in the Semi-arid ecosystem of the northern regions are the devastating effects ofdroughts, desertification and floods which constitute a major source of pressure on the health of ecosystems with serious consequences on feeding and reproduction of species.

Drought: Between the early 1970's and the mid 1990's the African Sahel including the far north of Cameroon experienced one of the most dramatic long-term climatic changes observed in the world in the twentieth century, with an average declining annual rainfall declining of > 20%.*(Hulme et al. 2001).* This period of climatic desiccation was associated with a number of very severe droughts resulting in the deaths of hundreds of thousands of people and loss of millions of animals. *(Glantz, 1976, 1996).* The increasing frequency of drought in the past few decades has caused the migration of wildlife out of protected areas and the southward movement of pastoralists. Additionally, during severe droughts mortality of wildlife, domestic livestock and water-dependent organisms increase dramatically. The northern regions of the country faced drought and insufficient rains in 2011, which resulted in a failed harvest.

Plate 3.23-3.24: Drought effect – Northern Regions



Source: UNICEF: Save **Sahel** Nowwww.unicefusa.org

Plate 3.25: Flooding crisis in the North

Photo: Cameroon Red Cross (2012)

Floods: Disastrous floods occur almost every year in the river basins of the Benoue, Logone and Mayo Tsanaga sweeping away agricultural fields, settlements and the rich biodiversity of the area. The wet seasons of 2008, 2009 and 2012 registered abundant damages due to floods. Adjacent plains close to the Lagdo and Maga dams are very vulnerable. In 2012, 50% of agricultural products were lost due to floods and 700 ha of rice fields were flooded in the North.

In the last quarter of 2012, the North and Far North regions of Cameroon have experienced heavy rainfall and subsequent flooding, the worst in 40 years. The current food insecurity and nutrition emergency thus adds to the effects of recurrent crises, resulting in chronic and acute food shortages. The rains and floods have wiped out homes, agricultural lands, crops and livestock. Villages were evacuated leaving people displaced. 7 254 households (approximately 50 778 persons) were affected by the floods in the North region, covering a total of 137 villages (FAO 2013).

f) FRESH WATER ECOSYSTEM

Human demand on freshwater ecosystems which includes rivers, lakes, and wetlands (floodplains, seasonal swamps and marshes)has risen steeply over the past century, leading to large and growing threats

of degradation of water catchment and riparian areas, eutrophication, and disruption of ecosystem functions.

Degradation of Water Catchments: The cuts across all other ecosystems and comprises several drivers of biodiversity loss specifically the physical alterations from dam constructions and land use changes, major infrastructural development and urbanizationwhichmodify catchment areas and river courses for hydroelectricity (damming in Lagdo dam, Maga dam, Bamendjin dam, etc.), and irrigation for agriculture resulted in ecological changes negatively affecting ecosystems and biodiversity.

Disruption of ecosystem functions: Encroachment of human activities (agriculture and transhumance) in wetlands causes modification and changes in ecological functions which include maintaining and protecting natural and human systems through services such as maintenance of water quality, flow and storage, flood control and storm protection, nutrient retention and micro-climate stabilisation, etc… Farming on riparian areas of lakes and rivers endanger transitional species and large irrigation schemes. Destruction of inland marshes for agriculture also disrupts ecosystems which especially affects bird species for which wetlands are a very important sanctuary.Within river systems, upstream pollution from the industrial use of fertilizers and pesticides by agro-industrial companies lead to eutrophication. This affects the growth and diversity of aquatic species, and further exacerbates the proliferation of the highly invasive water hyacinth as observed in the Wouri Estuary.

Upstream Pollution: Upstream pollution of rivers and unsustainable freshwater fisheries exploitation such as the use of poisonous chemicals for fishing, disposal of toxic waste by industries also lead to extinction of freshwater biodiversity, etc.

3.1.1.3 Sector Specific Causes

The development options of the Growth and Employment Strategy Paper (GESP), is focused on rural development and industrialization driven by production sectors with large dependence on the ecosystems. The document recognizes the nation's natural resource potential as a natural asset to guarantee the realization of its growth vision and highlights this as an asset to underpin its intensive agriculture based on its varied ecosystems, capitalize on its energy potentials and mining resources. Forest, livestock and fisheries are related sectors of importance to its rural development goals.

The scenario reference for growth in the primary sector is 5% annually from 2010-2020. The growth rate scenario from 2000 for the sectors depicted in the table below confirms the projected escalation of activities in these key production sectors within the next decade. Mitigating the corresponding increase in pressure on the ecosystems with significant threats to biodiversity loss these activities are likely to cause and guaranteing sustainability and resilience of the ecosystems on which the resources depend, provides the basis for for special attention on sector specific drivers identified during sector consultations.

Table : 3.1 Real growth rate of the GDP by primary sector (in percentage)

Libellé	2000	2001	2002	2003	2004	2005	2006	2007
Secteur primaire	**3,99**	**3,73**	**3,67**	**3,50**	**4,37**	**2,69**	**3,02**	**5,91**
Agriculture des produits vivriers	4,65	4,57	4,98	3,49	3,44	3,19	3,25	5,64
Agriculture industrielle et d'exportation	-0,18	-1,96	2,76	2,44	10,84	1,75	-3,29	-5,07
Elevage, chasse	3,82	8,59	2,56	1,99	4,84	4,44	1,93	4,88
Sylviculture et exploitation forestière	4,54	-9,31	-4,47	9,00	5,96	-5,21	13,00	26,88
Pêche	3,47	12,71	2,86	2,28	2,15	4,60	1,67	2,02

http://www.statistics-cameroon.org/downloads/Statistiques/Compta%20Nat/Tauxdecroiss.htm

Current investment options for national growth towards a sustainable economic development over the next decade are dependent on these key sectors.

a) Agriculture

Poor results in the implementation of the 2005 Rural Development Strategy led to the option with GESP for accelerated investment in the agricultural sector. In harmony with the RDSP, GESP sets its agricultural production goal at double the current production. This calls for the intensification of agricultural extension and farmer support services to increase agricultural output through efficiency and yield increases for food security, the modernization of production systems requiring additional land.
Land expansion constitutes a major contributor to the loss of biodiversity with large agro industries, monoculture, bio-fuel. Agricultural cultivations for cash crops of cereals, plants and animal production demand fertile land. Cash crop occupies 914.609 ha nationally.

Land-use systems and cropping patterns such as the over-use of pesticides and inorganic fertilizers lead to the reduction in soil quality and fertility, thus degrading the ecosystem. Water systems are contaminated by run offs from agricultural land. Wildlife is displaced; and insects and microorganisms are decimated by pesticides. There is also a change in functions, especially in energy and nutrient cycling and storage, as well as in water infiltration and storage. Common opportunistic species tend to move into areas where natural and agricultural land uses meet and displace local or endemic plants and animals.

An emerging activity is the use of genetically modified seeds to increase production and crop resilience. In 2012, SODECOTON, the cotton plantation of the North received the first authorization to carry out a field trial introducing GMO cotton seeds. The in effective control in the use of GMOs and other living modified organisms introduced presents risks of the estruction of habitats and new ecological niches created which allow typical farmland species of birds, insects, mammals and weeds to establish themselves. Naturally occurring plant species are at risk of being replaced by a small number of introduced species.

b) Energy

The low competititvity of the nation'seconomic productivity and production capacity is largely linked to the deficiency in energy. Current hydro potential is 10 times more than actual exploitation. To boost production therefore a target for electricity production is set at attaining a capacity of 3000 MW by 2020. This is expected to drive the secondary sector growth targeted at 5.2% annually. To attain these targets the energy production goal seeks to depend on the opportunities offered by the different ecosystems *(GESP page 16 and para 144).*

The impacts of various energy sources on biodiversity include:

- Fuel-wood: unsustainable harvesting of fuel wood result in forest deforestation. Biomass is still the predominate source of fuel in the country - this is one of the most significant challenges in biodiversity conservation. Between 1990 and 2002, biomass was an essential component of Cameroon's energy consumption:77% in 1990 to 81.2% in 2002 during which year the consumption of petroleum products was 15.40% while hydroelectricity consumption was only 3.40% (*Ngnikam, Emmanuel and Tolale, Elie 2009).*
- Petroleum products: Major activities of exploration, production and transportation in the mining sector are drivers of biodiversity loss. The constant decrease in consumption of petroleum products is a result of the constant increase in their price. This situation has led to increased consumption of fuelwood.
- Hydro-electricity: Hydro-electricity projects require the construction of dams such as the Lom Pangar dam construction, the Katsina hydro project is equally underway,

- Fossil energy: the Construction of the Kribi Gas station and others has already resulted in the destruction of large forest cover. Secondly, fossil energy is a major contributor to increase in temperature and climatic variation.

While the provision of energy is important to the socioeconomic development of the country, the sustainable production and distribution of energy sources is possible. The harvesting of fuel-wood can be carried sustainably along with reforestation/afforestation programmes. Other sources of energy including petroleum products, hydro-electricity and fossil energy can contribute to economic development without unacceptable negative impacts on biodiversity – this is carried out after EIA and SEI studies and the effective implementation of the recommendations from such studies.

c) Mining Sector

As a national option, mining has been identified as an immediate asset for boosting the national economy. Modernizing the mining sector calls for mining and processing/transformation of mineral resources.

As of 2011, a total of 494 mining permits have been issued including 90 exploration permits, 4 operating permits, 150 quarry mining permits and about 250 artisanal mining authorizations. The assessment above has already highlighted the negative impact and consequences on the national conservation objective from the lack of a land use plan in all the ecosystems and the current sector based land use options.

Although mining does not deal with living resources, the impact of these activities on the ecosystems is devastating and sometime not subject of rehabilitation. Mining activities include exploration, exploitation and transformation which result in significant landscape deformations and massive destruction of vegetal cover. This involves the clearing of vast forest cover with soil and sub soil excavation. Conflicts of the mining sector with other uses such as conservation indicate that loss of biodiversity in important protected areas will be accelerated with mining activities

d) FOREST SECTOR

Cameroon is endowed with abundant natural resources, especially with a large expanse of dense tropical rainforests, predominantly in the southern part. Cameroon forest covers approximately 23 million hectares representing 47% of the total land area (MINFOF and FAO 2005). In addition, there are 15 million hectares of wooded land in the more arid central and northern parts of the country.

This sector is driven by the exploitation of timber and non-timber forests. The exploitation of timber serves in the production of wood for the construction, building, and furniture industry while non timber forest products serve for food, medicine, etc…

Unsustainable exploitation and illegal practices in the sector degrade natural habitats causing changes in landscape and loss in species.

e) LIVESTOCK SECTOR

Livestock activities involve heavy trampling around water points with destruction of vegetation cover and topsoil wash. Water points favour disease spread from wild animals to domestic animals and vice versa.

The use of chemicals in the fight against pests and diseases to improve animal health results in loss of biodiversity. Birds that feed on livestock parasites such as cattle aigrette get poisoned and die such as the case in the fight against tripanosomiasis (spread by Tse-Tse flies) in the Adamawa Region. The clearing of vast areas to improve pasture lands for the planting of new plant species such as Brachiaria (signalgrass),

modify the composition of the local environment and reduce biological diversity. This practice is being promoted in the major agro-pastoral zones of Cameroon - Adamawa, North and North-West regions.

f) FISHERIES SECTOR.

Illegal, unreported and unregulated (IUU) fishing is due to poor legislation and absence of enforcement capacity. Auto-suspension of Cameroon fisheries products export aggravates the illegality of the practice. Lots of unlawful fishing practices such as the use of chemicals and unregulated fishing nets with a resultant indiscriminate destruction of aquatic biodiversity.

g) TOURISM

Tourism is currently attracting huge infrastructural development of hotels, restaurants, resorts, and touristic sites. Biodiversity is the major touristic attraction with biodiversity hotspots of the National Parks, Forest/Wildlife Reserves as major tourist destinations. It is estimated that approx. 500,000 tourists visit Cameroon every year. *(MINTOUR, 2011)* and mostly visit the National Parks including Hunting Zones. Although the current level of tourism is not optimal, forecasts suggest that tourism will become increasingly important in biodiversity hotspot countries and will require careful planning to avoid negative impacts on biodiversity *(UNEP, 2003).*

Table 3.2 .Human development index

Year	Cameroon	Low HD	Sub-Saharan Africa	World
2012	0.495	0.466	0.475	0.694
2011	0.492	0.464	0.472	0.692
2010	0.488	0.461	0.468	0.690
2009	0.482	0.455	0.463	0.685
2008	0.474	0.448	0.456	0.683
2007	0.459	0.442	0.449	0.678
2006	0.455	0.432	0.440	0.672
2005	0.453	0.424	0.432	0.666
2000	0.429	0.385	0.405	0.639

Source- http://hdr.undp.org

Current threats from touristic activities with significant impacts on biodiversity are driven by increased infrastructural development the generation and poor management of waste and the illegal exploitation of species.

Sprouting small scale enterprises around touristic sites lead to illegal harvests for craft works from endangered fauna and flora species to attract huge income. Tourists also proceed to the illegal harvest of species.

Waste disposal from tourism activities, including waste generated by tourists, is poorly managed presenting serious threats to aquatic and terrestrial species. As examples from two major cities, most of the used water leaving Yaoundé is discharged on near-by farmlands at Nomayos and in Douala around Youpwe, with a heavy toll on flora species.

3.1.2 UNDERLYING (INDIRECT) CAUSES

Causes from the socio-cultural environment, policy, legal and institutional responses have been identified.

3.1.2.1 Causes from Socio-Cultural Environment

The sociocultural environment of the nation presents serious challenges with regard to the use and management of the natural resources with indirect negative impacts on the ecosystems and their biodiversity components. This further constitutes a major challenge to the national development efforts. The UNDP 2012 human development report highlights that between 1980 and 2012 Cameroon's HDI

rose by 1.5% annually from 0.373 to 0.495 today, which gives the country a rank of 150 out of 187 countries with comparable data. The HDI of Sub-Saharan Africa as a region increased from 0.366 in 1980 to 0.475 today. Although Cameroon is placed above the regional average the HDI trend highlights a comparatively large gap in well-being and life chances that continue as depicted in the Table below and have significant consequences on biodiversity.

Important indirect drivers of biodiversity loss are demographic pressure and increasing urbanization, poverty, gender considerations and loss of cultural values and traditional knowledge, human conflicts

Demographic Trend: Demographic pressureand the associated development in local populations directly affect resource use and drives habitat conversion in biodiversity hotspots with irreversible degradation of ecosystems. Cameroon's population has increased in the past years and was estimated at 20 million in 2012with an annual growth rate of 2.6% and birth rate of 26% *(MINEPAT/BUCREP).* Associated to this is increase in resource consumption, poverty and breakdown of traditional resource management systems with resultant increase in pressure on the ecosystem. The unsustainable use of natural resources increases with demographic growth and increased demand for biodiversity resources for production.

Migration and urbanisation with the given demographic trend exacerbate the pressure on ecosystems. Urbanisation has been identified as the most remarkable fact in the last census *(INS - 3e RGPH)* which highlights a growth rate with the number of towns >100 000 inhabitants increasing from 6 to 9 between 1987 and 2005. The major towns of Douala and Yaoundé, having over 2 million inhabitants. The rate of urbanization thus increased from 37,9% to 48,8% during the same period. Box 3.2 below is illustrative of the impacts of urban development on biodiversity.

Box 3.6: Land-use change from urban development

Four of the 16 deforestation and forest degradation 'hotspots' identified in Central Africa in 1997 by the TREES project are in the following regions of Cameroon: i) forests located in the Cross River area and Korup area along the border with Nigeria; ii) the vast region demarcated by the 4 cities of Yaoundé (the capital), Mbalmayo, Ebolowa and Kribi, which is being cleared for agriculture; iii) the Bertoua and Abong-Mbang region, especially the areas around the new roads; and iv) the roads built around Djoum. According to TREES, these 4 'hotspots' span a major part of Cameroon's residual forestlands.

Source: Dkamela, G.P. 2010.

a) Poverty

Cameroon's most recent household survey (*ECAM III),* undertaken in 2007, reveals that poverty affected an estimated 39.9 per cent of the population, compared with 40.2 per cent in 2001 and that 55 per cent of the country's poor people live in rural areas. Significant disparities in poverty trends emerged between 2001 and 2007. In urban areas, poverty showed a marked decline – of some 5 points – particularly in the cities of Douala and Yaoundé. In contrast, in rural areas, poverty had grown by 3 points, especially in the northern regions. In Cameroon, poverty continues to be fundamentally a rural phenomenon with women and children particularly hard-hit and most vulnerable. (ECAM III). 52 per cent of people in poor households are women, and half the members of poor households are under 15 years of age. The key factors identified by ECAM III as the causes of poverty are: household size, education level, socio-economic grouping and access to productive assets.
Poor communities, especially local communities depend on biodiversity resources to sustain livelihoods. The pressure on biodiversity as a result of poverty is discernible.About 40% of the population are

classified as poor and a major cause of poverty is the socio-economic situation and access to productive assets. In a vicious circle the poor depend on biological resources for their livelihoods
Where poverty is generalised, the issue of food insecurity becomes apparent with the poor turning to overharvesting of biodiversity resources and poaching, to sustain their livelihoods. The degree of utilization has varied according to social factors, but it is clear that natural ecosystems are becoming degraded in target sites where indigenous peoples (IPs) and other local communities live.

b) Lack of awareness and knowledge

Knowledge on the value of biodiversity and its invaluable link to development and livelihood remains highly insufficient. Lack of awareness by the population is evident with the lack of an educational and other targeted awareness programs. Ignorance has largely influenced the negative behavioral patterns and social practices of young persons, women, business sector and the population in general, negatively impacting the habitat and the resources on which they depend.

Major decisions and policies that are unfavourable to biodiversity are not informed by credible scientific findings that should spur appropriate response. Although research activities within the decade have generated considerable information to raise awareness on the threats to biodiversity and the consequences, the extent to which research findings has informed biodiversity policies is largely weak. The weak documentation and inaccessibility of scientific information, the poor links between science and biodiversity policies has indirect negative consequences on biodiversity

c) Inadequate Gender considerations

According to the results of the third population and housing census, Women constitute 50.6% of the Cameroonian population and are increasing in number at a rate of 10.1%, compared to 9.9% for men. Women further make up 25% of the head of households in Cameroon. *(COMIFAC 2012).*

Again, women constitute a large workforce in the agricultural sector with the rural women largely depending on biodiversity for the livelihoods of their households, Specifically, in the non-timber forest and fisheries sectors, small scale businesses are largely carried out by women with a focus on specific species for food and medicine. Globally, 80% of food in developing countries is generated by women. *(Lorena Aguilar- 2010 IUCN Report)*

Table 3.3 Sex representation of Cameroon's Population

POPULATION EN MILLIONS	2005	2010	2015	2020
FEMMES	8,6	10,1	11,6	13,4
HOMMES	8,5	9,9	11,4	13,1
TOTAL	17,1	20,0	23,0	26,5

Source : MINEPAT/BUCREP

Keys sectors where gender disparities can be seen have been identified as education, health, employment and the environment. Women nationally are largely excluded from land and natural resource ownership with a possession of only 1-7% of landed property and earn an income of 1/3 as compared to 2/3 by men.*(COMIFAC, 2012).* Biodiversity related planning and decision making process do not involve a fair representation of women resulting in the exclusion of the priorities and needs of women.

As an outcome, biodiversity planning does not adequately benefit from the knowledge possessed by women favorable to conservation and the sustainable use of resources. Biodiversity planning, projects and programs give little attention to the special needs of women for specific resources. Women in turn are

excluded from receiving biodiversity related information relevant to shape their behavior. They furthermore benefit little from biodiversity support programs and have limited access to credit to support their small businesses, receiving only 10% of credit for small holder schemes.*(COMIFAC 2012).* These today constitute disincentives for the conservation and sustainable use of biodiversity by women who make up the larger part of the population.

d) Non-valorization of traditional knowledge

The increasing importance of medicinal and aromatic plants in the pharmaceutical and cosmetope industry and its potential to contribute to development highlights the importance of the associated traditional knowledge (TK) to these genetic resources. Yet knowledge on the full value of TK and efforts to preserved and protect such knowledge remains weak. Accessing TK associated to genetic resource and the utilization of such knowledge remains unregulated and has thus been accessed and exploited over the past century without mutually agreed terms with the knowledge holders. The non-valorization of TK and exclusion of indigenous and local communities in sharing the benefits from the utilisation of their knowledge constitutes a great disincentive in biodiversity conservation iefforts.

3.1.2.2 Weaknesses in Policy and Legal Response

The national policy and legal landscape for biodiversity protection has greatly evolved within the decade, but the impact in reversing the trend in biodiversity loss has been minimal. Although significant efforts have been invested in developing policies and adopting relevant legislation, the successful implementation of these instruments is greatly hampered by several constraining factors which constitute indirect drivers of biodiversity loss.

a) Inadequate national compliance with multilateral environmental agreements

Substantial difficulties are encountered in ensuring compliance with biodiversity-related conventions ratified. This is a result of the weak capacity of key implementing actors and policy makers. Understanding the purport and advantages of conventions is relevant to expedite ratification and implementation. Delays in the ratification of the ABS Protocol and the Nagoya Kuala Lumpur Supplementary Protocol for damages from the movement of living modified organisms exemplify this position. Delays in translating the provisions of international instruments into national legislation have compromised international cooperation and the daily applications relevant in protecting biodiversity.

b) Inadequate sector integration

The challenges and opportunities for the protection of biodiversity have sectoral implications. However, the weak sector appropriation of the Framework Law on Environmental Management, National Environmental Management Plan and 2000 NBSAP greatly hampered sector mainstreaming and coherence within the orientation defined in these policies and planning instruments. A major finding from the consultation process is the weak involvement and participation in the design and adoption of the 2000 NBSAP where government institutions, civil society/private sector organizations, and local communities that implement biodiversity activities were not effectively involved in the process. The consequence was a weak appropriation/ownership of the NBSAP by major stakeholders. Reversing this trend by involving stakeholders at all stages of the revision and updating, implementation and follow up of the NBSAP is expected to engender a strong appropriation/ownership necessary to render the present document a nationally acceptable programme for the implementation of biodiversity related activities.

c) Inadequate and obsolete legislation

The absence of effective regulatory and thematic strategies weakens the legal infrastructure to ensure effectiveness realising the goals of conservation, sustainable use and fair sharing of benefits. Sharing benefits constitute a major incentive to secure participation in the conservation and sustainable use of

biological and genetic resources and the associated traditional knowledge. Royalties from natural resource exploitation have been sector driven and prevalent with forest biological resources only and the distribution fraught with inequities that contribute significantly to unsustainable exploitation of biological resources.
The exploitation of genetic resources and the associated traditional knowledge which are a major attraction for research and development, have been carried out without a national regulatory framework resulting in large scale bio-piracy and exclusion from a fair share of benefits generated by research institutions, pharmaceuticals, cosmetic industries etc. The lack of incentives favors the erosion of genetic resources. The recent development and validation of a National ABS Strategy in 2012 provides opportunities for a coordinated and coherent regulation of access to genetic resources and the preservation of associated traditional knowledge.

Uncertainties in the legal and regulatory instruments relating to the land tenure system defined by the 1974 law and its implementation texts now obsolete in providing an appropriate response have resulted in multiple conflicts thereby negatively impacting biodiversity. These include conflicts between the co-existing customary and modern law affecting issues of land rights, multiple land disputes, competing uses by agro-pasture activities etc…

d) Non coherence and Conflicts

The overlaps and duplication of laws and regulations relating to biodiversity have led to incoherence and conflicts of key legislative instruments. Conflicting provisions with the FLEM are found in the mining law, land use strategies, policies etc

Conflict in land-use is recurrent in various ecosystems and affects the sustainable management of biodiversity. *(Reed and Miranda 2007; Schwartz et al. 2012).* A land use plan has been developed for the forest and coastal ecosystem only and the absence of a land use plan for other ecosystems constitutes the basis for conflicting uses. Major conflicts are conflicts of mining zones against logging concessions, conflicts of grazing zones against agricultural land, and conflicts of farming encroachment into protected areas affecting all ecosystems of the country.

e) Weak enforcement

Weaknesses in the application and enforcement of existing laws and regulations fail to oblige compliance with the provisions of the legal instrument. Weak enforcement relates to monitoring activities of controls, inspections and sanctions in the event of infringement. Multiple governance factors including inadequacy in approach to ensure compliance, lack of collaboration between administration and key actors, and an inadequate human, material and financial resource capacity.

3.1.2.3 Weakness in Institutional Response

a) Weak co-ordination structures

The coordination of the biodiversity program within and between the institutions remains highly weak. The FLEM provides for major coordination frameworks which are non-operational or require institutional strengthening with the National Biodiversity Committee yet to be established. This has resulted to the great dependence on adhoc inter-ministerial committees for advice and guidance in each biodiversity project. Coordination of activities by the Rio Convention focal points remains weak in ensuring synergy of actions with the CBD Focal Point set as an independent structure. Designation of members to the National and Regional Commissions for sustainable Development recently set up are still awaited to make this organ fully functional.
The non-coherence in biodiversity intervention actions resulting from the weak coordination framework has significantly negative impacts in the efforts deployed to protect biodiversity

b) Participation

Although development partners have made significant efforts to coordinate interventions, these have been sector or thematic focused. Efforts within the biodiversity program are largely dispersed amongst development partners, international and national NGOs.

c) Inadequate funding of biodiversity

The inadequate funding for biodiversity activities constituted a critical handicap and requires urgent action from all key stakeholders and cooperation of partners to reverse the trend and weak prioritization of biodiversity. Annual budgetary allocations to MINEPDED have been consistently weak while environmental tax designed to fund environmental projects remain low.

3.2 CONSEQUENCES

The drivers and threats from the multiple sources identified have had significant negative consequences on the ecological environment and the human environment in all ecosystems of the country.

3.2.1 IMPACT ON ECOLOGICAL ENVIRONMENT

Direct observable pressures on ecosystems include changes in landscapes and the reduction in vegetation cover. The rate of deforestation in Cameroon as highlighted is among the highest in the Congo basin.Habitat fragmentation and degradation result in the disruption of ecosystem stability, loss of feeding and nursery grounds of certain species, mostly bird and fish, the disruption and scarcity of species as well as the migration of species (avien species) Species loss and extinction also result from changes in biological functions and species stocks with **s**pecies reaching threatened threshold such as the West African manatee, *Prunus africana*, *Baillonella toxisperma*,*spp*. (bubinga), *Baillonella toxisperma* (moabi.) and porcupine.Changes in ecosystem functions and ecosystem services offered are modified by climate change. The length of growing seasons could lead to the loss of many long duration farmer varieties as well as force large regions with marginal agriculture out of production, adversely affecting food security.Decrease in ecosystem services affect water, food, and energy.
Changes in species composition or genetic mutation result in loss of genetic resources and genes loss

3.2.2 IMPACT ON HUMAN WELLBEING

The loss of biological resources and the scarcity this creates leads to diverse conflicts and competing uses including poverty, human conflicts and human wildlife conflicts.

Poverty as a consequence of biodiversity loss results from the impact on livelihoods especially Other forms of conflicts include human conflicts over scarce resources such as farmer –grazer conflicts prevalent in the semi arid and savannah regions, mining/agro industry conflicts with logging companies, mining and protected areas, mining against local communities/indigenous people, professional hunters against local communities, human wildlife conflicts.
In rural communities that depend on biodiversity, loss of biological resources results in the reduction in opportunities for income-generating activities and small business enterprises that are nature-based while to others this may mean loss of jobs/employment. Prevalence of diseases and ill health;

Food insecurity: decreases in availability and quality of food and safety risks; decrease in freshwater supply.

Loss of Income from the decrease in GDP negatively impacts the economy at micro and macro levels. The annual loss in revenue and assets due to illegal logging onpublic lands is enormous. At level of households, the loss of income seriously affects livelihood, vulnerable communities such as fishery-dependent communities may face increased vulnerability in terms of less stable livelihoods.

CHAPTER IV

BIODIVERSITY STRATEGIC GOALS AND TARGETS

This document proposes a new policy orientation to reverse and halt the current trend in the loss of biodiversity as a way to establish a strong nature base that is indispensable for the growth of the nation's economy and a better livelihood of its people. The new orientation seeks to ensure that healthy and resilient ecosystems, sustainability in the use of their components and the benefits generated contribute to national development that is sustainable.

The new national policy is based on a long term visionary direction and a mission for its realisation conceived to respond to the specific national challenge of the times, in harnessing benefits from its biological diversity and guaranteeing its effective contribution to eradicating poverty and to the nation's growth and development. The principles that underpin all biodiversity interventions and the strategic goals defined are adapted to realising this long term vision. This national policy option has been laid out in conformity with the priorities of the national stakeholders.

Setting a timeframe for action within the new orientation and enabling an evaluation on the extent of implementation has been aligned with major international and national planning processes. The visionary direction envisages a great change in a little over two decades and allows for an end of term assessment with the national vision for growth and employment set for 2035.

While recognizing national sovereignty over the nation's rich biodiversity, the new policy design ensures compliance and coherence with its commitments under the Convention on Biological Diversity and other biodiversity-related Conventions. With regard to the realisation of the strategic goals and targets by the year 2020, Cameroon has opted for progress towards its goals, working in collaboration with the global community and in realisation of the goals of the 2011-2020 Global Strategic Plan for Biodiversity and its Aichi targets.

The 2020 national biodiversity target will enable two evaluations to be carried out on the extent of progress in the implementation within the newly instituted 3-yearly state budget programs.

4.1 VISION

Cameroon's vision for biodiversity is defined as follows:

"By 2035, a sustainable relationship with biodiversity is established in its use and sharing of benefits to meet the development needs and well-being of the people, and ecosystem balance is preserved through sector and decentralized mainstreaming with the effective participation of all stakeholders including local communities."

4.2 MISSION

Moving towards the defined vision can only be realised if attention is given to redressing the current causes and consequences of biodiversity loss through the focus of the mission, defined as follows:

"Take all necessary measures to reduce the rate of national biodiversity loss and ensure long-term sustainability of critical ecosystems in order to guarantee by 2020 the continuous contribution of biodiversity and other ecosystem services to wealth creation including through mainstreaming, capacity

building and funding biodiversity that is driven by a strong partnership with the involvement of indigenous and local communities and a focus on gender as a guarantee for future generations."

4.3 GENERAL PRINCIPLES

To attain the defined vision and mission, and inspired by the provisions of the Convention on Biological Diversity, the Framework Law on Environmental Management, the National Environmental Management Plan and the Growth and Employment Strategy Paper, interventions in biodiversity-related activities will be guided by the following principles:

Principle 1 The country's biodiversity resources constitute the nation's natural heritage with intrinsic values and consequently should be used sustainably to the benefit of its people and improve their livelihoods.

Principle 2 All stakeholders have the responsibility to contribute to the conservation of biodiversity and to ensure the sustainable use of its components.

Principle 3 At all levels of biodiversity decision making processes, stakeholders including local communities and vulnerable groups are entitled to participate and for this purpose should have access to information on biodiversity.

Principle 4 An ecosystem approach based on adaptive management principles is central to achieving biodiversity conservation and the sustainable use of its components.

Principle 5 The payment for biodiversity and ecosystem services should be promoted and instituted as a corporate and development responsibility.

Principle 6 Mainstreaming biodiversity and ecosystem considerations into all sector and national planning processes is central to guaranteeing development that is ecologically and economically sustainable.

Principle 7 Biodiversity conservation, sustainable use and benefit sharing should be a major consideration in Environmental and Social Impact Assessment which are planning tools for major development initiatives.

Principle 8 The traditional knowledge and practices of indigenous and local communities should be respected, preserved, maintained, and used with the prior informed consent of the holders of such knowledge and practice.

Principle 9 Bilateral, multilateral as well as technical, financial and scientific cooperation related to biodiversity should be promoted at the national, sub-regional and international levels.

Principle 10 There should be consistency, harmonisation and coordination of all biodiversity-related policies within and across sectors.

4.4 STRATEGIC GOALS

In conformity with priorities of the national consultation, four strategic goals (areas for intervention) have been prioritized to address the causes of biodiversity loss, improve the current state of ecosystems and species, redress the consequences of biodiversity and strengthen the response measures with a focus on sector and decentralised approaches.

STRATEGIC GOAL A

ADDRESSING THE CAUSES OF BIODIVERSITY DEGRADATION/LOSS BY REDUCING THE DIRECT AND INDIRECT PRESSURES ON BIODIVERSITY.

Rationale for Strategic Goal A – This goal seeks to provide a response to the underlying direct and indirect causes of biodiversity loss relating to the lack of awareness and knowledge on the values and potentials of biodiversity, the weak import of science to inform decision making and production patterns, the demographic trend, urbanisation and poverty and the pressures from their increasing demands for

biodiversity with unsustainable consumption and production patterns, and weaknesses in the policy and legal sphere. These drivers have significantly contributed to the regressive trend of habitant erosion and changes with the depletion and extinction of species experienced in the last decade.

Reversing this trend calls for a change of behaviour by all actors at local, decentralised and national levels in adoption of decision making and policy options, and practices that are favourable to reducing biodiversity loss. Although behavioural change is a long term outcome, improving knowledge on the causes and consequences of biodiversity loss and amongst targeted stakeholders and the population in general is of fundamental importance to ensure that biodiversity is used in a manner that is sustainable. This will enable a favourable response especially in carrying out activities with non-polluting effects and ecologically sustainable exploitation practices. It is further important to adopt favourable attitudes in filling the identified gaps in the current framework of laws and thematic strategies and strengthening weak law enforcement that indirectly drive biodiversity loss.

STRATEGIC GOAL B

MAINTAINING AND IMPROVING THE STATUS OF BIODIVERSITY BY SAFEGUARDING ECOSYSTEMS, HABITATS, SPECIES AND GENETIC DIVERSITY.

Rationale for Strategic Goal B: The objective of this goal is to respond to the major consequences of human and natural pressures on the ecological environment relating to the changes in landscapes and fragmentation of habitat that reduce the resilience of various ecosystems and disrupt ecosystem stability and functions. As a result critical endemic species are under serious threats, endangered or invaded while loss and extinction of species and loss of ecosystem system services prevail.

To address these consequences, there is a focused attention on preventive and restoration efforts to improve the status of ecosystems, species and genes. This involves preventive approaches to significantly reduce ecosystem degradation, protect species and genetic resources that are under threat, the proper management of protected areas and the inclusion of community systems in the management of biodiversity. Restoration approaches will be targeted at rehabilitating degraded ecosystems and restoring depleted species.

STRATEGIC GOAL C

PROMOTING THE SUSTAINABLE UTILIZATION OF BIODIVERSITY FOR WEALTH CREATION AND CONTRIBUTING TO POVERTY ALLEVIATION.

Rationale for Strategic Goal C - The highly negative impact of degraded and dysfunctional ecosystems and loss of species on the social and economic wellbeing of the people has established a strong link between the nation's rich biodiversity and its quest for growth and development.

This goal seeks to provide response to the human consequences of loss of biodiversity which constitute factors that compromise national development and include poverty, diseases, diverse conflicts, food insecurity, loss of household and national income and unemployment. Realising this goal demands the generation of wealth from biodiversity to contribute to poverty alleviation and act as an incentive for biodiversity conservation and its sustainable use. This is aligned with the nation's current development trend and option which is driven by its natural capital. Ensuring that socio-economic benefits from biodiversity and ecosystem services underpin the fight against poverty alleviation is a national priority.

Realising this goal is based on the importance that is given to biodiversity and ecosystem services and their economic valuation. The opportunity of a new national approach for budgeting which recognizes biodiversity as a major programs calls for the carrying out of a valuation of the economic importance of biodiversity to support the Biodiversity Budgeting and accounting system which will effectively track the contribution of biodiversity to development and justify the need for investments in biodiversity. Priority interventions also include the institution of an effective national mechanism for the payment of ecosystem services including intangible services such as carbon sequestration, mitigation of climate change, cultural value of forest and associated landscapes and watershed Furthermore, the effective implementation of the newly defined strategy for sharing benefits generated from the utilisation of biological and genetic resources as well as associated traditional knowledge provides guarantees for improving the livelihoods of local people as knowledge holders and contributing to the cost of conservation of biodiversity.

STRATEGIC GOAL D

PROMOTING THE INTEGRATION OF BIODIVERSITY IN SECTOR AND LOCAL LEVEL PLANNING AND DEVELOPMENT.

Rationale for Strategic Goal D – Although significant efforts have been made in developing the legal and institutional framework for the conservation and use of biodiversity and security benefits for its use, weaknesses in these measures have failed to provide the framework for halting the loss of biodiversity as expected.

Addressing the wanton nature of regulatory frameworks is relevant to make key provisions and mechanisms operational. The coordination framework needs to be revamped and supported for coherence across the multiple sectors and stakeholders and to ensure implementation and follow up. Effective mainstreaming as a key strategy for sector intervention in biodiversity protection is a crucial phase for the realisation of the targets that cut across sectors and the ecosystems. Strengthening the human, financial and technical capacities is central to effective realisation of the national vision and defined targets for biodiversity and the implementation of its priority actions.

Gender is an existing and cross cutting concern in the fight against poverty and the successful realization of the development goals within the GESP. Addressing the differentiated needs and concerns for men and women relating to biodiversity with a focus on the most vulnerable group and strengthening their capacities is critical to achieving these goals. *(CBD 2008).*A strong partnership with biodiversity development partners and all stakeholders remains a priority.

4.5 BIODIVERSITY TARGETS

The four defined strategic goals for intervention provide a new orientation with clear guidance for the development of national targets and an action plan with priorities for biodiversity protection. This constitutes a major outcome of the wide consultations with key sectors, stakeholders at regional levels and experiences from field assessments which enabled the identification of agreed targets against which progress can be assessed.

Considering that challenges and opportunities for biodiversity protection are not uniform across ecosystems and sectors, the defined targets have also highlighted variations and specificities of its diverse ecosystems . It is within this framework that twenty (20) National Level Targets and ten (10) Ecosystem-specific Targets have been defined to ensure the effective realisation of the strategic goals. A clear orientation has been provided for sector mainstreaming.

4.5.1 GENERAL TARGETS

STRATEGIC GOAL A: Address the underlying causes of biodiversity degradation and loss by reducing the direct and indirect pressures on biodiversity.

Five targets have been identified for the realisation of this defined strategic goal.

<u>TARGET 1</u>: ***By 2020 at least 80% of the population are aware of the importance of biodiversity with an increased knowledge on the link and impact of human activities on the major ecosystems.*** Redressing

BOX 4.1 BIODIVERSITY TARGETS

TARGET 1:	By 2020 at least 80% of the population are aware of the importance of biodiversity with an increased knowledge on the link and impact of human activities on the major ecosystems.
TARGET 2:	By 2020 significant increase in the contribution of scientifically-based information into biodiversity decision making processes and management interventions.
TARGET 3:	By 2020, all forms of pollution from water and land-based activities are brought to levels that are non-detrimental to ecosystem functions.
TARGET 4:	By 2020 an ecologically sustainable system of production and consumption is established based on sustainable practices with appropriate investments.
TARGET 5:	By 2020 Biodiversity-related laws and regulations are strengthened and made coherent in order to avoid conflicting uses and combat illegal practices
TARGET 6:	By 2020 the rate of degradation and fragmentation of ecosystems and the loss in habitats is significantly reduced at least by half.
TARGET 7	By 2020 endemic and threatened species of flora and fauna should be sustainably managed
TARGET 8:	By 2020 re-establish and/or recover local extinct species in-situ and ex-situ and maintain a level of conservation that ensures long term sustainability
TARGET 9:	By 2020 degraded ecosystems/habitats should be rehabilitated to re-establish and/or recover lost species and maintained at a level of conservation that ensures long-term sustainability.
TARGET 10:	By 2020, the negative impacts of Climate Change and Climate Variation on ecosystems and human well-being are significantly reduced through ecosystem-based climate change adaptation measures.
TARGET 11	By 2020, at least 30% of the national territory, taking into consideration "ecosystem representativeness" is under effectively and equitably managed protected areas.
TARGET 12:	By 2020, the genetic diversity of cultivated plants, domesticated animals, and their threatened wild relatives, including culturally valuable species, should be maintained and valorised
TARGET 13:	By 2020 community-based biodiversity conservation and ecosystem management approaches should be promoted.
TARGET 14:	By 2020 the development and implementation of a comprehensive program for the valuation of biodiversity should have been realised and payments for ecosystem services and goods imputed into the national budget for use in promoting sustainable biological and genetic resources programmes.
Target 15:	By 2020, the establishment and implementation of mechanisms for the payments for ecosystem services, including carbon stocks, should generate increased revenue.
TARGET 16:	By 2020, the sharing of benefits from payments for the sustainable utilisation of biodiversity, genetic resources and associated traditional knowledge should increase incomes of local communities.
TARGET 17:	By 2020, biodiversity-related coordination mechanisms should be fully functional and strengthened
TARGET 18:	By 2020, key production sectors and decentralised local authorities should have developed sector or region-specific biodiversity targets, linked to the national targets.
TARGET 19:	By 2020, the capacity of key actors should be built and gender mainstreaming carried out for the effective implementation of the biodiversity targets
TARGET 20:	By 2018, partnership support and funding of biodiversity programs should have increased

the low level of information and knowledge through sensitization and public awareness is a critical approach to improve knowledge on the value, the causes and consequences of biodiversity loss. Campaigns to promote behaviour change should target a wide range of actors in educational establishments, media, literature, decentralised authorities, national and sector level decision makers, NGOs and indigenous and local communities.

Private sector actors driven by short-term profit motives do not yet understand the linkage between investment in maintaining ecosystem health and sustainability of the ecosystem services and the natural resource base on which their profit is dependent. Targeted awareness programs on the long term benefits of corporate responsibility towards biodiversity conservation and sustainable use is necessary to secure private sector involvement.

<u>TARGET 2</u>: By 2020 significant increase in the contribution of scientifically-based information into biodiversity decision making processes and management interventions.

A priority in increasing the knowledge base on biodiversity is to strengthen the relationship between science and decision making in policy and management of biodiversity. More attention will be given to generating information through applied research targeted at illuminating the values of biodiversity including their economic and ecosystem values, the extent to which biodiversity can contribute to development, research on under-utilised species which can be valorised etc… will significantly inform major development and intervention options. To strengthen the documentation system and infrastructure for the information generated calls for the establishment of a functional data base including a fully operational Biodiversity Clearing House. Although a descriptive list exists for plants the state of threatened species and discoveries of new species calls for a regular updating on a 5 yearly basis. The establishment of a National Red Data Book to include animal species will equally provide a useful base for decision making and monitoring of animal biodiversity.

To ensure that the knowledge generated is applied research information on biodiversity needs to be accessible for informed and scientific based decision making. The option of a science-policy platform as a mechanism to share knowledge will strengthen dialogue and communication and thus facilitate the coordination and packaging of research information on biodiversity and ecosystem services for biodiversity policy planners and managers. This new approach will call for a review of research strategies and policies of biodiversity related research institutions and organisations.

<u>TARGET 3</u>: By 2020, all forms of pollution from water and land-based activities are brought to levels that are non-detrimental to ecosystem functions.

Preventing and mitigating the impacts of pollution and the serious threats these present for air, land and aquatic biodiversity, is a great concern. In view of the current development prospects with an increase in land and marine based activities by large scale agro-industries, forest, mining, port, infrastructure, fishing, livestock, tourism and other sector activities, there is a need for urgent action to prevent and mitigate the impact of the polluting substances, solid and liquid waste that will increasingly be generated across all ecosystems and within specific sectors

A major preventive approach is to ensure the conduct of EIAs for all development projects and ensuring effective consideration of biodiversity indicators in EIAs. Also, periodic Strategic Environmenntal (Impact) Assessment (SEA) of policies and programmes would be useful for biodiversity conservation initiatives. Monitoring the implementation of environment management plans of corporate entities is necessary to ensure compliance. Controls and inspections need to be strengthened. Developing general waste management programs and promoting the development of specific waste management programs that prevent the contamination of both surface and underground freshwater resources is a priority in reducing the current levels of pollution. The quality (pH, temperature, electrical conductivity, and major ions) of freshwater bodies need to be monitored periodically.

<u>TARGET 4</u>: By 2020 an ecologically sustainable system of production and consumption isestablished based on sustainable practices with appropriate investments.

As a priority response to the current unsustainable mode of consumption and production exacerbated by an growing population, there is need to promote a sustainable use of the ecosystem and species of importance in a manner that will reduce the pressure on biodiversity and maintain the increase of activities within safe ecological limits.

Focus will be given to promoting the sustainable use of plant and animal resources in the production system of key development sectors to increase yield and production; promoting the alternative consumption of new species and the diversity of crops and varieties to reduce pressures on species under threat; supporting small and medium size enterprises with less pressure on biodiversity; promoting the sustainable use of alternative energy and promoting the sustainable management of production landscapes in relation to water consumption, agro chemical use, habitat conversion, monoculture.

<u>TARGET 5</u>: By 2020 Biodiversity-related laws and regulations are strengthened and made coherent in order to avoid conflicting uses and combat illegal practices

Responding to the identified challenge of an inadequate response of the current normative framework constitutes a priority. Major interventions will include ensuring compliance with commitments to multilateral agreements relevant for biodiversity through the building of understanding within key decision making levels. This understanding will be relevant in expediting ratification processes for key instruments within the Convention of Biological Diversity such as the Nagoya Protocol on ABS and the Kuala Lumpur-Nagoya Supplementary Protocol for Liability and Redress in the event of damage from the movement of living modified organisms. Developing relevant regulatory instruments and guidelines for relevant pieces of legislation including ABS is required.

The evolving trend and challenges for biodiversity call for reforms in key sectors of relevance to institute forest and land tenure systems which are no longer adapted. This further calls for links with national Target 18 in the mainstreaming of biodiversity priorities within the on-going revision of the forest law and the land law.

The option to ensure coherence in sector instruments as well as well as coherence with the FLEM and the NBSAP, calls for a revision of sector policies and legal instruments. A national land use plan in all ecosystems with a coordinated management is a key management approach to avoid the prevalent multiple use conflicts. Ensuring law enforcement is relevant for the effective implementation of adopted laws and combatting illegal practices and exploitation of wild species.

STRATEGIC GOAL B: Maintain and Improve the Status of Biodiversity by Safeguarding Ecosystems, Habitats, and Species and Genetic Diversity.

Seven (7) targets have been prioritized to address the consequences of ecosystem degradation and species loss.

<u>TARGET 6</u>: By 2020 the rate of degradation and fragmentation of ecosystems and the loss in habitats is significantly reduced at least by half.

The priority here is critical habitats that are under threat serious threats of degradation and require protection such as forests, mangroves, wetlands etc. Reducing the rate of degradation calls for the development of management plans for all hotspots or critical habitats that are protected, the carrying out

inventories and conducting assessments to set baselines against which monitoring can be carried out to determine the state of biodiversity and highlight trends.
Threats of degradation in non-protected areas equally need to be addressed. This includes areas of rich biodiversity such as sacred forests, cattle ranches, etc.

TARGET 7 By 2020 ***endemic and threatened species of flora and fauna should be sustainably managed***

Species diversity underpins the efficiency of any ecosystem to be resilient to changes and pressures. The priority in preventing the threats and pressures on endangered and rare species through sustainable management approaches calls for Species specific management plans for flora and wildlife to be developed in the first place. Strategies for threatened species will be developed. A focus on biological invaders and living modified organisms that are alien or introduced including by ballast waters, calls for a comprehensive program to be developed for their control and management. Decentralised strategies will also be developed to ensure that ecosystem specificities are taken into consideration

TARGET 8: By 2020 re-establish and/or recover local extinct species in-situ and ex-situ and maintain a level of conservation that ensures long term sustainability

Developing and implementing a species conservation and recovery program will provide the framework for targeted response. Again the creation or expansion of green corridors will ensure connectivity of ecosystems which are relevant for species recovery and conservation.

TARGET 9: By 2020 degraded ecosystems/habitats should be rehabilitated to re-establish and/or recover lost species and maintained at a level of conservation that ensures long-term sustainability.

Over the years, ecosystems and the habitats they habour - including Protected Areas (PAs) have witnessed significant degradation.

The priority for reversing the current state of degraded habitat is the development and implementation of habitat rehabilitation programs. This will be carried out in synergy with Target 8. An inventory of degraded ecosystems and fragile habitats will enable the identification of priority areas for intervention and the development of ecosystem specific rehabilitation programs. This approach will facilitate the involvement of decentralised authorities and local communities in the management of these programes

TARGET 10: By 2020, the negative impacts of Climate Change and Climate Variation on ecosystems and human well-being are significantly reduced through ecosystem-based climate change adaptation measures.

Climate change and climate variation are negatively impacting on ecosystems and consequently on the wellbeing of the populations that depend on ecosystem resources for their livelihoods. Therefore actions need to be put in place that reduce the negative impacts of climate change and climate variation and enable affected communities to effectively adapt to climate change and climate variation through sustainable agricultural and livestock practices, integrated freshwater catchment management, and afforestation/reforestation programmes. The future REDD+ mechanism envisaged in Target 15 is also a major strategy to reduce GHG emissions as they address the direct and indirect causes of deforestation and degradation.

TARGET 11: By 2020, at least 30% of the national territory, taking into consideration "ecosystem representativeness" is under effectively and equitably managed protected areas.

Current Protected Areas (National Parks, Wildlife/Forest Reserves, Sanctuaries, Hunting zones, including Sacred Forests) cover 30% of the land cover and thus beyond global targets. However, the effective management of the PA's is hampered by funding and personnel constraints and the non-involvement of indigenous and local communities. Furthermore, the National Protected Areas System is not representative of the ecosystem diversity.

As a response, new protected areas will be created in fragile and biodiversity hotspots where this will ensure a national representation of the six ecosystems. Priorities will aim to improve and sustain the status of threatened species through in-situ (gene/seed banks, wildlife sanctuaries, etc.) in fragile ecosystems of the marine and semi-arid ecosystems. A programme for the sustainable management of protected areas, restoration of degraded PAs and valorisation of PA biodiversity will be established and implemented. An emerging approach to support management costs of protected areas as well as generate wealth for riparian communities to PAs will be to develop and implement an Access and Benefit Sharing scheme for national protected areas. This will ensure that bioprospection, tourism and other uses of protected areas effectively contribute to conservation and livelihood

TARGET 12: By 2020, the genetic diversity of cultivated plants, domesticated animals, and their threatened wild relatives, including culturally valuable species, should be maintained and valorised

This target seeks to ensure increased attention on genetic biodiversity, its values and protection.

Priority interventions call for inventories of genetic species will be carried to identify threatened species requiring protection and marketable species. With a focus on plant genetic diversity, management programmes for identified species will be developed and implemented. Hotspots for genetic agro-biodiversity will be identified to protect their erosion. Genetic species with potentials for commercialisation will be valorised and cultivated species promoted.

TARGET 13: By 2020 community-based biodiversity conservation and ecosystem management approaches should be promoted.

The erosion of cultural values favourable to the conservation and sustainable use of biological resources is a consequence of the weak involvement in conservation programmes of indigenous and local communities who are knowledge holders of the nation's rich and diverse culture. Efforts in ensuring community involvement in natural resource management have been highly sector focused.

Instituting Community-based biodiversity conservation and management approaches within specific ecosystems provides an opportunity to valorize the rich diversity of the nations cultural systems and to ensure the effective integration of customary norms and traditional knowledge into biodiversity management approaches. This will further guarantee the implementation of the principlesadopted by this strategy.
This calls for the establishment of community-based conservation programs in all ecosystems, the integration of biodiversity conservation activities in existing community forests management plans that have been developed with the participation of riparian communitie and promoting the rehabilitation and classification of more sacred forests.

STRATEGIC GOAL C: Promote the sustainable utilization of biodiversity for wealth creation and contribution to poverty alleviation.

Three targets have been identified as priorities to attain this strategic goal.

<u>TARGET 14</u>: By 2020 the development and implementation of a comprehensive program for the valuation of biodiversity should have been realised and payments for ecosystem services and goods imputed into the national budget for use in promoting sustainable biological and genetic resources programmes.

The objective of this target is to generate information and track the contribution of biodiversity into national budget frameworks. Biodiversity economic valuation and accounting necessary to track biodiversity contributions is an emerging approach to be instituted and requiring the development of capacities of economic planners. The focus here is on all types of biological and genetic resources currently being utilized or with potentials for commercialization.

Realising this objective calls for the Development and implementation of a comprehensive program for the valuation of biodiversity to generate information on its economic potentials, Building of Capacity and Development of tools for biodiversity accounting, Promotion of the commercialization of a diversity of biological and genetic resources with high economic potentials,

<u>Target 15</u>:By 2020, the establishment and implementation of mechanismsfor the payments for ecosystem services, including carbon stocks, should generate increased revenue.

This target seeks to ensure that national level compensation mechanisms benefit from efforts made within the conservation framework. The recent adoption of a National REDD RPP provides the orientation for a national framework to ensure that benefits are generated from ecosystem services.

The response calls for mechanisms for the payment of carbon stocks and REDD+ to be put in place with pilots initiatives in the ecosystems generating income for its wide beneficiaries, , Promotion and encouragement of additional voluntary payment mechanisms for utilization of biological and genetic resources by the business sector,

<u>TARGET 16</u>: By 2020, the sharing of benefits from payments for the sustainable utilisation of biodiversity, genetic resources and associated traditional knowledge should increase incomes of local communities.

The objective of this target is to ensure that compensation schemes are defined for the utilization of all biological and genetic resources in a manner relevant for the effective valorization of traditional knowledge and their application effectively contribute to improving the livelihoods of local communities. Compensation schemes for the utilization of biological resources should expand beyond forests and the new strategy for ABS should be made operational with appropriate regulations and guidelines

Interventions in this priority area calls for the Development and implementation of mechanisms for payments and sharing of benefits generated from the commercialization of resources such as non-timber forests, animal resources, fisheries, genetic resources etc…. The development and implementation of ABS frameworks for payments for commercial and non-commercial research in protected areas will cross cut with the target on generating wealth, protection and valorization of traditional knowledge associated with biological and genetic resources, and the building of capacities of indigenous and local communities and networks for participation in biodiversity related compensation schemes.

STRATEGIC GOAL D: Mainstream biodiversity in sector and local level strategies and strengthen coordination and capacity for implementation.

Four targets have been identified as priorities to attain this strategic goal.

***TARGET 17*: By 2020, biodiversity-related coordination mechanisms should be fully functional and strengthened**

The new orientation in carrying out the defined mission for biodiversity recognises the critical importance of multi sector involvement and the role of decentralised, central and international institutions/organisations. This target is focused on ensuring an effective coordination of intervention actions at all levels by the multiple organisations

This calls for building on existing and established coordination structures with a focus on the Office of the National Focal Point for the CBD, the National Biodiversity Inter-ministerial Committee, the Environment Coordination Committee and funding organs set up by the FLEM.

Ensuring an effective synergy and national collaboration in the application of biodiversity related Conventions calls for the setting up of a dialogue platform that will bring together National Focal Points for the CBD, Ramsar, CITES and CMS.

***TARGET 18*: By 2020, key production sectors and decentralised local authorities should have developed sector or region-specific biodiversity targets, linked to the national targets.**

This target seeks to ensure effective mainstreaming of the priorities of this document into key sector strategies and development programmes of decentralised local units.

Intervention calls for coherence with the national biodiversity targets and/or reviewed sector strategies to integrate biodiversity concerns with adequate yearly budgetary provisions for the implementation of related programmes/projects/activities. Key sectors made up of: i) Forests and Wildlife; ii) Agriculture; iii) Livestock and fisheries; iv) Tourism; v) Mining and Extractive Industries; etc., will peruse the General and Ecosystem Targets and taking into consideration the sector peculiarities, integrate biodiversity into the sectors activities.

***TARGET 19*: By 2020, the capacity of key actors should be built and gender mainstreaming carried out for the effective implementation of the biodiversity targets**

This target addresses the concerns for cross cutting issues of training, capacity building and gender.

It seeks to ensure that training and capacity building of key stakeholders is integrated in the biodiversity programs and projects as a guarantee for a more dynamic and effective role in the realisation of the defined Strategic Goals and Targets by the year 2020. Target groups should include actors from Coordination organs set up at the level of the Focal Institution, key production sectors, decentralized regional and local authorities and private sector coordination structures, NGO networks, leaders of indigenous and local community organizations.

For an integral dimension in biodiversity planning, implementation and monitoring, it is urgent to provide for the generation of information and development of tools for outreach and mainstreaming on gender. This calls for the collection and generation of information on how biodiversity planning, implementation and monitoring affect gender differentiated needs of men and women and impact livelihoods, the

development and application of tools for outreach and mainstreaming of gender, the effective mainstreaming of gender into major national and sector policy instruments, laws and programs related to biodiversity and using opportunities of land and forest reforms, REDD+ strategy development and regulatory instruments including ABS.

<u>TARGET 20</u>: By 2018, partnership support and funding of biodiversity programs should have increased

A strong partnership with development partners and all stakeholders is central the implementation of priority programs and projects identified. Innovative approaches to mobilise support and investment from sector ministries will constitute a critical part of the priority interventions.

This calls for urgent intervention by 2015 at the evaluation of the first national budget program through actions in developing a biodiversity resource mobilisation plan, mobilising partner support for the implementation of the revised NBSAP, Mobilising innovative sector and local planning budget and investments in biodiversity programs and budgets, establishing a baseline on multilateral, bilateral and national budgets in support of biodiversity programs and monitoring investment flow in biodiversity as required by Decision X/3 of COP-CBD on resource mobilisation

4.5.2 ECOSYSTEM-SPECIFIC TARGETS

This section establishes the link between the general strategic objectives/targets and the ecosystem based objectives and targets. Effective mainstreaming also calls for specific targets to address the specific challenges for each ecosystem in compliance with the general orientation of the NBSAP document. A total of ten (10) ecosystem-targets have been defined for the six identified ecosystem and are referred to as E-Targets.

a) MARINE/COASTAL ECOSYSTEM

The three targets specific to this ecosystem seek to provide responses to the major drivers of ecosystem degradation and fragmentation including pollution, mangrove destruction and fragmentation, pollution and coastal erosion

E-Target 1: By 2020, all sources of coastal and marine pollution should be effectively controlled to reduce pollution and mitigate its impact on the ecosystem.

This target recognizes the existence on-going programs to reduce pollution in the coastal and marine environment and the inadequacies to provide the expected response. The target thus seeks to strengthen control of pollution arising from sources specific to the coastal and marine zone and to mitigate the impact of pollution on the ecosystem
Priorities will include the establishment of a collaborative mechanism to strengthen control of marine pollution, strengthening of control and inspections of coastal and marine sector activities with polluting effects, Intensify existing programmes for control of marine and coastal pollution

E-Target 2: By 2020, mangrove forest and associated coastal forest degradation and loss should have been significantly reduced

Current responses are insufficient to address the specific threats to the massive degradation and fragmentation of mangrove habitats. This target seeks to strengthen on-going approaches and programs.

BOX 4.2 ECOSYSTEM SPECIFIC TARGETS

E-Target 1:	By 2020, all sources of coastal and marine pollution should be effectively controlled to reduce pollution and mitigate its impact on the ecosystem.
E-Target 2:	By 2020, mangrove forest and associated coastal forest degradation and loss should have been significantly reduced
E-Target 3:	By 2020, Coastal Erosion should be greatly reduced and eroded coastal beaches rehabilitated.
E-Target 4:	Develop and/or intensify integrated action frameworks on all activities (mining, industrial logging, smallholder agriculture, and illegal logging) that impact on forest biodiversity conservation, Protected Areas management in a manner that enhances local governance.
E-Target 5:	By 2020 bushfire incidence should be reduced by at least 30%.
E-Target 6:	By 2020 the use of alternative energy should have increased and significantly reduced pressure on fuel wood.
E-Target 7:	By 2020, at least 50% of grazer populations have developed the capacity to reduce overgrazing
E-Target 8:	By 2020 Increase by 20% and strengthen Community-Based Biodiversity Conservation and Management initiatives for endangered montane species.
E-Target 9:	By 2020 at least 25% of sites degraded by droughts or floods are rehabilitatedwithin the semi-arid ecosystem.
E-Target 10:	By 2020 wetlands of great significance should be under management plans and at least 10% of degraded fresh water catchment areas and riparian zones restored and protected.

Intervention priorities call for the intensification of on-going programs for mangrove restoration and its sustainable us, and the protection of spawning rounds.

Realising the goal of this target will call for collaboration with on-going programs and initiatives in the marine and coastal zone.

E-Target 3: ***By 2020, Coastal Erosion should be greatly reduced and eroded coastal beaches rehabilitated.***

Responding to the threats from coastal erosion due to the impacts of climate change, unsustainable clearing of coastal vegetation, inundations, etc., with devastating impacts on the marine and coastal ecosystem, requires the strengthening of current programs.

This calls for the carrying of studies to identify and understand the underlying causes and further promoting the rehabilitation of eroded coastal beaches by supporting the use of cost effective local technologies.

b) TROPICAL DENSE HUMID FOREST ECOSYSTEM

E-Target 4: Develop and/or intensify integrated action frameworks on all activities (mining, industrial logging, smallholder agriculture, and illegal logging) that impact on forest biodiversity conservation, Protected Areas management in a manner that enhances local governance.

Deforestation is identified as a major threat for loss of forest biodiversity driven by conflicts from land use allocation and resource use conflicts. In providing a response to this threat, the target is focused on strengthening the coordination of land use allocation and promoting integrated approaches to avoid conflicts. Establishing and ensuring effective implementation of sustainable forest management systems in the informal forest sector is expected to response to the increasing illegal logging for local markets

c) TROPICAL WOODED SAVANNAH ECOSYSTEM

Major drivers for biodiversity loss identified as specific to this ecosystem include bush fires, unsustainable fuel wood harvest and overgrazing.

E-Target 5: ***By 2020 bushfire incidence should be reduced by at least 30%.***

Addressing the threat of bush fires which emanate from human action, calls for a special attention, to ensure a change in behaviour and agricultural practices. It is a priority to control and minimize the impacts of bush fire in this ecosystem

E-Target 6: By 2020 the use of alternative energy should have increased and significantly reduced pressure on fuel wood.

This target seeks to provide a response to the increase in demographic trend with corresponding demands for fuel wood especially in urban cities. Intervention actions should focus on promoting the use of alternative energy adapted to tropical wooded savannah ecosystem and promoting the development of local technologies on alternative energy. This e-targets cuts across the semi arid ecosystems.

E-Target 7: By 2020, at least 50% of grazer populations have developed the capacity to reduce overgrazing

This target is aimed at addressing the lack of knowledge of the undesirable impacts of overgrazing. As a priority, capacity building programmes for herders in local communities and Training on forage production will contribute very significantly to reduce biodiversity loss from over-grazing.

The realisation of this target will also be considered a priority in the Semi-arid and Montane Ecosystems.

d) MONTANE ECOSYSTEM

E-Target 8: By 2020 Increase by 20% and strengthen Community-Based Biodiversity Conservation and Management initiatives for endangered montane species.

This target in providing a response to the threats of unsustainable exploitation of endangered species and the recurrent landslides in this ecosystem, has opted for a community based conservation approach. The involvement of local communities that are the on-the-spot stakeholders provides guarantee for ensuring sustainable management and providing early responses to manage landslide disasters.

e) SEMI-ARID ZONE ECOSYSTEM

E-Target 9: *By 2020 at least 25% of sites degraded by droughts or floods are rehabilitated within the semi-arid ecosystem.*

To provide a response to the threats from climate change and climate variation with a focus on droughts and floods that are specific to this ecosystem calls for an increase in the mitigation approach of rehabilitation. Priority intervention here is to rehabilitate degraded flood and drought zones with high biodiversity.

This priority is not exclusive of the rehabilitation projects within the general target for climate change.

f) FRESHWATER ECOSYSTEM

E-Target 10: By 2020 wetlands of great significance should be under management plans and at least 10% of degraded fresh water catchment areas and riparian zones restored and protected.

To respond to the growing threats of degradation of water catchment and riparian areas, eutrophication, and disruption of ecosystem functions identified as specific to freshwater ecosystems, defining policy options and instituting management priorities for this fragile ecosystem are key priorities.

This calls for the putting in place of: i) an effective management system with programs to be implemented in a manner consistent with the Management Principles of the Convention on Wetlands; ii) defining and implementing aWater Resource Management policy and the general standards and guidelines for a National Water Quality Management; iii) an Integrated Water Resource Management plan and, iv) putting in place standards and guidelines for a National Water Quality Management system.

4.5.3 SECTOR-SPECIFIC TARGETS

Key sectors made up of: i) Forests and Wildlife; ii) Agriculture; iii) Livestock and fisheries; iv) Tourism; v) Mining and Extractive Industries; etc., will elaborate **Sector Biodiversity Targets** within the general orientation of the General and Ecosystem Targets and taking into consideration sector peculiarities and the need to integrate biodiversity into these activities.

CHAPTER V ACTION PLAN

5.1 A LOGICAL FRAMEWORK

In a logical framework, the Biodiversity Strategic Goals and Targets have been translated into general actions for interventions with specific ecosystem priorities identified for each Strategic Goal following key guidelines of the ecosystem approach under the CBD; with due consideration to the following issues:

- Focus on the functional relationships and processes within ecosystems.
- Enhance benefit-sharing.
- Use adaptive management practices.
- Carryout management actions at the appropriate scale, with decentralisation to lowest appropriate level.
- Ensure inter-sectoral cooperation.

Within this framework the revised NBSAP is composed of the following seven basic inter-woven elements:

- Strategic Goals
- Targets
- Priority Actions for Intervention
- Time frame
- Performance Indicators
- Implementing Organisations
- Stakeholder analysis and participation

5.1.1 STRATEGIC GOALS

The Strategic Goals as defined in the previous chapters provide the four major areas for intervention . These areas are aimed at redressing the drivers of ecosystem degradation and biodiversity loss (Strategic Goal A); the consequences of the drivers on the physical and ecological environment (Strategic Goal B); the consequences on the socio-economic environment (Strategic Goal C); and strengthening the capacity measures to managing biodiversity loss (Strategic Goal D).

5.1.2 TARGETS

Realising the Goals defined in the four major areas has been set by 20 Targets which should be met. For each Goal a set of Targets have been defined and provide the orientation to identify actions which will enable the redress of specific issues that contribute to the loss of biodiversity.

The plan adopts a flexible approach. Driven by the NBSAP Principle 4 on adaptive management, this planning document has maintained the option of an ecosystem approach. In ensuring that the challenges and specificities of the 6 priority ecosystems are addressed, ecosystem-based targets have been defined within the four defined intervention areas. Ecosystem-based specific targets are not in exclusion of the general targets but ensure that specificities of ecosystems are taken into consideration. Priorities for the Strategic Goals and Targets also set a flexible stage for sector-based intervention based on the specificity of each sector and give the responsibility to each sector to lead, in a highly consultative manner, the process of defining sector based priorities.

Again, the targets provide a context for developing large and medium size projects with a focused orientation in addressing key challenges of biodiversity.

5.1.3 PRIORITY ACTIONS FOR INTERVENTION

In a systematic approach, priority actions have been identified for each target. While the actions identified may not be exclusive for intervention, these actions constitute the high priority and medium priorities for interventions that will enable a significant contribution to the realization of the goals within the defined time frame for the plan.

The actions have also been translated into a matrix to enable an effective determination of the time frame for action, performance indicators and the actors/organisations responsible for the implementation.

5.1.4 TIME FRAME

In compliance with Principle 10 of this document, setting the time frame for intervention seeks to be in coherence with both national and global processes. The time frame of 2020 for all targets is the preferred option and is compliant with the commitments made under the Convention on Biological Diversity and enables coherence with the timeframe of the 2011-2020 Strategic Plan for the Convention and the Aichi Targets for Biodiversity.
The time frame opted for by the National Biodiversity targets also ensures coherence in interventions with the budget program approach set on a 3 yearly basis.

5.1.5 PERFORMANCE INDICATORS

Monitoring and evaluation to determine the extent of progress in the implementation of this plan can only be effective where pre-determined criteria indicators set to measure progress. Indicators have thus been identified for each action to determine progress in performance towards the realization of each target and the strategic goal.

5.1.6 IMPLEMENTING ORGANISATIONS

The Plan recognizes the role of all actors in the ensuring the effective conservation and sustainable use of biodiversity. These actors who were consulted and participated in developing the revised NBSAP, have been identified with regard to their specific mandates and areas of interventions to participate in the implementation of the plan.

5.1.7 STAKEHOLDER ANALYSIS AND PARTICIPATION

The implementation of the action plan goals and targets is designed to be participatory including many actors especially the government, NGOs, local communities, sub regional organisations, private sector, bilateral organisations, international organisation, regional organisations and parastatals. A framework for multi-partners stakeholders' participation in the implementation of the NBSAP has been presented inFigure 5.1 below, while the specific responsibilities of stakeholders are described in the Tables of Matrices in Section 5.2 below.

5.2 SYNERGIES

The 2012 NBSAP is not a stand-alone document. Therefore for an effective implementation of the plan, it has been designed to be in synergy with other national plans, laws and programmes that directly have implication on biodiversity conservation, sustainable use and benefit sharing, as well as taking into consideration the MEAs and other international agreements of which Cameroon is party. These instruments which have been discussed in Chapter 2/Section 2.4 are listed below to recapitulate:

Box 5.1 Synergy between the National Biodiversity Targets and the Aichi Targets

CDB			SPANB	
Knowledge	1		1	Knowledge
Mainstreaming	2		2	Science /information
Incentives and subventions	3		3	Pollution
Stakeholder planning in Sustainable Production/Consumption	4		4	Sustainable Production/consumption
Sustainable management of Habitat and ecosystems	5		5	Strengthen legislation and regulations
Sustainable management of fish stocks and aquatic resources	6		6	Reduce rate of degradation and fragmentation of ecosystems
Sustainable agriculture and sylviculture	7		7	Management of endemic and threatened species
Pollution	8		8	In situ and ex situ Management of extinct species
Control introduction of invasive alien species	9		9	Rehabilitation of degraded ecosystems
Reduce pressures on Coral reefs and vulnerable ecosystems	10		10	Adaptation to climate change
Protected area allocation and management	11		11	Management of protected areas
Improve status of extinct or threatened species	12		12	Management of genetic diversity
Strategy to reduce genetic erosion	13		13	Promote Community-based Biodiversity Conservation
Restoration of degraded ecosystems	14		14	Valuation of Biodiversity and integration national accounts
Contribute to carbon stock	15		15	Payment for Ecosystem Services
Implementation of ABS	16		16	Implementation ABS
Develop and implement NBSAPs	17		17	Strengthen Coordination
Respect of Traditional Knowledge	18		18	Sector/Decentraliseed Mainstreaming
Capacity building and technology transfer	19		19	Capacity Building
Funding	20		20	Funding

5.2.1 2011-2020 BIODIVERSITY STRATEGIC PLAN AND AICHI TARGETS

The NBSAP recognizes the CBD Strategic Plan for Biodiversity 2011-2020 and its Aichi Targets adopted in October 2010 (Decision X/2) as an ambitious new plan that provides an overarching framework for all the biodiversity–related conventions and biodiversity issues at national level. Setting the National Biodiversity vision, the four strategic goals, 20 General Targets and the 10 ecosystem specific targets was guided by this overarching framework. See Table below. In translating the provisions to national realities the NBSAP provides an appropriate national orientation for effective response to the increasing loss of Bioiversity.

5.2.2 BIODIVERSITY RELATED INTERNATIONAL CONVENTIONS

The NBSAP is designed in compliance with the Strategic Plan of the CBD which in itself is a flexible framework relevant to all biodiversity-related conventions. Decision X/2 of the CBD calls for the Strategic Plan to be executed through other national, regional and international

activities. The CBD and several other Conventions *(Guidelines CITES, Guidelines CMS*) recognize the NBSAP as the tool for implementation not only of the CBD but the cluster of biodiversity related conventions. To ensure coherence and mutually supportive implementation of these conventions, the present NBSAP adopted a highly inclusive process through a targeted consultation with the national focal points of the biodiversity related conventions and the design of the priorities within this document.

Specifically, the United Nations Convention for the Fight Against Climate Change is translated nationally through the Climate Change Action Plan and the REDD+ Strategy. The NBSAP recognizes the link between CC and biodiversity and thus creates a window through Target 10 and other related targets with priority actions to reduce the impact of CC through ecosystem based adaptation measures such as e-Target 6 on alternative energy and e-Target 9 on rehabilitation of sites degraded by floods. Furthermore, Target 15 recognizes the potential REDD+ mechanism as critical in guaranteeing biodiversity safeguards and benefit sharing and most significantly in ensuring coordination and harmonization for mainstreaming in key development sectors.

The United Nations Convention to Combat Desertification is the sole legally binding international agreement linking environment and development to sustainable land management in the arid, semi-arid and dry sub-humid areas. The cosystem approach adopted by the NBSAP enabled a focused attention on key priorities within the National Strategy for Desertification and related programs to be taken into consideration within the Semi Arid Ecosystem. Within this ecosystem e-Target 9 opts for the rehabilitation of sites degraded by drought and e-Target 6 on the promotion of alternative energy to reduce pressure on fuel wood resources.

The NBSAP seeks to ensure coherence with the national priority actions for the Ramsar Convention on Wetlands which provides the framework for international cooperation on the conservation and wise use of wetlands and their resources. Generally the NBSAP recognizes the ecosystem management approach which favors wetland protections and further creates a specific window in e-Target 10 of the Freshwater ecosystem which calls for coherence with the management principles of the Ramsar Convention opts for management plans for wetlands of great significance and restoration of degraded fresh water catchment zones.

The Convention on International Trade on Endangered Species (CITES)seeks to ensure that international trade in animal and plant speciesis sustainable and does not threaten their survival or contribute to the increasing rate of biodiversity loss. The Convention on the Conservation of Migratory Species of wild animals (CMS) aims to conserve terrestrial, aquatic and avian migratory species throughout their range. Based on guidance from the Secretariat of the CBD and CITES, specific attention has been given in the NBSAP revision process to ensure collaboration among the National Focal Points of these Conventions and to secure input from both CITES and CMS national priorities. As an outcome, the NBSAP recognizes illegal commercial trade in wildlife species and commercial trade in specific or limited plant species as a cause of pressure. Several targets opt for conservation and sustainable use measures of these wild life species. These include Target 2 and 12 which opt for increased knowledge on the value of species including wild species that can be valorized and marketed; Target 8 for species conservation; Target 17 promotes an innovative coordination plateform of CBD/CITES/CMS National focal points.

5.3 MATRIX OF ACTIONS

STRATEGIC GOAL A: ADDRESS THE UNDERLYING CAUSES OF BIODIVERSITY DEGRADATION AND LOSS BY REDUCING THE DIRECT AND INDIRECT PRESSURES ON BIODIVERSITY.

Table 5.1: Matrix of Targets, priority actions, time frame, performance indicators and implementation institutions for Goal A

TARGET 1: AT LEAST 80% OF THE POPULATION IS AWARE OF THE IMPORTANCE OF BIODIVERSITY WITH AN INCREASED KNOWLEDGE ON THE LINK AND IMPACT OF HUMAN ACTIVITIES ON THE MAJOR ECOSYSTEMS				
Priority Actions	Time Frame (baseline: 2012)	Performance Indicators	Implementing Institutions.	
			Lead institution	Collaborating institutions
1.1 Develop and implement a Communication, Education and Public Awareness (CEPA) strategy for Biodiversity	2020	1.1.1 Biodiversity CEPA strategy document developed, 1.1.2 Nature and number of Biodiversity CEPA tools developed;	MINEPDED; MINRESI	MINEPDED, MINCOM MINEDUC, MINESEC MINESUP, MINCOMMERCE UNIVERSITIES Decentralised local authorities, NGOs
1.2 Mainstream the CEPA strategy on Biodiversity into the curricula of all levels of education.	2018	1.2.1 Number of schools with incorporated elements of biodiversity conservation in curricula. 1.2.2 Number of School Programs on biodiversity		
1.3 Develop specific programs targeted at increasing private sector awareness and securing corporate investments in biodiversity.	2018	1.3.1 An established Private Sector Engagement Program 1.3.2 Number of Biodiversity supported initiatives by the Private Sector		
1.4 Promote and encourage the effective stakeholder participation in the stewardship of the biodiversity in all sectors.	2016	1.4.1 Institutional Map of Biodiversity Stakeholders		
TARGET 2: BY 2020 SIGNIFICANT INCREASE IN THE CONTRIBUTION OF SCIENTIFIC BASED INFORMATION INTO BIODIVERSITY DECISION MAKING PROCESSES AND MANAGEMENT INTERVENTION				
Actions.	Time Frame	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
2.1 Facilitate biodiversity targeted and relevant research.	2016	2.1.1 An established Biodiversity priority needs for research; 2.1.2 Number of scientific publications with key findings on biodiversity issues	MINEPDED	MINEPDED, MINRESI MINADER, UNIVERSITIES RESEARCH

2.2 Improve taxonomic knowledge and use of geo-referenced data in biodiversity planning	2017	2.2.1 Number of persons/institutions carrying out inventory to improve taxonomic knowledge; 2.2.2 Number of institutions using Geo-referenced data in biodiversity planning;		INSITUTIONS, CHM NGOs (CIFOR,IUCN WWF), CAS
2.3 Establish a National Red Data Book for flora and fauna and make accessible to users	2016	2.3.1 A published National Red Data Book for both both flora and fauna; 2.3.2 Number of institutions/persons using NRB (i.e. visiting websites and central portal for biodiversity information, etc.)		
2.4 Establish a Science-Policy Biodiversity and Ecosystem (SPBES) Platform for the generation and dissemination of viable biodiversity science information targeted at decision makers and managers.	2018	2.4.1 An operational National SPBES Plateform; 2.4.2 Number of research projects on ecosystem and species-specific biodiversity issues carried out; 2.4.3 Number of information tools produced by SPBES platform; 2.4.4 Number of institutions/persons using tools for biodiversity decision making and management;		
2.5 Maintain and make fully accessible the existing central information portal on biodiversity to facilitate more informed decision-making	2020	2.5.1 The existing central information portal on biodiversity is fully operational, accessible and informs decision-making. 2.5.2 Number and type of information uploaded on the biodiversity central portal; 2.5.3 Number of downloads per week/month/year;	MINEPDED	MINEPDED

TARGET 3: BY 2020, ALL FORMS OF POLLUTION FROM WATER AND LAND-BASED ACTIVITIES HAVE BEEN BROUGHT TO LEVELS THAT ARE NON-DETRIMENTAL TO ECOSYSTEM FUNCTIONS

Actions	Time Frame	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
3.1 Carry out environmental impact assessment on all projects to reflect state of biodiversity based on no-net-loss, as well as design and implement mitigation measures.	2018	3.1.1 Number of EIAs carried out for development projects that reflect state of biodiversity (based on "no-net-loss") by project promoters; 3.1.2 Number of EMP implemented in an effective and efficient manner annually;	MINEPDED	Ministères Concernés, All Sectors Decentralised local authorities, Private Sector, NGOs
3.2 Intensify the monitoring and control of the use and management of chemical pollutants in compliance with defined norms	2018	3.2.1 Number of inspections/controls and Offense Statements (PVI and PVCI) established;		
3.3 Establish and ensure the implementation of waste management plans	2018	3.3.1 Number of decentralised local authorities (CTD) and other institutions with approved functional Waste Management plans; 3.3.2 Quantity of waste collected, treated and/or recycled annually;		

3.4 Establish and ensure the implementation of approved waste management plans in extractive and construction industry, small holder and agro-industrial plantations.	2018	3.4.1	Number of approved functional Waste Management plans implemented in a satisfactory manner in industries		
3.5 Draw up an Inspection program for existing waste treatment plants in the country and ensure their effective rehabilitation and use.	2018	3.5.1	Number of treatment facilities controlled, rehabilitated and functional		
TARGET 4: AN ECOLOGICALLY SUSTAINABLE SYSTEM OF PRODUCTION AND CONSUMPTION IS ESTABLISHED BASED ON SUSTAINABLE PRACTICES WITH APPROPRIATE INVESTMENTS.					
Actions	Time Frame	Performance Indicators		Implementing Institutions	
				Lead institution	Collaborating institutions
4.1. Promote and support the alternative consumption of new species and diversify varieties for commercialization	2016	4.1.1 4.1.2	Number of new species promoted, supported and consumed; Number of diversified varieties commercialized;	MINCOMMERCE MINEPIA, MINADER, MINFOF	MINEPDED; MINFOF MINEPIA; MINADER MINTOUR, MINPMEESA;
4.2 Promote and support sustainable Small and medium size Enterprises using production methods with less pressure on specific species	2016	4.2.1	Number of SME applying sustainable production methods based on developed standards;		
4.3 Identify and Promote the use of alternative energy options favourable to ecosystems	2016	4.3.1 4.3.2	Type of alternative energy promoted; Number of persons using alternative energy;		
4.4 Promote the sustainable management of production landscapes in key development sectors	2018	4.4.1 4.4.2	Certification schemes for selected products put in place; Quantity of certified products commercialized;	MINEPAT	MINADER; MINEPDED; MINEPIA; MINCOMMERCE
TARGET 5: **BY 2020 BIODIVERSITY-RELATED LAWS AND REGULATIONS ARE STRENGTHENED AND MADE COHERENT IN ORDER TO AVOID CONFLICTING USES AND COMBAT ILLEGAL PRACTICES**					
Actions	Time Frame	Performance Indicators		Implementing Institutions	
				Lead institution	Collaborating institutions
5.1 Build Capacity and ensure compliance with Biodiversity related Multilateral Agreements	2018	5.1.1 5.1.2 5.1.3 5.1.4 5.1.5	Number of Capacity Building Program for Biodiversity MEAs Adhesion Instrument to ABS Protocol. Adhesion instrument to Supplementary Protocol for Redress in the event of damage from the movement of living modified organisms adhered to. Number of MEAS implemented in synergy with CBD; Proportion of national biodiversity legal instruments with inconsistencies vis-à-vis international biodiversity-related instruments;	MINEPDED	MINEPDED; MINFOF; MINADER; MINEPIA

5.2 Revise Sector policy and laws to ensure coherency with biodiversity policy, laws and regulations and strengthen law enforcement	2018	5.2.1 5.2.2 5.2.3 5.2.4 5.2.5	Level of involvement of the Administration in charge of Biodiversity and sector specific issues in the revision process; Number of referrals (provisions) of legal instruments related to biodiversity issues; Number of Sector policies/ laws revised that address biodiversity issues; Level of implementation of legality framework for exploitation of resources Level of National compliance with 4 objectives of PAPECALF on wildlife law enforcement	MINDCAF;	MINEPDED, MINADER, MINFOF, MINEPIA,
5.3 Develop and ensure the effective implementation of Land use plans to reduce conflicting uses	2018	5.3.1 5.3.2 5.3.3	Land- Use Plan Number of conflicts registered between different actors; Number and type of actors involved in land-use planning;	MINEPAT	Min i/c Lands; Min i/c State Property
5.4 Identify and analyse conflicting policies and laws related to Biodiversity and ensure revision for coherence	2019	5.4.1	Number of revised Sector laws with provisions related to Biodiversity and conflict prevention or settlement	MINEPDED;	MINEPDED; MINFOF; MINADER; MINEPIA; MINRESI; MINEPAT, MINJUSTICE

STRATEGIC GOAL B: MAINTAIN AND IMPROVE THE STATUS OF BIODIVERSITY BY SAFEGUARDING ECOSYSTEMS, HABITATS, AND SPECIES AND GENETIC DIVERSITY

Table 5.2: Matrix of Targets, priority actions, time frame, performance indicators and implementation institutions for Goal B

TARGET 6: BY 2020 THE RATE OF DEGRADATION AND FRAGMENTATION OF ECOSYSTEMS AND THE LOSS IN HABITATS IS SIGNIFICANTLY REDUCED AT LEAST BY HALF.				
Actions	Time Frame (baseline: 2012)	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
6.1 Conduct biodiversity assessments/inventories of natural habitats of forests including mangroves, wetlands, riparian areas around river banks, lake shores, and un-protected biodiversity hotspots	2018	6.1.2 Number of persons/Institutions carrying out inventories and biodiversity assessment of natural habitats 6.1.3 Biodiversity updates and alerts	MINEPDED,	MINEPDED, MINFOF, MINRESI/IRAD
6.2 Develop and implement management plans for natural habitats under protection.	2018	6.2.1 Number of management plans developed for protected areas 6.2.2 Number of natural habitats under protection with functional management plans;		

		6.2.3 Total Surface area under protected management		

TARGET 7: BY 2020 ENDEMIC AND THREATENED SPECIES OF FLORA AND FAUNA SHOULD BE SUSTAINABLY MANAGED				
Actions	Time Frame	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
7.1 Establish and implement the strategy/program for the control and prevention of biological invaders (invasive alien species, living modified organisms)	2019	7.1.1 A National strategy to monitor and control biological invaders operationalized 7.1.2 Number and type of authorized LMOs under control 7.1.3 -surface area occupied by invasive alien species monitored and controlled;	MINEPDED,	MINEPDED, MINADER MINFOF, MINEPIA MINRESI, MINCOMMERCE MINATD, FEICOM DECENTRALISED LOCAL AUTHORITIES
7.2 Establish and implement a programme/project for the management of threatened and endangered species.	2019	7.2.1 umber of operational projects put in place to manage endemic and threatened species; 7.2.2 Rate of population growth of species;		
7.3 Establish and implement decentralised local authority management programs for threatened and endangered species.	2019	7.3.1 Number of Pilot Decentralised local authorities with participatory management programs for threatened and endangered species; 7.3.2 Rate of population growth of threatended and endangered species in pilot area		
7.4 Establish and implement decentralised local authority management programs to fight biological invaders and Invasive Alien Species.		7.4.1 umber of Decentralised Local Authorities with management plans to fight biological invaders and invasive alien species; 7.4.2 urface area under monitoring and control		

TARGET 8: BY 2020 RE-ESTABLISH AND/OR RECOVER LOCAL EXTINCT SPECIES IN-SITU AND EX-SITU AND MAINTAIN A LEVEL OF CONSERVATION THAT ENSURES LONG TERM SUSTAINABILITY				
Actions	Time Frame	Performance Indicators.	Implementing Institutions	
			Lead institution	Collaborating institutions
8.1 Implement species conservation and recovery programmes, both at in-situ and ex-situ levels.	2018	8.1.1 Number of Functional arboreta, zoos developed for key ecosystems; 8.1.2 Number of species re-established and/or recovered;	MINEPDED,	MINEPDED, MINFOF, MINEPIA , MINRESI/IRAD
8.2 Use PAs for ex-situ conservation and create and/or extend existing green corridors around PAs.	2018	8.2.1 Number of gene banks established for threatened species 8.2.2 Number/surface area of green corridors	MINFOF	MINFOF, MINEPDED; MINRESI/IRAD

		created around PAs.		
TARGET 9: BY 2020 DEGRADED ECOSYSTEMS/HABITATS SHOULD BE REHABILITATED TO RE-ESTABLISH AND/OR RECOVER LOST SPECIES AND MAINTAINED AT A LEVEL OF CONSERVATION THAT ENSURES LONG-TERM SUSTAINABILITY.				
Actions	Time Frame	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
9.1 Develop and implement Rehabilitation programs for degraded ecosystems/habitats	2020	9.1.1 Surface area of degraded ecosystem/habitats restored; 9.1.2 Annual rate of restoration of lost species;	MINEPDD;	MINEPDD; , MINFOF, MINEPIA , MINRESI/IRAD NGOs
9.2 Develop and implement ecosystem specific rehabilitation programs for degraded ecosystems/habitats	2018	9.2.1 Surface area of specific ecosystem/habitat rehabilitated; 9.2.2 Annual rate of restoration of lost species per specific ecosystem	MINEPDD;	MINEPDD; , MINFOF, MINEPIA , MINATD, MINRESI/IRAD NGOs
TARGET 10: BY 2020, THE NEGATIVE IMPACTS OF CLIMATE CHANGE AND CLIMATE VARIATION ON ECOSYSTEMS AND HUMAN WELL-BEING ARE SIGNIFICANTLY REDUCED THROUGH ECOSYSTEM-BASED CLIMATE CHANGE ADAPTATION MEASURES.				
Actions	Time Frame	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
10.1 Identify and replicate good ecosystem-based lessons-learnt on climate change adaptation and mitigation projects	2018	10.1.1 Number of CC mitigation and adaptation projects efficiently and effectively implemented in vulnerable ecosystems.	MINEPDED	MINEPDED, MINEPIA, MINRESI/IRAD NGOs
10.2 Render Operational the National Observatory on Climate Change	2018	10.2.1 Texts of application and designation of personnel of the National Observatory on CC; 10.2.2 CC Fact sheets published regularly		
10.3 Establish and implement freshwater quality norms for human consumption and biodiversity survival based on climate change and variation	2019	10.3.1 Number of standards/guidelines developed; 10.3.2 Number of institutions in compliance with standards/guideline	MINEPDED	MINRESI-CRH, MINESUP NGOs ANOR
TARGET 11: BY 2020, AT LEAST 30% OF THE NATIONAL TERRITORY, TAKING INTO CONSIDERATION “ECOSYSTEM REPRESENTATIVENESS” IS UNDER EFFECTIVELY AND EQUITABLY MANAGED PROTECTED AREAS				
Actions	Time Frame	Performance Indicators.	Implementing Institutions	
			Lead institution	Collaborating institutions
11.1 Establish and implement programmes for the restoration of degraded PAs and valorise PA biodiversity.	2020	11.1.1 Number of programs for restoration of degraded PAs; 11.1.2 % increase in number/surface of protected areas per category 11.1.3 % of PAs under effective management	MINFOF	MINEPDED, MINFOF, MINRESI/IRAD, National UNESCO Commision

		plans 11.1.4 Number of biodiversity species valorized;		
11.2 Establish PA's in fragile ecosystems and biodiversity hotspots in marine and semi-arid ecosystems	2020	11.2.1 Number & proportion of PAs in marine and semi-arid ecosystems		
11.3 Propose more PAs to be nominated as UNESCO Biosphere Reserves (BRs)	2018	11.3.1 Number & proportion of PAs as biospheres reserves		
11.4 Develop and implement an Access and Benefit Sharing scheme for national protected areas.		11.4.1 Developed ABS scheme for PA 11.4.2 Number of capacity building workshops ; 11.4.3 Nature and amount of benefit from PA Revenue shared with local/riparian communities	MINFOF	MINEPDED, MINFOF, MINRESI/IRAD, MINMIDT, National UNESCO Commision, local communities

TARGET 12: BY 2020, THE GENETIC DIVERSITY OF CULTIVATED PLANTS, DOMESTICATED ANIMALS, AND THEIR THREATENED WILD RELATIVES INCLUDING CULTURALLY VALUABLE SPECIES, ARE MAINTAINED AND VALORISED				
Actions.	Time Frame	Performance Indicators.		
12.1 Establish inventory of threatened genetic species of crops and livestock including their wild relatives, NTFPs, and species with potentials for commercialization	2019	12.1.1 Number of threatened genetic species established in the inventory;	MINEPDED	MINFOF, MINRESI/IRAD, MINEPIA , MINADER
12.2 Develop and implement management plans for threatened genetic diversity of cultivated plants, domesticated animals, and their wild relatives	2O20	12.2.1 Number of Management Plans implemented; 12.2.2 Number of threatened genetic species maintained and valorised;	MINEPDED	MINEPIA, MINRESI/IRAD, MINEPIA , MINADER
12.3 Promote the valorisation of genetic species with potentials for commercialisation and cultivation of threatened marketable genetic species.		12.3.1 Number of genetic species with potentials for commercialisation valorised; 12.3.2 Number of threatened marketable genetic species cultivated;	MINEPDED	MINEPDED, MINEPIA , MINF

TARGET 13: BY 2020 COMMUNITY-BASED BIODIVERSITY CONSERVATION AND ECOSYSTEM MANAGEMENT APPROACHES SHOULD BE PROMOTED.				
Actions	Time Frame	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
13.1 Promote the creation of more community-based biodiversity conservation forests and incorporate biodiversity conservation activities in both newly created and existing ones.	2018	13.1.1 Number of Community-based forests created. 13.1.2 Number of Community-forests in which	MINFOF	MINFOF; MINEPDED, , MINRESI/IRAD.

		biodiversity conservation has been incorporated. 13.1.3 Guidelines for incorporation of biodiversity conservation and ecosystem management in Community forests		
13.2 Promote the establishment and sustainable use of sacred forests as community entities and incorporate biodiversity conservation activities in the management plans of these forests	2018	13.2.1 Number/surface area of sacred forests established 13.2.2 Number of sacred forests with management plans that incorporate biodiversity conservation and ecosystem management approaches; 13.2.3 Biodiversity species assessed in sacred forest with cultural and spiritual values for conservation;		

STRATEGIC GOAL C: PROMOTE THE SUSTAINABLE USE OF BIODIVERSITY FOR WEALTH CREATION AND POVERTY ALLEVIATION

Table 5.3: Matrix of Targets, priority actions, time frame, performance indicators and implementation institutions for Goal C

TARGET 14:BY 2020 THE DEVELOPMENT AND IMPLEMENTATION OF A COMPREHENSIVE PROGRAM FOR THE VALUATION OF BIODIVERSITY SHOULD HAVE BEEN REALISED AND PAYMENTS FOR ECOSYSTEM SERVICES AND GOODS IMPUTED INTO THE NATIONAL BUDGET FOR USE IN PROMOTING SUSTAINABLE BIOLOGICAL AND GENETIC RESOURCES PROGRAMMES.				
Actions	Time Frame	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
14.1 Study on Economic Valuation of Biodiversity and Payment of Ecosystem Services (PES) and Development of Tools for their integration in the national accounting system	2015	14.1.1 In-depth study of economic value of biodiversity and ecosystem services. 14.1.2 Mapping and assessment of the state of biodiversity resources, ecosystems and their services for National Economic accounting and reporting purposes 14.1.3 Type of Economic tools for quantification and integration of the value of biodiversity resources and ecosystem services in national accounts;	MINEPDED MINEPAT	MINEPDED, MINFOF, MINEPIA, MINRESI/IRAD

14.2 Building of Capacity on use of tools for biodiversity and ecosystem services national accounting \	2016	14.2.1 Number of capacity building workshops carried out; 14.2.2 Number of persons trained on use of economic tools 14.2.3 Proportion of GDP from Biodiversity Resources and Ecosystem Services		
TARGET 15: BY 2020, THE ESTABLISHMENT AND IMPLEMENTATION OF MECHANISMS FOR THE PAYMENTS FOR ECOSYSTEM SERVICES, INCLUDING CARBON STOCKS, SHOULD GENERATE INCREASED REVENUE.				
Actions.	Time Frame	Performance Indicators	Implementing Institutions.	
			Lead institution	Collaborating institutions
15.1 Carry out an assessment and evaluation of carbon stocks in all ecosystems	2016	15.1.1 Estimated quantity of Carbon stock per ecosystem (in tons of CO_2 equivalent)	MINEPDED	MINEPDED, MINFOF, MINEPIA, MINRESI/IRAD
15.2 Put in place compensation mechanisms to benefit from efforts made within the conservation framework in ecosystems (REDD+).	2018	15.2.1 REDD+ Strategy and Action Plan Adopted and implemented 15.2.2 Total revenue generated from the sale of Carbon stocks		
15.3 Encourage corporate and private sector initiatives to undertake voluntary payments for biodiversity and other PES schemes 15.4 Carry out study to assess the impact of	2014	15.3.1 Mechanism for corporate & private sector Payment of use of Biodiversity and ecosystem service established; 15.3.2 Total revenue generated from payments for biodiversity and Ecosystem Services schemes by Corporate and Private sector initiatives;		
TARGET 16: BY 2020, THE SHARING OF BENEFITS FROM PAYMENTS FOR THE SUSTAINABLE UTILISATION OF BIODIVERSITY, GENETIC RESOURCES AND ASSOCIATED TRADITIONAL KNOWLEDGE SHOULD INCREASE INCOMES OF LOCAL COMMUNITIES.				
Actions	Time Frame	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
16.1 Complete the putting in place of the legal, institutional and regulatory instruments for ABS	2018	16.1.1 Adhesion to the ABS Protocol 16.1.2 Existing ABS Legislation and regulatory instruments 16.1.3 Designated competent national authorities for ABS 16.1.4 Level of enforcement of the ABS legislation	MINEPDED	MINEPDED, MINFOF, MINEPIA, MINRESI/IRAD National Assembly
16.2 The implementation of ABS frameworks for payments for commercial and non-commercial research in protected areas	2018	16.2.1 Amount of Annual revenue and other 16.2.2 Nature of benefits generated from payment of ABS activities (commercial and non-commercial research in protected areas) 16.2.3 Amount of Annual Revenue generated		

		from ABS activities 16.2.4 Proportion of revenue/benefits paid to beneficial local/riparian communities;		
16.3 Develop and Implement Capacity building program for ABS Regime.	2019	16.3.1 Capacity building program on ABS developed 16.3.2 Number and type of tools for ABS Capacity building 16.3.3 Number and type of capacity building workshops 16.3.4 Number and category of persons trained on ABS; 16.3.5 Number of ABS agreements signed		
16.4 Carryout a Pilot Initiative for the Protection and valorization of traditional knowledge associated with biological and genetic resources,	2018	16.4.1 Study on the protection and valorization of TK; 16.4.2 Pilot Protection of Traditional knowledge		
16.5 Establish programmes/projects that enhance Access and Benefit Sharing, to ensure that stakeholders adequately gain from biodiversity conservation action.	2020	16.5.1 Number of ABS projects; 16.5.2 Number and type of genetic or biological resources under ABS regimes; 16.5.3 Nature and amount of benefit generated; 16.5.4 Number and category of beneficiaries		
16.6 Establish community and national networks for ABS	2020	16.6.1 Nature and number of ABS networks		

STRATEGIC GOAL D: MAINSTREAM BIODIVERSITY IN SECTOR AND LOCAL LEVEL STRATEGIES AND STRENGTHEN THE COORDINATION AND CAPACITY FOR IMPLEMENTATION

Table 5.4: Matrix of Targets, priority actions, time frame, performance indicators and implementation institutions for Goal D

TARGET 17: BY 2020, BIODIVERSITY RELATED COORDINATION MECHANISMS SHOULD BE FULLY FUNCTIONAL AND STRENGTHENED				
Actions	Time Frame	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
17.1 Establish and Make operational the National Biodiversity Coordination Committee (NBCC) with sector and local regional units to ensure coherence and successful follow up and reporting on biodiversity issues;	2019	17.1.1 A functional National Biodiversity Coordination Committee; 17.1.2 Number of Sector and Regional Focal Points designated; 17.1.3 Number of national, sector and regional reports validated 17.1.4 Number of NBCC sessions held annually;	PM's Office	MINEPDED MINFI Sector Representatives CSO
17.2 Functioning Bureaux set up and staff designated for relevant National organs	2019	17.2.1 Number of functional coordination bodies set up to handle biodiversity issues; 17.2.2 Number and type of personnel; 17.2.3 Amount of budget and logistics allotted to each National Organ;		
17.3 Strengthen the functioning of the National Fund for Environment and Sustainable Development.	2016	17.3.1 Accountant appointed; 17.3.2 Amount of State Subsidies disbursed for biodiversity issues;		

TARGET 18: By 2020 KEY PRODUCTION SECTORS AND DECENTRALISED LOCAL AUTHORITIES SHOULD HAVE DEVELOPED SECTOR OR REGION SPECIFIC BIODIVERSITY TARGETS LINKED TO THE NATIONAL TARGETS				
Actions	Time Frame	Performance Indicators.	Implementing Institutions.	
			Lead institution	Collaborating institutions
18.1 Development and implementation of sector specific biodiversity targets with action plans by key production ministries	2015	18.1.1 Guidelines for mainstreaming Biodiversity in Production Sectors is available 18.1.2 Level of mainstreaming of NBSAP in sector specific strategy document; 18.1.3 Number of Sector ministries endowed with defined Biodiversity targets; 18.1.4 Number of biodiversity programs and projects set up and implemented by each sector; 18.1.5 Number of biodiversity programs and projects carried	PM's Office MINEPAT	MINEPDED, MINFOF, MINADER, MINRESI MINEPIA, MINFI, MINEE MINCOMMERCE, MINTOUR IRAD, MINMIDT MINATD, DECENTRALISED LOCAL

		out by MINEPDED in partnership with Sector Ministerial Departments.		AUTHORITIES
18.2 Development and implementation of pilot programs for biodiversity mainstreaming in decentralised local plans	2017	18.2.1 Guidelines for mainstreaming Biodiversity in decentralized and local Council Plans is available 18.2.2 Number of Regions/Local councils endowed with Biodiversity targets and Action Plan; 18.2.3 Number of biodiversity pilot programs and projects set up and implemented by Regions/Local councils 18.2.4 Number of biodiversity programs and projects carried out by MINEPDED in partnership with Regions/ Local Councils;		
18.3 Planning and Budgeting by supervisory authorities and key sectors to facilitate mainstreaming of biodiversity in national and sector program budgets	2016	18.3.1 Biodiversity sector programs with investment budgets available 18.3.2 Budget allocation for biodiversity in GESP; 18.3.3 Budget allocations for Biodiversity Projects and programs in sector PIB;		

TARGET 19: BY 2020, THE CAPACITY OF KEY ACTORS SHOULD BE BUILT AND GENDER MAINSTREAMING CARRIED OUT FOR THE EFFECTIVE IMPLEMENTATION OF THE BIODIVERSITY TARGETS				
Actions	Time Frame	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
19.1 Development and Implementation of a Capacity Building program for key Biodiversity stakeholders;	2014	19.1.1 Number of biodiversity training modules elaborated and validated; 19.1.2 Number of biodiversity training workshops organized; 19.1.3 Number of stakeholders trained;	MINEPDED	NGOs, MINEPIA;
19.2 Development and application of tools for outreach on newly adopted Biodiversity Targets and Action Plan	2014	19.2.1 Number of Outreach tools developed; 19.2.2 Number of NBSAP dissemination workshops organised; 19.2.3 Number of beneficiaries/recipients	MINEPDED	MINEPDED; MINFOF, MINADER; MINRESI MINEPIA; MINEPAT
19.3 Provide Training and scholarships to expand expertise on key aspects of biodiversity	2014	19.3.1 Number of persons trained from diverse sectors; 19.3.2 Number of workshops organized; 19.3.3 Number of beneficiaries fromscholarships;	MINEPDED	MINEPDED; MINFOF; MINADER; MINRESI; MINEPIA; NGOs.
19.4 Study for the collection and generation of information on linkages between biodiversity and gender	2014	19.4.1 Report on gender/biodiversity Study	MINEPDED	MINEPDED
19.5 Development and application of tools for outreach and mainstreaming of gender during the implementation of all targets of the NBSAP	2014	19.5.1 Number of Outreach tools developed; 19.5.2 Number of biodiversity targets mainstreaming gender; 19.5.3 Number by gender category involved in Biodiversity projects and programs implementation;	MINEPDED	MINEPDED

TARGET 20: BY 2020 PARTNERSHIP SUPPORT AND FUNDING OF BIODIVERSITY PROGRAMS SHOULD HAVE INCREASED				
Actions	Time Frame	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
20.1 Strengthen and expand partnerships with regional, sub-regional and international Organizations, on biodiversity issues	2018	20.1.1 Number of partners involved in biodiversity issues;	MINEPDED	MINEP COMIFAC, CEFDHAC, ECCAS, AMCEN, NEPAD, UNEP, SCBD Private Sectors, International and National NGOs Key Sector Ministries
20.2 Organization of a Partnership Conference on the NBSAP	2016	20.2.1 Level of Partner Commitments; 20.2.2 Amount of support from Regional/Sub-regional/International partners;		
20.3 implementation of a resource mobilization strategy and plan to increase funding for biodiversity	2016	20.3.1 Amount of domestic financial support for Biodiversity per annum; 20.3.2 Amount of GEF funding for Biodiversity focal area 20.3.3 Amount of other multilateral funding for Biodiversity 20.3.4 Amount of bilateral funding for Biodiversity 20.3.5 Amount of Private Sector investment in Biodiversity programs and projects 20.3.6 Number of initiatives and amounts generated under innovative financing mechanisms to support biodiversity 20.3.7 Number of initiatives to heighten awareness on the need to increase or mobilie support for biodiversity		

ECOSYSTEM SPECIFIC TARGETS

Table 5.5: Matrix of Targets, priority actions, time frame, performance indicators and implementation institutions for ecosystem specific targets

MARINE/COASTAL ECOSYSTEM E- TARGET 1: BY 2020, ALL SOURCES OF COASTAL AND MARINE POLLUTION SHOULD BE EFFECTIVELY CONTROLLED TO REDUCE POLLUTION AND MITIGATE ITS IMPACT ON THE ECOSYSTEM.				
Actions	Time Frame (baseline: 2012)	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
E.1.1 Intensify mechanisms and programmes to control marine pollution	2016	• E 1.1.1 Number of effective collaboration protocols signed between MINEPDED and other stakeholders to monitor marine and coastal pollution; • E.1.1.2 Level of pollution load in marine/coastal ecosystem; • E1.1.3 Population trends of species in marine ecosystem;	MINEPDED	MINEPIA, MIDEPECAM, MEAO, NGOs, CBOs, Laboratories
E.1.2 Strengthening of control and inspections of coastal and marine sector activities with polluting effects,		• E.1.2.1 Nature and quantity of control equipment procured; • E.1.2.2 Number of functional environmental control posts created in marine environment; • E.1.2.3 Number of controls/inspections of pollution sources		
E.1.3 Strengthen and Support Community-based Beach Clean Up Programs		• E.1.3.1 Budget allocated for Beach litter Clean-up activities; • E.1.3.2 Number of capacity building/sensitization workshops to fight Marine/Coastal littering • E.1.3.3 Number of persons and organizations involved in beach litter clean-up campaigns;		
E-TARGET 2: BY 2020, MANGROVE FOREST AND ASSOCIATED COASTAL FOREST DEGRADATION AND LOSS SHOULD HAVE BEEN SIGNIFICANTLY REDUCED				
Actions	Time Frame (baseline: 2012)	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
E.2.1 Intensify on-going programmes on mangrove restoration and management including training on sustainable utilisation of the products of mangrove forests;	2014	• E.2.1.1 Surface area (ha) of mangrove forests replanted and/or regenerated annually; • E.2.1.2 Number of tree nurseries established and plant population in them; • E.2.1.3 Number of workshops • E.2.1.4 Surface area of mangrove forests under sustainable utilization	National NGOs	Local MINEPDED/MINFOF, private sector and councils
E.2.2 Intensify current programs for the alternative use of energy in coastal and marine environment	2016	• E.2.2.1 Number of projects promoting the use of alternative energy in the marine and coastal areas. • E.2.2.2 Number of improved ovens in use		

E.2.3 Put in place programmes to protect spawning grounds.	2016	• E.2.3.1 Surface area of spawning grounds regenerated and protected;	National NGOs	MINEPDED/MINFOF, private sector and Local councils
E- TARGET 3: BY 2020, COASTAL EROSION SHOULD BE REDUCED by 10% AND ERODED COASTAL BEACHES REHABILITATED.				
E.3.1 Develop and implement program to reduce coastal erosion	2016	• E.3.1.1 More studies on coastal erosion carried out • E.3.1.2 Established Baseline on coastal erosion • E. 3.1.3 Number of projects set up to control coastal erosion • E.3.1.4 Surface area of land protected and recovered from coastal erosion	MINEPDED	Local MINEPDED/MINFOF, private sector and councils, NGOs
E.3.2 Strengthen and support the use of local technology to rehabilitate and manage all eroded coastal beaches	2018	• E.3.2.1 Surface area of eroded beaches rehabilitated annually through the use of local technology	MINEPDED	MINEPIA, NGOs and Councils
TROPICAL DENSE HUMID FOREST ECOSYSTEM E-TARGET 4: DEVELOP AND/OR INTENSIFY INTEGRATED ACTION FRAMEWORKS ON ALL ACTIVITIES (MINING, INDUSTRIAL LOGGING, SMALLHOLDER AGRICULTURE, AND ILLEGAL LOGGING) THAT IMPACT ON FOREST BIODIVERSITY CONSERVATION, PROTECTED AREAS MANAGEMENT IN A MANNER THAT ENHANCES LOCAL GOVERNANCE.				
Actions	Time Frame (baseline: 2012)	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
E.4.1 Promote integrated approach and strengthen coordination of land use allocation in forest ecosystems	2016	• E.4.1.1 Number of integrated approaches promoted; • E.4.1.2 Number of established Multi-stakeholder Coordination structure (s) for land use allocation • E.4.1.3 Proportion of local communities' representatives in land-use allocation Structure (s); • E.4.1.4 Number of Environmental and Social Management Plans approved and jointly monitored by all stakeholders • E.4.1.5 Proportion of local population representatives in ESMP joint monitoring committees;	MINFOF	MINEPDED MINMIDT MINADER NGOs CBOs
E.4.2 Develop and effectively implement management plans for all forest types	2016	• E.4.2.1 umber of PAs with effective management plans that are integrated with biodiversity conservation programmes. • E.4.2.2 Number of FMUs with Forest Stewardship Certification	MINFOF	MINEPDED, NGOs CBOs
E.4.3 Develop and effectively implement management plans for designated Protected Areas and promote a National PA System that includes non-formal protected areas.	2016	• E.4.3.1 umber of designated PA that are effectively implementing a holistic management plan involving a high participation from CBOs • E.4.3.2 Percentage increase in cover quality and density of ecosystems and PAs	MINFOF	MINEPDED NGOs CBOs
E.4.4 Establish and ensure implementation of sustainable forest management systems in the informal forest sector	2016	• E.4.4.1 Number of sustainable forest management systems established and implemented in the informal forest sector	MINFOF	MINFOF; MINEPDED, NGOs

TROPICAL WOODED SAVANNAH ECOSYSTEM				
E- TARGET 5: BY 2020 BUSHFIRE INCIDENCE SHOULD BE REDUCED BY AT LEAST 30%				
Actions	Time Frame (baseline: 2012)	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
E.5.1 Set up a special project to intensify control and minimise impact of bushfires in biodiversity hotspots	2016	• E.5.1.1 Number of PAs/farming areas with buffer zones effectively created to protect them from bushfires and serve other purposes; • E.5.1.2 Number of training/capacity building workshops organised for targeted local communities on management of strategic burning	MINFOF	MINEPDED, NGOs CBOs, Graziers
E- Target 6: By 2020 the use of alternative energy should have increased and significantly reduced pressure on fuel wood.				
Actions	Time Frame (baseline: 2012)	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
E.6.1 Promote the use of alternative energy adapted to tropical wooded savannah ecosystem	2016	• E.6.1.1 Number of improved cooked stoves manufactured and distributed to vulnerable households; • E.6.1.2 Number of biogas projects implemented	MINEPDED	MINEE, MINFOF, MINEPIA MINRESI/IRAD NGOs
E.6.2 Promoting the development of local technologies on alternative energy		• E.6.2.1 Number of capacity building workshops organised for the promotion of local technologies on alternative energy • E.6.2.2 Number of local technologies identified and promoted;	MINEPDED	MINEE, NGOs, CBOs
E- Target 7: By 2020, at least 50% 0f target populations should have developed the capacity to reduce overgrazing				
Actions	Time Frame (baseline: 2012)	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
E.7.1 Develop and implement Capacity building programs for grazer communities to reduce overgrazing	2016	• E.7.1.1 Number of capacity building/training organised for targeted local communities.	MINEPIA	MINEPDED, NGOs CBOs
E.7.2 Promote and support forage production by local grazier communities	2016	• E.7.2.1 Surface area developed for improved forage production; • E.7.2.2 Number of local graziers adopting the new technology;	MINEPIA	MINEPDED, NGOs CBOs
Montane Ecosystem E- Target 8: *By 2020 Increase by 20% and strengthen Community-Based Biodiversity Conservation and Management initiatives for endangered montane species.*				
Actions	Time Frame (baseline: 2012)	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
E.8.1 Promote the establishment of Montane ecosystem community based management and incorporate management of endangered species and disasters in hotspots.	2014	• E.8.1.1 Number of community based projects established in which management of montane endangered species are incorporated • E.8.1.2 Population trends of endangered species in Montane ecosystem;	MINFOF	MINEPDED, NGOs

SEMI-ARID ZONE ECOSYSTEM E- Target 9: *By 2020 at least 25% of degraded sites from droughts and floods are rehabilitated*				
Actions	Time Frame (baseline: 2012)	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
E.9.1 Intensify programs for the rehabilitation of drought and flood zones in the semi-arid ecosystem	2014	• E.9.1.1 Surface area of degraded/flooded zones rehabilitated; • E.9.1.2 Number of improved cooking stoves distributed annually under the SAHEL Project;	MINEPDED	MINFOF, MINTP, COMIFAC, CEFDHAC, ECCAS, AMCEN, NEPAD, UNEP, SCBD Private Sectors, International and National NGOs Key Sector Ministries
FRESHWATER ECOSYSTEM E-Target 10: By 2020 wetlands of great significance should be under management plans and at least 10% of degraded fresh water catchment areas and riparian zones restored and protected				
Actions	Time Frame (baseline: 2012)	Performance Indicators	Implementing Institutions	
			Lead institution	Collaborating institutions
E.10.1 Establishment of National Water Resource Quality Management Plans which include flow allocations for the environment and ensuring in-stream barriers to movement of fauna are in place in the majority of catchments.	2016	• E.10.1.1 National Water Resource Quality Management Plans. • E.10.1.2 % area of river and groundwater systems for which environmental allocations have been substantially implemented; • E.10.1.3 % of waterways which conform to National Water Quality Management Strategy (Length/Number of waterways as measures) • E.10.1.4 % of area of catchments/regions covered by surface water resource management plans; • E.10.1.5 % of area of catchments/regions with groundwater resources which have water/resource management plans; • E.10.1.6 % of catchments with groundwater resources which are over-allocated or are approaching over-allocation.	MINEE	MINEPDED
E.10.2 Establish relevant standards and guidelines for a National Water Quality Management Strategy	2016	• E.10.2.1 Document on Standards & guidelines on water quality;	MINEE	MINEPDED, ANOR, CAMWATER, CDE,GWP, Water TaskShed
E.10.3 Carry out an assessment of all wetlands in the country, draw and implement management plans Consistent with management principles of Ramsar Convention on Wetlands	2016	• E.10.3.1 Number and surface area of wetlands recognised as of international importance; • E.10.3.2 Number and percentage of Ramsar and other internationally significant wetlands with management plans; • E.10.3.3 % area of significant water bird habitats covered by site management plans, species conservation plans, conservation agreements and other conservation programs; • E.10.3.4 Number of Biodiversity offsets to address the increasing demands and uses of wetlands for development projects.	MINEPDED	NGOs GWP

CHAPTER VI
IMPLEMENTATION MECHANISM, MONITORING, EVALUATION AND REPORTING

The 2000 validated NBSAP was weak on defining an implementation, monitoring and evaluation framework for the implementation of the plan The present NBSAP opts for a an implementation, monitoring and evaluation (M & E) to be an important component from the conception stage of the present NBSAP. This option has further allowed for an effective participation and contribution of local Communities, NGOs/Civil Societies and private sector in the design of the plan

6.1 IMPLEMENTATION MECHANISM

To effectively implement the NBSAP, it is necessary to use the existing institutional structures and mechanisms.

The Ministry of Environment, Protection of Nature and Sustainable Development, as the focal Institution charged with coordinating the protection of Biodiversity is charged with the Coordination of the implementation of this revised NBSAP.

In the exercise of this function, MINEPDED will collaborate with Focal Points of key technical Ministries of the production sector and other Ministries carrying out activities that impact biodiversity. To ensure this the National Biodiversity Committee, identified as a priority within this document, will be put in place and made operational to ensure the effective coordination and monitoring of progress on implementation.

At decentralized levels, Biodiversity Focal Points will be set up within existing Regional Structuresto coordinate the implementation, monitoring and reporting on Biodiversity at regional and local council levels.

The participation of other actors at national and decentralized levels will include private sector, NGOs and local communities.

A series of implementation tools have been developed to ensure the effective implementation of this NBSAP and these include the following:

- A Communication, Education and Public Awareness Strategy for Biodiversity,
- A Capacity Building Strategy for Biodiversity,
- A Technology Needs Assessment for Biodiversity and,
- A Biodiversity Resource Mobilisation Plan

Measuring progress on the implementation plan will be based on the following indicators :

- Existence of the Implementation tools
- Existence of Guidelines for Monitoring and Evaluation
- Existence of Reporting Guidelines
- Number of Trainings on Monitoring and Reporting at National and Regional levels
- Number of Persons Trained on Reporting
- Number of Monitoring and Evaluation Reports

6.2 MONITORING AND EVALUATION

M & E mechanisms should be put in place at national, regional and community levels early in the implementation of the strategy and action plan. To this effect, all national and regional institutions must integrate M & E mechanisms as part of their plans and programmes for the implementation of the NBSAP. M & E mechanisms should be included in the Regional programmes of MINEPDED, MINFOF, MINADER, MINEPIA/SODEPA, MINRESI/IRAD, Development Authorities, etc.

One of the activities of the National Biodiversity Committee could include the coordination and and follow-up of the M & E of the NBSAP process – the Regional Committees on the Environment (RCE) would carry out the same functions at the Regional levels.

Awareness creation and capacity building efforts must be strengthened in order to carry out the M & E at all levels. The Local Communities should be provided with the necessary support in order to effectively get them involved in the M & E process.

Substantial budget is required to carry out the M & E process. Technical guidelines and monitoring methodologies must be formulated to assess the performance of NBSAP at the National, Regional and Local Community levels. The Essential elements /components of an effective Biodiversity Monitoring and Evaluation system adopted in the previous version are maintained and include;

1. Provide baseline data on changes occurring in the ecosystems.
2. Present results of monitoring in a form readily available and understandable to decision makers, interest groups, all including in particular the scientific communities.
3. Provide as accurate as possible timely information on population size, trends and dynamics especially of threatened species
4. Monitor the impact of implementation of activities, policies and laws related to the plan vis-à-vis conservation, sustainability and equity. .
5. Shifts in selected social, political and economic factors.
6. Trends in the monetary and non –monetary values of biodiversity and current expenditures and investments.

6.3 CRITERIA, INDICATORS AND VERIFIERS

The M and E process will utilise a coordinated approach in its activities and as much as possible standard methods based on active cooperation and partnership among ministries, universities, research institutions, NGOs, Local and international research communities, economic interest groups and all stakeholders in implementing the action plan.

Table 6.1 -6.4 below highlights the defined Biodiversity Strategic Goals and Targets. The priority Actions have been translated into performance criteria with verifiable indicators to evaluate levels of implementation of the prescribed actions.

6.4 REPORTING

Reporting on the progress of the implementation of the NBSAP will be periodic and will ensure the generation of timely information for integration in national and relevant international processes.

At the National level, reporting on Biodiversity will be carried out within the Budget Program progress. The National Budget which runs every three years calls for reporting at the end of each term. Biodiversity is a major program of the Sub-Sector Strategy for MINEPDED. The Biodiversity report will be prepared in 2015, 2018 and 2021.

The Biodiversity Report for the Sub Sector Strategy of MINEPDED will generate useful information for integration into Cameroon's National Report to the CBD. In a regular manner, Cameroon has submitted four-yearly reports to the CBD with NR1 in 1998, NR2 in 2002, NR3 in 2006 and NR4 in 2009. The 5th NR is underway to be submitted in 2014. A 6th Reports will therefore be prepared for 2018 and will constitute a first assessment of the implementation of the current NBSAP. A 7th Report will be prepared in 2021 and submitted in 2022 or as shall be determined by the Conference of Parties of the CBD.

The 2018 Report both for MINEPDED and the CBD will constitute a mid term evaluation on the extent to which the present NBSAP has been effectively implemented. The objective shall be to determine areas that require strengthening for an effective implementation
The 2021/2 Report shall constitute an end of term assessment of the present NBSAP. The objective shall be to determine areas that require strengthening and gaps for a revision of the present document.

TABLE 6.1: CRITERION, INDICATORS AND VERIFIERS FOR MONITORING PRIORITIES UNDER STRATEGIC GOAL A

ADDRESS THE UNDERLYING CAUSES OF BIODIVERSITY DEGRADATION AND LOSS BY REDUCING THE DIRECT AND INDIRECT PRESSURES ON BIODIVERSITY

Target/Criterion/Indicator	Verifiers	Implementation institutions	Periodicity or milestones of measurement
TARGET 1: AT LEAST 80% OF THE POPULATION IS AWARE OF THE IMPORTANCE OF BIODIVERSITY WITH AN INCREASED KNOWLEDGE ON THE LINK AND IMPACT OF HUMAN ACTIVITIES ON THE MAJOR ECOSYSTEMS			
Criterion 1-1 **Communication, Education and Public Awareness (CEPA) strategy for Biodiversity have been developed and implemented**			
Indicator 1-1-1 Biodiversity CEPA strategy document developed;	• radio and televisionprogramson biodiversity; • Publicationsarticles onbiodiversityin newspapers; • Postinformation aboutbiodiversity onsiteMINEPDED.	MINEPDED MINCOM MINESUP MINESEC	Weekly
Indicator 1-1-2 Nature and number of Biodiversity CEPA tools developed	• Reportsensitization • Presence ofposters and leafletsonthe importance ofprotecting biodiversity		
Criterion1.2 **the CEPA strategy on Biodiversity into the curricula of all levels of education has been mainstreamed**			
Indicator 1-2-1 Number of schools with incorporated elements of biodiversity conservation in curricula.	• Approved curricula for primary, secondary and tertiary levels. • . Approved list of textbooks	MINEPDED MINEDUC MINESEC MINESUP	By 2016
Indicator 1-2-2 Number of School Programs on biodiversity	• Reports of School clubs/associations		
Criterion 1.3 **Specific programs targeted at increasing private sector awareness and securing corporate investments in biodiversity have been developed**			
Indicator 1-3-1 An established Private Sector Engagement Program	• Document	MINEPDED MINCOMMERCE	By 2016
Indicator 1-3-2 Number of Biodiversity supported initiatives by the Private Sector	• Investment Budget of corporate bodies, • Internal Regulations of Corporate bodies, • Reports on activities of the private sector on the protection of biodiversity		
Criterion 1.4 The effective stakeholder participation in the stewardship of the biodiversity in all sectors has been promoted and encouraged			
Indicator 1-4-1 Institutional Map of Biodiversity Stakeholders	• Decisionon the establishmentof an interministerial committeeon the protectionof biodiversity	MINEPDED MINCOMMERCE MINFOF	Weekly

TARGET 2:BY 2020 SIGNIFICANT INCREASE IN THE CONTRIBUTION OF SCIENTIFIC BASED INFORMATION INTO BIODIVERSITY DECISION MAKING PROCESSES AND MANAGEMENT INTERVENTION			
Criterion 2.1 Biodiversity targeted and relevant research have been facilitated			
Indicator 2-1-1 An established Biodiversity priority needs for research;	• Document	MINEPDED, MINFOF, MINRESI,MINESUP	Continuous
Indicator 2-1-2 Number of scientific publications with key findings on biodiversity issues	• Scientific journalson biodiversity • Biodiversity related publications		
Criterion 2.2 Taxonomic knowledge and use of geo-referenced data in biodiversity planning have been improved			
Indicator 2-2-1 number of persons/institutions carrying out inventory to improve taxonomic knowledge;	• Report of inventory • Report of workshops on taxonomic knowledge	MINEPDED MINRESI	Continuous
Indicator 2-2-2 Number of institutions using Geo-referenced data in biodiversity planning;	• Publication ofscientific articles andforums; • Project Reports		
Criterion 2.3 A National Red Data Book for flora and fauna has been established and is accessible to users			
Indicator 2-3-1 A published National Red Data Book for both flora and fauna;	• National Report	MINEPDED	Continuous
Indicator 2-3-2 Number of institutions/persons using NRB (i.e. visiting websites and central portal for biodiversity information, etc.)	• Repertoireof the portal • Project Reports		
Criterion 2.4 A Science-Policy Biodiversity and Ecosystem (SPBES) Platform for the generation and dissemination of viable biodiversity science information targeted at decision makers and managers has been established.			
Indicator 2-4-1 An operational National SPBES Plateform;	• Decision • Reports of Plateform • Ppublications, articles,newsletters and newspapers	MINEPDED	
Indicator 2-4-2 Number of research projects on ecosystem and species-specific biodiversity issues carried out	• Project Report		
Indicator 2-4-3 Number of information tools produced by SPBES platform	• Articles • Newsletters, Early Warning Bulletins Published • Reports ofNGOs		
Indicator 2-4-4 Number of institutions/persons using tools for biodiversity decision making and management	• Website • Reports ofNGOs • Forum Reports • Project reports		
Criterion 2.5 The existing central information portal on biodiversity to facilitate more informed decision-making has been maintained and made fully accessible			
Indicator 2-5-1 The existing central information portal on biodiversity is fully operational, accessible and informs decision-making.	• Repertoire of Portal	MINEPDED	
Indicator 2-5-2 Number and type of information uploaded on the biodiversity central portal;	• Numberofvisitors		

Indicator 2-5-3 Number of downloads per week/month/year;	• Numberofvisitors		
TARGET 3 : BY 2020, ALL FORMS OF POLLUTION FROM WATER AND LAND-BASED ACTIVITIES HAVE BEEN BROUGHT TO LEVELS THAT ARE NON-DETRIMENTAL TO ECOSYSTEM FUNCTIONS			
Criterion 3.1 Carry out environmental impact assessment on all projects to reflect state of biodiversity based on no-net-loss, as well as design and implement mitigation measures.			
Indicator 3.1.1 Number of EIAs carried out for development projects that reflect state of biodiversity (based on "no-net-loss") by project promoters;	• Report Interministerial committee for Environment • EIA Reports	MINEPDED (Interministrial committee for Environment) Private Sector	
Indicator 3.1.2 Number of EMP implemented in an effective and efficient manner annually;	• Corporate Environmental Monitoring reports • Inspection Reports • Sanction Reports		
Criterion 3.2 Intensify the monitoring and control of the use and management of chemical pollutants in compliance with defined norms			
Indicator 3.2.1 Number of inspections/controls and Offense Statements (PVI and PVCI) established;	• Inspection/control Reports • Sanction Report	MINEPDED	
Criterion 3.3 Establish and ensure the implementation of waste management plans			
Indicator 3.3.1 Number of decentralised local authorities (CTD) and other institutions with approved functional Waste Management plans;	• Decisions/Internal Regulations of Corporate entities • Inspection Reports • Corporate Environmental Monitoring Reports	MINEPDED Local Authorities Private Sector NGOs	
Indicator 3.3.2 Quantity of waste collected, treated and/or recycled annually;	• Inspection reports • Corporate Environmental Monitoring Reports		
Criterion 3.4 Establish and ensure the implementation of approved waste management plans in extractive and construction industry, small holder and agro-industrial plantations.			
Indicator 3.4.1 Number of approved functional Waste Management plans implemented in a satisfactory manner in industries	• Inspection Reports • Corporate Environmental Monitoring Reports • Sanction Reports	MINEPDED Private Sector	
Criterion 3.5 Draw up an Inspection program for existing waste treatment plants in the country and ensure their effective rehabilitation and use.			
Indicator 3.5.1 Number of treatment facilities controlled, rehabilitated and functional	• Annual Inspection/Control Schedule • Environmental Monitoring Reports	MINEPDED Private Sector	
TARGET 4: BY 2020 AN ECOLOGICALLY SUSTAINABLE SYSTEM OF PRODUCTION AND CONSUMPTION IS ESTABLISHED BASED ON SUSTAINABLE PRACTICES WITH APPROPRIATE INVESTMENTS.			
Criterion 4.1. Promote and support the alternative consumption of new species and diversify varieties for commercialization			
Indicator 4.1.1 Number of new species promoted, supported and consumed;	• Scientific Publications • Project Reports	MINEPDED MINADER MINFOF MINEPIA Research Institutions NGOs	
Indicator 4.1.1 Number of diversified varieties commercialized;	• Scientific Publications • Project Reports		
Criterion 4.2: Promote and support sustainable Small and medium size Enterprises using production methods with less pressure on specific species			
Indicaror 4.2.1 Number of SME applying sustainable production methods based on developed	• Scientific publications, forums • Certificates	MINIMDT MINFOF	

standards;		NGOs	
Criterion 4.3: Identify and Promote the use of alternative energy options favourable to ecosystems			
Indicator 4.3.1 Type of alternative energy promoted;	• Reports of survey	MINEPDED MINEE Local authorities NGOs	
Indicator 4.3.2 Number of persons using alternative energy;	• Report of Survey		
Criterion 4.4: Promote the sustainable management of production landscapes in key development sectors			
Indicator 4.4.1 Certification schemes for selected products put in place;	• Decisions	MINEPDED MINFOF MINIMIDT NGOs	
Indicartor 4.4.2 Quantity of certified products commercialized;	• Certificates • Reports • Publications		
TARGET 5: BY 2020 BIODIVERSITY-RELATED LAWS AND REGULATIONS ARE STRENGTHENED AND MADE COHERENT IN ORDER TO AVOID CONFLICTING USES AND COMBAT ILLEGAL PRACTICES			
Criterion 5.1 Capacity built and compliance with Biodiversity related Multilateral Agreements			
Indicator 5.1.1 Number of Capacity Building Programs on Biodiversity MEAs developed and implemented	• Report of validation and training workshops •	MINEPDED; MINFOF; MINADER;	Continuous
Indicator 5.1.2 Adhesion Instrument ABS Protocol	• Letter of the Depositary Authority	MINEPDED	Continuous
Indicator 5.1.3 Adhesion Instrument Supplementary Protocol for Redress in the event of damage from the movement of living modified organisms	• Letter of the Depositary Authority	MINEPDED	Continuous
Indicator 5-1-4 Number of MEAS implemented in synergy with CBD	• Reports of meeting • Reports of activities implemented in synergy	MINEPDED, MINFOF	Continuous
Indicator 5-1.5 Proportion of national biodiversity legal instruments with inconsistencies vis-à-vis international biodiversity-related instruments	• Assessment reports • Volume of complaint	MINEPDED, MINFOF	Continuous
Criterion 5.2 Sector policy and laws are coherent with biodiversity policy, laws and regulations are revised and enforced			
Indicator 5.2.1 Level of involvement of the Administration in charge of Biodiversity and sector specific issues in the revision process	• Presence sheets • Partnership agreements • Contributions of the administration	MINEPDED, MINADER, MINFOF, MINEPIA	Continuous
Indicator 5.2.2 Number of referrals (provisions) of legal instruments related to biodiversity issues	• Legal text (laws and regulations)and strategy documents	MINEPDED	
Indicator 5.2.3 Number of Sector laws revised that address biodiversity issues	• Legal text • Report of meeting	MINEPDED	
Indicator 5.2.4 Level of implementation of legality framework for exploitation of resources	• Evaluation Report •		

Indicator 5.2.5 Level of National compliance with 4 objectives of PAPECALF on wildlife enforcement	• Evaluation Report • Activity Reports		
Criterion 5.3 Effective implementation of Land use plans and reduced conflicting uses			
Indicator 5.3.1 Land Use Plan	• Text		
Indicator 5.3.2 Number of conflicts registered between different actors	• Quantity of request submitted or settled • Judgments	MINEPDED, MINADER, MINFOF, MINEPIA	
Indicator 5-3-3 number and type of actors involved in land-use planning	• Report of planification of land-use	MINDCAF	
Criterion 5.4 Conflicting policies and laws related to Biodiversity are revised for coherence			
Indicator 5.4.1 Number of revised Sector laws with provisions related to Biodiversity and conflict prevention or settlement	• Text of Revised laws.	MINEPDED	

TABLE 6.2: CRITERION, INDICATORS AND VERIFIERS FOR MONITORING PRIORITIES UNDER STRATEGIC GOAL B

MAINTAIN AND IMPROVE THE STATUS OF BIODIVERSITY BY SAFEGUARDING ECOSYSTEMS, HABITATS, AND SPECIES AND GENETIC DIVERSITY

Target/Criterion/Indicator	Verifiers	Implementation institutions	Time frame
TARGET 6 : RATE OF DEGRADATION AND FRAGMENTATION OF ECOSYSTEMS AND THE LOSS IN HABITATS IS SIGNIFICANTLY REDUCED AT LEAST BY HALF			
Criterion 6-1 **Biodiversity assessments/inventories of natural habitats of forests including mangroves, wetlands, riparian areas around river banks, lake shores, and un-protected biodiversity hotspots have been conducted**			
Indicator 6-1-1 Number of persons/Institutions carrying out inventories and biodiversity assessment of natural habitats	• Reportsof inventory and assessments;	MINEPDED MINFOF	Yearly
Indicator 6-1-2 Biodiversity updates and alerts	• Biodiversity Assessment Reports • Biodiversity National Reports • Early Warning bulletins • Project Management Reports • Centralized Data Bank		
Criterion 6.2 Management plans for natural habitats under protection has been developed and implemented			
Indicator 6-2-1 Number of management plans developed for protected areas	• Management Plan forProtected Areas	MINEPDED, MINFOF, MINREST, NGOs, etc.	Yearly
Indicator 6-2-2 Number of natural habitats under protection with functional management plans	• Management Plans		
Indicator 6-2-3 Total Surface area under protected management	• Management Plan • Decision creating protected area		

	• Report of Technical Ministry		
TARGET 7: ENDEMIC AND THREATENED SPECIES OF FLORA AND FAUNA SHOULD BE SUSTAINABLY MANAGED			
Criterion 7.1Establish and implement the strategy/program for the control and prevention of biological invaders (invasive alien species, living modified organisms)			
Indicator 7-1-1 A National strategy to monitor and control biological invaders operationalized	• Strategy Paper	MINEPDED	
Indicator 7-1-2 Number and type of authorized LMOs under control	• StudyReport		
Indicator 7-1-3 Surface area occupied by invasive alien species monitored and controlled	• Monitoring Reports		
Criterion 7.2A programme/project for the management of threatened and endangered species has been established and implemented			
Indicator 7-2-1 Number of operational projects put in place to manage endemic and threatened species;	• Projects Reports	MINEPDED	
Indicator 7-2-2- Rate of population growth of species	• Survey reports		
Criterion 7.3 Decentralised local authority management programs for threatened and endangered species have been established and implemented.			
Indicator 7-3-1 Number of Pilot Decentralised local authorities with participatory management programs for threatened and endangered species	• Reports	MINEPDED	
Indicator 7-3-2 Rate of population growth of species	• Survey reports in pilot zone		
Criterion 7.4 Decentralised local authority management programs to fight biological invaders and Invasive Alien Species have been established and implemented			
Indicator 7-4-1 Number of Decentralised Local Authorities with management plans to fight biological invaders and invasive alien species;	• Disappearance of these species in the affected communities	MINEPDED	
Indicator 7-4-2 Surface area under monitoring and control	• Increase inpopulation		
TARGET 8: LOCAL EXTINCT SPECIES IN-SITU AND EX-SITU RECOVER AND MAINTAIN A LEVEL OF CONSERVATION THAT ENSURES LONG TERM SUSTAINABILITY			
Criterion 8.1: Implement species conservation and recovery programs, both at in-situ and ex-situ levels have been implemented.			
Indicator 8-1-1 Number of Functional arboreta, zoos developed for key ecosystems	• Decision • Annual Reports	MINEPDED	
Indicator 8-1-2 Number of species re-established and/or recovered	• Reportof inventory/survey		
Criterion 8.2PAs for ex-situ conservation have been used and existing green corridors around Pas have been created and/or extended.			
Indicator 8-2-1 Number of gene banks established for threatened species	• Survey Report • Publications	MINFOF	
Indicator 8-2-2- Number/surface area of green corridors created around PAs	• Decision • Reports		

TARGET 9: DEGRADED ECOSYSTEMS/HABITATS ARE REHABILITATED AND MAINTAIN A LEVEL OF CONSERVATION THAT ENSURES LONG-TERM SUSTAINABILITY.			
Criterion 9.1 Rehabilitation programs for degraded ecosystems/habitats have been developed and implemented			
Indicator 9-1-1 Surface area of degraded ecosystem/habitats restored;	• Survey Report • Project Reports	MINEPDED MINFOF NGOS	Yearly
Indicator 9-1-2 Annual rate of restoration of lost species	• Survey Report • Project Reports • Publications		
Criterion 9.2 Ecosystem specific rehabilitation programs for degraded ecosystems/habitats have been developed and implemented			
Indicator 9-2-1 Surface area of specific ecosystem/habitat rehabilitated	• Survey Report • Project Reports • Publications	MINEPDED MINFOF NGOS	Continuous
Indicator 9-2-2 Annual rate of restoration of lost species per specific ecosystem	• Survey Report • Project Reports • Publications		
TARGET 10: NEGATIVE IMPACTS OF CLIMATE CHANGE AND CLIMATE VARIATION ON ECOSYSTEMS AND HUMAN WELL-BEING ARE SIGNIFICANTLY REDUCED THROUGH ECOSYSTEM-BASED CLIMATE CHANGE ADAPTATION MEASURES			
Criterion 10.1 Good ecosystem-based lessons-learnt on climate change adaptation and mitigation projects have been identified and replicated			
Indicator 10-1-1 Number of CC mitigation and adaptation projects efficiently and effectively implemented in vulnerable ecosystems.	• Reportproject implementation	MINEPDED	
Criterion 10.2 The National Observatory on Climate Change is operational			
Indicator 10-2-1 Texts of application and designation of personnel of the National Observatory on CC	• Decision designating personnel • Periodic activity reports	MINEPDED	
Indicator 10-2-2 CC Fact sheets published regularly	• Reports, • publications, articles,newsletters and newspapers		
Criterion 10.3 Freshwater quality norms for human consumption and biodiversity survival based on climate change and variation have been established and implemented			
Indicator 10-3-1 Number of standards/guidelines developed	• Documents	MINEPDED	
Indicator 10-3-2 Number of institutions in compliance with standards/guideline	• Mission reportsofinspection/control • Monitoring Report of PGE • Number of PVI/ PVCI		
TARGET 11: AT LEAST 30% OF THE NATIONAL TERRITORY IS UNDER EFFECTIVELY AND EQUITABLY MANAGED PROTECTED AREAS			
Criterion 11.1 Programs for the restoration of degraded Pas have been established and implemented and PA biodiversity has been valorized			
Indicator 11.1.1 Number of programs for restoration of degraded PAs	• Project Reports	MINEPDED, MINFOF, NGOs	Continuous
Indicator 11-1-2 % increase in number/surface of protected areas per category	• Decision • Publications		
Indicator 11-1-3	• Management Plans		

% of PAs under effective management plans			
Indicator 11-1-4 Number of biodiversity species valorized	• Project Reports		
Criterion 11.2 PA's in fragile ecosystems and biodiversity hotspots in marine and semi-arid ecosystems have been established			
Indicator 11-2-1 Number & proportion of PAs in marine and semi-arid ecosystems	• Decision	MINFOF, MINEPDED, NGOs	By 2018
Criterion 11.3 More PAs to be nominated as UNESCO Biosphere Reserves (BRs) are proposed			
Indicator 11-3-1 Number & proportion of PAs as biospheres reserves	Decisions	MINFOF, MINEPDED, NGOs	Continuous
Criterion 11.4 An Access and Benefit Sharing scheme for national protected areas have been developed and implemented.			
Indicator 11-4-1 An ABS scheme for PA developed	• Document	MINFOF, MINEPDED, NGOs	
Indicator 11-4-2 Number of ABS capacity building workshops	• Report of workshops • Attendance List • Module for capacity building		
Indicator 11-4-3 Nature and amount of benefit from PA Revenue shared with local/riparian communities	• Survey • Report		
TARGET 12: GENETIC DIVERSITY OF CULTIVATED PLANTS, DOMESTICATED ANIMALS, AND THEIR THREATENED WILD RELATIVES INCLUDING CULTURALLY VALUABLE SPECIES, ARE MAINTAINED AND VALORISED.			
Criterion 12.1 Inventory of threatened genetic species of crops and livestock including their wild relatives, NTFPs, and species with potentials for commercialization have been established			
Indicator 12-1-1 Number of threatened genetic species established in the inventory;	• Report of inventory	MINFOF, NGOs, Univerties	Continuous
Criterion 12.2 Management plans for threatened genetic diversity of cultivated plants, domesticated animals, and their wild relatives have been developed and implemented			
Indicator 12-2-1 Number of Management Plans implemented;	• Report of projects implemented	MINFOF, NGOs, Univerties	Continuous
Indicator 12-2-2 Number of threatened genetic species maintained and valorised	• Reports		
Criterion 12.3 The valorisation of genetic species with potentials for commercialisation and cultivation of threatened marketable genetic species have been promoted.			
Indicator 12-3-1 Number of genetic species with potentials for commercialization valorised	• Study Report • Publications	MINEPDED, MINFOF, ONGs	
Indicator 12-3-2 Number of threatened marketable genetic species cultivated	• Survey Report • Project Reports • Publications		
TARGET 13: COMMUNITY-BASED BIODIVERSITY CONSERVATION AND ECOSYSTEM MANAGEMENT APPROACHES IN PLACE			
Criterion 13.1 The creation of more community-based biodiversity conservation forests have been promoted and biodiversity conservation activities in both newly created and existing ones have been incorporated			
Indicator 13-1-1 Number of Community- forests created	• Decision	MINFOF, NGOs	Continuous

Indicator 13-1-2 Number of Community-forests in which biodiversity conservation has been incorporated	• Management Plan • Survey		
Indicator 13-1-3 Guidelines for incorporation of biodiversity conservation and ecosystem management in Community forests	• Guideline document		
Criterion13.2 The establishment and sustainable use of sacred forests as community entities have been promoted and biodiversity conservation activities in the management plans of these forests have been incorporated			
Indicator 13-2-1 Number/surface area of sacred forests established	• Decision • Survey	MINFOF, NGOs	Continuous
Indicator 13-2-2 Number of sacred forests with management plans that incorporate biodiversity conservation and ecosystem management approaches	• Management Plans • Report of projects implemented •		
Indicator 13-2-3 Biodiversity species assessed in sacred forest with cultural and spiritual values for conservation	• Report of inventory • Report of study		
Target 14 A comprehensive program for the economic valuation of biodiversity is realized and payments for ecosystem services and goods is imputed into the National Budget and used in promoting sustainable biological and genetic resources.			
Criterion 14-1 **A study on Economic Valuation of Biodiversity and Payment of Ecosystem Services (PES) and Development of Tools for their integration in the national accounting system is realized.** 14.1.4 In-depth study of economic value of biodiversity and ecosystem services. Type of Economic tools for quantification and integration of the value of biodiversity resources and ecosystem services in national accounts;			
Indicator 14.1.1 In-depth study of economic value of biodiversity and ecosystem services.	• Report of study		
Indicator 14.1.2 Mapping and assessment of the state of biodiversity resources, ecosystems and their services for National Economic accounting and reporting purposes	• Survey Report		
Indicator 14-1-3 Type of Economic tools for quantification and integration of the value of biodiversity resources and ecosystem services in national accounts;	• National accounts; • Reports • National biodiversity report		
Criterion 14.2 Building of Capacity on use of tools for biodiversity and ecosystem services national accounting			
Indicator 14-2-1 Number of capacity building workshops carried out	• Workshop reports, • National NBSAP implementation report		
Indicator 14-2-2 Number of persons trained on use of economic tools	• Workshop reports • Survey		
Indicator 14-2-3 Proportion of GDP from Biodiversity Resources and Ecosystem Services	• Study Report • BIP		
TARGET 15 MECHANISMS FOR PAYMENT OF ECOSYSTEM SERVICES, INCLUDING CARBON STOCKS ESTABLISHED AND IMPLEMENTED			
Criterion 15-1 Assessment and evaluation of carbon stocks in all ecosystems carried out			
Indicator 15-1-1 Estimated quantity of Carbon stocks per ecosystem (in tons of CO_2 equivalent)	• Survey		

	• Periodic activity reports		
Criterion 15-2 Compensation mechanisms that provide benefit from efforts made within the conservation framework in ecosystems (REDD+).			
Indicator 15-2-1 REDD+ Strategy and Action Plan Adopted and implemented	• Document • REDD+ National Reports		
Indicator 15-2-2 Total revenue generated from the sale of Carbon stocks	• Survey • Periodic activity reports; • Documents		
Criterion 15.3 Corporate and private sector initiatives with voluntary payments for biodiversity and other PES schemes			
Indicator 15.3-1 Mechanism for corporate & private sector Payment of use of Biodiversity and ecosystem service established;	• Corporate Reports • Survey		
Indicator 15-3-2 Total revenue generated from payments for biodiversity and Ecosystem Services schemes by Corporate and Private sector initiatives;	• Survey • Periodic activity reports; • Corporate financial report • Documents		
TARGET 16: BY 2020, THE SHARING OF BENEFITS FROM PAYMENTS FOR THE SUSTAINABLE UTILISATION OF BIODIVERSITY, GENETIC RESOURCES AND ASSOCIATED TRADITIONAL KNOWLEDGE SHOULD INCREASE INCOMES OF LOCAL COMMUNITIES.			
Criterion 16.1 Complete the putting in place of the legal, institutional and regulatory instruments for ABS			
Indicator 16.1.1 Adhesion to the ABS Protocol	• Adhesion instrument,		
Indicator 16-1-2 Existing ABS Legislation and regulatory instruments	• Texts		
Indicator 16-1-3 Designated competent national authorities for ABS	• Text designating ABS Competent National Authorities		
Indicator 16-1-4 Level of enforcement of the ABS legislation	• Periodic activity reports • Assessment Report		
Criterion 16.2 The implementation of ABS frameworks for payments for commercial and non-commercial research in protected areas			
Indicator 16.2.1 Amount of Annual revenue and other	• Reports • PA Activity Reports		
Indicator 16.2.2 Nature of benefits generated from payment of ABS activities (commercial and non-commercial research in protected areas)	• Survey • Reports		
Indicator 16.2.3 Amount of Annual Revenue generated from ABS activities	• PA Activity Reports • Reports		
Indicator 16.2.4 Proportion of revenue/benefits paid to beneficial local/riparian communities;	• survey		
Criterion 16.3 Develop and Implement Capacity building program for ABS Regime.			
Indicator 16-3-1 Capacity building program on ABS developed	• Document		

Indicator 16-3-2 Number and type of tools for ABS Capacity building	• document		
Indicator 16-3-3 Number and type of capacity building workshops	• Workshop Reports • Evaluation Reports		
Indicator 16-3-4 Number and category of persons trained on ABS;	• List of Participants		
Indicator 16-3-5 Number of ABS agreements signed	• Agreements • Reports		
Criterion 16-4 Carryout a Pilot Initiative for the Protection and valorization of traditional knowledge associated with biological and genetic resources,			
Indicator 16-4-1 Study on the protection and valorization of TK;	• Report of Study		
Indicator 16-4-2 Pilot Protection of Traditional knowledge	• Project Report • Survey • Activity Report		
Criterion 16.5 Establish programmes/projects that enhance Access and Benefit Sharing, to ensure that stakeholders adequately gain from biodiversity conservation action.			
Indicator 16.5.1 Number of ABS projects;	• Project Reports • Survey		
Indicator 16-5-2 Number and type of genetic or biological resources under ABS regimes;	• Project Reports • Survey		
Indicator 16-5-3 Nature and amount of benefit generated;	• Survey • Reports		
Indicator 16-5-4 Number and category of beneficiaries	• Survey • Reports		
Criterion 16.6 Establish community and national networks for ABS			
Indicator 16-6-1 Nature and number of ABS networks	• Network Reports • Project Reports • Survey		
TARGET 17: BY 2020, BIODIVERSITY RELATED COORDINATION MECHANISMS SHOULD BE FULLY FUNCTIONAL AND STRENGTHENED			
Criterion 17.1 National Biodiversity Coordination Committee (NBCC) and Sector/local/regional units operational			
Indicator 17.1.1 National Biodiversity Coordination Committee is functional	• Buildings • staff • Meetings reports	MINEPDED; MINFI Sector Representatives CSO	
Indicator 17.1.2 Sector and Regional Focal Points are designated	• Decision of designation	MINEPDED; MINFOF MINADER; MINEPIA	
Indicator 17.1.3 National, sector and regional reports validated	• Reports	MINEPDED; MINFI Sector Representatives CSO	

Indicator 17.1.4 NBCC sessions hold annually	• Report of meeting • Report of activities	MINEPDED	
Criterion 17.2 Bureaux set up and staff designated for relevant National organs			
Indicator 17.2.1 Number of unctional coordination bodies set up to handle biodiversity issues	• Decision creating and organising organs • Report of activities	MINEPDED	periodical
Indicator 17.2.2 number and type of personnel	• Act of recruitment • Qualifications of personnel • Area of training	MINEPDED	Continuous
Indicator 17-2-3 amount of budget and logistics allocated to each National Organ	• Budget documents	PM OFFICE MINEPAT MINFI	
Criterion 17.3 Functioning of the National Fund for Environment and Sustainable Development is strengthened			
Indicator 17-1-1 Accountant appointed	• Act of appointment by Minister of Finance • Financial report	MINFI	
Indicator 17-1-2 Amount of State Subsidies disbursed for biodiversity issues	• Finance law • Financial report	MINFI	
TARGET 18: By 2020 KEY PRODUCTION SECTORS AND DECENTRALISED LOCAL AUTHORITIES SHOULD HAVE DEVELOPED SECTOR OR REGION SPECIFIC BIODIVERSITY TARGETS LINKED TO THE NATIONAL TARGETS			
Criterion 18.1 Development and implementation of sector specific biodiversity targets with action plans by key production ministries			
Indicator 18.1.1 Guidelines for mainstreaming Biodiversity in Production Sectors	• Report of Meetings • Validated Document	MINEPDED	
Indicator 18.1.2 level of mainstreaming of NBSAP in sector specific strategy document	• National Strategy document • Sector Strategy documents	MINEPDED, MINFOF, MINADER, MINRESI MINEPIA, MINFI, MINEE; MINCOMMERCE, MINTOUR; IRAD, MINMIDT;	
Indicator 18.1.3 Number of Sector ministries endowed with defined Biodiversity targets;	• Report of meeting • Sector Programs and projects implementation • documents and reports	MINEPDED, MINFOF, MINADER, MINRESI MINEPIA, MINFI, MINEE; MINCOMMERCE, MINTOUR; IRAD, MINMIDT	
Indicator 18-1-4 Number of biodiversity programs and projects set up and implemented by each sector;	• Programs and projects documents • Report of meeting • Report of programs and projects implementation • Reports of activities	MINEPDED MINFOF, MINADER, MINRESI MINEPIA, MINFI, MINEE; MINCOMMERCE, MINTOUR; IRAD,	

		MINMIDT	
Indicator 18-1-5 Number of biodiversity programs and projects carried out by MINEPDED in partnership with Sector Ministerial Departments.	• Partnerships agreements • Report of meeting • Report of activities produced by MINEPDED	MINEPDED EACH SECTOR MINISTERIAL DEPARTMENTS Development Partners	
Criterion 18.2 Development and implementation of pilot programs for biodiversity mainstreaming in decentralised local plans			
Indicator 18.2.1 Guidelines for mainstreaming Biodiversity in decentralized and local Council Plans	• Report of meetings • Validated Document	MINEPDED MINATD; FEICOM	
Indicator 18-2-2 Number of Regions/Local councils endowed with Biodiversity targets and Action Plan	• Reports of validation meetings • Report of activities	MINEPDED REGIONS LOCAL COUNCILS	
Indicator 18-2-3 Number of biodiversity pilot programs and projects set up and implemented by Regions/Local councils	• Projects and programs documents • Report of meetings • Report of activities implemented by Regional/local council	MINEPDED MINATD FEICOM REGIONS LOCAL COUNCILS NGOs	
Indicator 18-2-4 Number of biodiversity programs and projects carried out by MINEPDED in partnership with Regions/ Local Councils	• Partnership agreements • Report of meeting • Report of activities produced by MINEPDED	MINEPDED MINATD FEICOM REGIONS LOCAL COUNCILS Development Partners NGOs	
Criterion 18.3 Supervisory authorities and key sectors Plan and Budget to facilitate mainstreaming of biodiversity in national and sector program budgets			
Indicator 18-3-1 Budget allocation for biodiversity programs and projects per Region/Local Council	• Regional/Local budget document • Regional/Local financial report of activities	PM OFFICE MINEPAT MINFI	
Indicator 18-3-2 Budget allocation for biodiversity in GESP	• GESP Financial document • Finance Law • Financial report	MINEPAT MINFI	
Indicator 18-3-3 Budget allocations for Biodiversity Projects and programs in sector PIB	• PIB financial document • Finance Law • Financial report of PIB sector	MINEPDED MINFI	

TARGET 19: BY 2020, THE CAPACITY OF KEY ACTORS SHOULD BE BUILT AND GENDER MAINSTREAMING CARRIED OUT FOR THE EFFECTIVE IMPLEMENTATION OF THE BIODIVERSITY TARGETS			
Criterion 19.1 Capacity Building program for key Biodiversity stakeholders is developed and implemented;			
Indicator 19-1-1 Number of biodiversity training modules elaborated and validated	• Report of validation workshop	MINEPDED	
Indicator 19-1-2 Number of biodiversity training workshops organized	• Report of training workshop	MINEPDED	
Indicator 19-1-3 Number of stakeholders trained	• Report of training workshop • Training diploma issued	MINEPDED	
Criterion 19.2 Tools for outreach on newly adopted Biodiversity Targets and Action Plan developed and in application			
Indicator 19-2-1 Number of Outreach tools developed;	• Quantity of document • templates	MINEPDED	
Indicator 19-2-2 Number of NBSAP dissemination workshops organized;	• Report of meetings • Report of workshops • Communications	MINEPDED	
Indicator 19-2-3 Number of beneficiaries/recipients	• Training diploma issued	MINEPDED	
Criterion 19.3 Training and scholarships to expand expertise on key aspects of biodiversity			
Indicator 19-3-1 Number of persons trained from diverse sectors	• Training diploma issued	MINEPDED	
Indicator 19-3-2 Number of workshops organized	• Report of meetings • Report of workshops	MINEPDED	
Indicator 19-3-3 number of beneficiaries from scholarships	• Report on scholarships distribution	MINEPDED	
Criterion 19.4 Study on linkages between biodiversity and gender			
Indicator 19-4-1 Report on gender/biodiversity Study	• Report • Contents of report	MINEPDED	
Criterion 19.5 Tools for Gender mainstreaming developed and in application			
Indicator 19-5-1 Number of Outreach tools developed	• Report on outreach tools • Report of validation workshop	MINEPDED	
Indicator 19-5-2 Number of biodiversity targets mainstreaming gender	• Report of sensitization campaigns • Report of validation workshop	MINEPDED	

Indicator 19-5-3 Number by gender category involved in Biodiversity projects and programs implementation	• Report of biodiversity project implementation	MINEPDED	
TARGET 20: BY 2020 PARTNERSHIP SUPPORT AND FUNDING OF BIODIVERSITY PROGRAMS SHOULD HAVE INCREASED			
Criterion 20.1 Partnership with regional, sub-regional and international Organizations, on biodiversity issues is strengthened			
Indicator 20-1-1 Number of partners involved in biodiversity issues	• Letters of partnership • Report of meeting	MINEPDED MINFOF MINADER MINEPIA	
Criterion 20-2 Partnership Conference on the NBSAP Organised			
Indicator 20-2-1 Level of Partner Commitments;	• Partners Statements • Partnerships	PM OFFICE STATES DONORS INTERNATIONAL ORGANISMS	
Criterion 20.3 implementation of a resource mobilization strategy and plan to increase funding for biodiversity			
Indicator 20-3-1 Amount of domestic financial support for Biodiversity per annum	• BIP	PM OFFICE MINEPAT MINFI	
Indicator 20-3-2 Amount of GEF funding for Biodiversity focal area	• GEF allocations	MINEPDED	
Indicator 20-3-3 Amount of other multilateral funding for Biodiversity	• Reports • Agreements	MINEPDED MINEPAT	
Indicator 20-3-4 Amount of bilateral funding for Biodiversity	• Reports • Agreements	MINEPDED MINEPAT	
Indicator 20-3-5 Amount of Private Sector investment in Biodiversity programs and projects	• Private sector body statement • Industries statements • Financial agreements	Private Sector/GICAM MINEPDED	
Indicator 20-3-6 Number of initiatives and amounts generated under innovative financing mechanisms to support biodiversity	• Reports	MINEPDED	

Indicator 20-3-7 Number of initiatives to heighten awareness on the need to increase or mobilie support for biodiversity	• Reports	MINEPDED	

TABLE 6.5 ECOSYSTEM SPECIFIC TARGETS

MARINE/COASTAL ECOSYSTEM

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E TARGET 1: EFFECTIVE CONTROL OF ALL SOURCES OF COASTAL AND MARINE POLLUTION AND THEIR IMPACTS ON THE ECOSYSTEM REDUCED			
Criterion E 1-1 Marine pollution control is intensified			
Indicator E-1-1-1 Number of effective collaboration protocols signed between MINEPDED and other stakeholders to monitor marine and coastal pollution	Signed MOUs Reports	MINEPDED, NGOs, Private Sector	Continuous
Indicator E 1-1-2 Level of pollution load in marine/coastal ecosystem	Periodic Activity report; Survey Report	MINEPDED, NGO, Private Sector,	Continuous
Indicator E 1-1-3 population trends of species in marine ecosystem	Inventory Reports Publications Project Reports	MINEPDED, Universities, Research Institutions NGO, Private Sector	Continuous
Criterion E 1.2 Control and Inspections of coastal and marine sector activities is strengthened			
Indicator E 1.2.1 nature and quantity of control equipment procured;	Reports	MINEPDED, NGO	Continuous
Indicator E 1-2-2 number of functional environmental control posts created in marine environment	Decision	MINEPDED	Continuous
Indicator E 1-2-3 Number of controls/inspections of pollution sources	Control reports	MINEPDED	Continuous
Criterion E 1.3 Community Based beach clean up programs are strengthened			
Indicator E 1.3.1 Budget allocated for Beach litter Clean-up activities	Project Report Financial Reports of Organisation	MINEPDED, MINEPAT	Continuous
Indicator E 1-3-2 number of capacity building/sensitization workshops to fight Marine/Coastal littering	Workshop Reports	MINEPDED, NGO	Continuous
Indicator E 1-3-3 number of persons and organizations involved in beach litter clean-up campaigns	Project Activity Reports	MINEPDED, NGO, CBO	Continuous
E – TARGET 2 SIGNIFICATION REDUCTION IN DEGRADATION AND LOSS OF MANGROVE FOREST AND ASSOCIATED COASTAL FOREST IS REALISED			
Criterion E 2-1: programs on Mangrove restoration are intensified inclufing training on the sustainable utilization of mangrove forest products			
Indicator E-2-1.1 Surface area (ha) of mangrove forests replanted and/or regenerated annually	Annual activity reports	MINEPDED, MINFOF	Continuous
Indicator E 2.1.2	Annual activity reports	MINEPDED, MINFOF	Continuous

number of tree nurseries established and plant population	Existing nurseries and tree populations in them	NGO	
Indicator E 2-1-3 Number of workshops	NBSAP National implementation report Annual activity reports	MINEPDED, NGO	Continuous
Indicator E 2-1-4 Surface area of mangrove forests under sustainable utilisation	NBSAP National implementation report Annual activity reports	MINEPDED, MINFOF	Continuous
Criterion E 2.2 More Programs for alternative use of energy in coastal and marine environment			
Indicator E 2-2-1 Number of projects promoting the use of alternative energy in the marine and coastal areas	NBSAP National implementation report Annual activity reports Existing projects	MINEPDED, MINEE, NGO, Councils in Coastal areas	Continuous
Indicator E 2-2-2 Number of improved ovens in use	Inventory report	MINEPDED, MINFOF, NGO	Continuous
Criterion E 2.3 Program to protect spawning grounds is put in place			
Indicator E.2.3.1 Surface area of spawning grounds regenerated and protected	NBSAP National implementation report Annual activity reports	MINEPDED, NGO	Continuous
E TARGET 3 EFFECTIVE REDUCTION OF COASTAL EROSION AND REHABILITATION OF ERODED COASTAL BEACHES			
Criterion E 3.1 Programs to reduce Coastal Erosion are developed and implemented			
Indicator E-3-1-1 More studies on coastal erosion carried out	Report of studies	MINEPDED, Research Institutions, Universities, NGO	Continuous
Indicator E 3-1-2 Established Baseline on coastal erosion	Baseline Report	MINEPDED, Research Institutions, Universities, NGO	Continuous
Indicator E 3-1-3 Number of projects set up to control coastal erosion	Existing projects, NBSAP National Implementation report		
Indicator E-3-1-4 Surface area of land protected and recovered from coastal erosion	Project Area Survey	MINEPDED	Continuous
Criterion E 3-2 Strengthen and support the use of local technology to rehabilate and manage all eroded coastal beaches			
Indicator E 3-2.1 surface area of eroded beaches rehabilitated annually through the use of local technology	Annual Activity reports	MINEPDED, NGO, Local Councils	Continuous
TROPICAL DENSE HUMID FOREST ECOSYSTEM **E TARGET 4 : LOCAL GOVERNANCE IS EFFECTIVELY ENHANCED THROUGH THE INTEGRATION OF ACTION FRAMEWORKS ON ALL ACTIVITIES (MINING, INDUSTRIAL LOGGING, SMALLHOLDER AGRICULTURE, AND ILLEGAL LOGGING) THAT IMPACT ON FOREST BIODIVERSITY CONSERVATION AND PROTECTED AREAS MANAGEMENT**			
Criterion 4.1 Coordinated and integrated approach in land use allocation within forest ecosytems			
Indicator 4.1.1	Annual activity report	MINEPAT, MINEPDED,	Continuous

Number of integrated approaches promoted		NGO	
Indicator 4.1.2 Number of established Multi-stakeholder Coordination structure (s) for land use allocation	Orders establishing such structures Annual activity report	MINEPAT, MINEPDED, NGO	Continuous
Indicator 4-1-3 Proportion of local communities' representatives in land-use allocation Structure (s)	Orders creating such structures Annual activity reports	MINEPDED, NGO, MINEPAT	Continuous
Indicator 4-1-4 number of Environmental and Social Management Plans approved and jointly monitored by all stakeholders	Annual activity reports	MINEPDED, NGO	Continuous
Indicator 4-1-5 Proportion of local population representatives in ESMP joint monitoring committees	Annual activity reports	MINEPDED, NGO	Continuous
Criterion 4.2 Forest Management Plans are effectively developed and managed			
Indicator 4.2.1 number of PAs with effective management plans that are integrated with biodiversity conservation programmes	Annual activity reports	MINEPDED, NGO	Continuous
Indicator 4.2.2 number of Forest Management Units with Forest Stewardship Certification	Annual activity reports	MINFOF, MINEPDED, NGO	Continuous
Criterion 4.3 Management plans for designated Protected Areas are functional and promote a National PA System that includes non-formal protected areas.			
Indicator 4-3-1 number of designated PA that are effectively implementing a holistic management plan involving a high participation from CBOs	Annual activity reports	MINFOF, MINEPDED, NGO	Continuous
Indicator 4-3-2 Percentage increase in cover quality and density of ecosystems and PAs			
Criterion E.4.4 Establish and ensure implementation of sustainable forest management systems in the informal forest sector			
Indicator E 4-4-1 Number of sustainable forest management systems established and implemented in the informal forest sector	Annual activity reports	MINFOF, MINEPDED, NGO	Continuous
TROPICAL WOODED SAVANNAH ECOSYSTEM **E TARGET 5-EFFECTIVE REDUCTION OF BUSHFIRE INCIDENCE**			
Criterion E.5.1 A special project to intensify control and minimise impacts of bushfires			
Indicator 5-1-1 Number of PAs/farming areas with buffer zones effectively created to protect them from bushfires and serve other purposes	Annual activity reports Survey	MINEPDED, MINFOF, MINADER,	Continuous
Indicator 5-1-2 Number of training/capacity building workshops organised for targeted local communities on management of strategic burning	Annual activity report Workshop Reports Survey	MINEPDED, MINFOF, MINADER,	Continuous
E TARGET 6: INCREASE USE OF ALTERNATIVE ENERGY WITH SIGNIFICANT REDUCTION OF PRESSURE ON FUEL WOOD ACHIEVED			
Criterion E.6.1 Promote the use of alternative energy adapted to tropical wooded savannah ecosystem			
Indicator E 6-1-1 Number of improved cooked stoves manufactured and distributed to vulnerable households	Annual Activity report	MINEPDED, MINEE, NGO, Local Councils	Continuous

Indicator E 6-1-2 number of biogas projects implemented	Annual Activity report survey	MINEPDED, MINEE, NGO, Local Councils	Continuous
Criterion E.6.2 Development of local technologies on alternative energy is promotied			
Indicator E 6.2.1 number of capacity building workshops organised for the promotion of local technologies on alternative energy	Annual Activity report Workshop reports	MINEPDED, MINEE, NGO, Local Councils	Continuous
Indicator E 6-2-2 number of local technologies identified and promoted	Annual Activity report Corporate report	MINEPDED, MINEE, NGO, Local Councils	Continuous
E TARGET 7 : TARGET POPULATIONS HAVE SUFFICIENT CAPACITIES TO REDUCE OVERGRAZING			
Criterion E.7.1 Develop and implement Capacity building programs for grazer communities to reduce overgrazing			
Indicator E-7-1-1 Number of capacity building/training organised for targeted local communities	Reports Workshop Reports survey	MINEPDED, MINEPIA, NGO	Continuous
Criterion E.7.2 Forage production by local grazier communities			
Indicator E -7-2-1 Surface area developed for improved forage production;	Project Reports Survey	MINEPDED, MINEPIA, NGO	Continuous
Indicator E-7-2.2 number of local graziers adopting the new technology	Survey Reports	MINEPDED, MINEPIA, NGO, Research Institutes	Continuous
MONTANE ECOSYSTEM **E TARGET 8: EFFECTIVE STRENGTHENING OF COMMUNITY-BASED BIODIVERSITY CONSERVATION AND MANAGEMENT INITIATIVES FOR ENDANGERED MONTANE SPECIES ACHIEVED.**			
Criterion E.8.1 Promote the establishment of Montane ecosystem community based management and incorporate management of endangered species and disasters in hotspots.			
Indicator E-8-1-1 Number of community based projects established in which management of montane endangered species are incorporated	Project reports	MINEPDED, NGO, Local Councils	Continuous
Indicator E 8-1-2 Population trends of endangered species in Montane ecosystem;	Studies, NBSAP National implementation report	MINEPDED, Universities, Research Institutes	Continuous
SEMI-ARID ZONE ECOSYSTEM **E TARGET 9: EFFECTIVE REHABILITATION OF DEGRADED SITES FROM DROUGHTS AND FLOODS**			
Criterion E.9.1 Intensify programs for the rehabilitation of drought and flood zones in the semi-arid ecosystem			
Indicator E - 9-1-1 surface area of degraded/flooded zones rehabilitated	Annual activity report	MINEPDED, NGO, Universities	Continuous
Indicator E-9-1-2 Number of improved cooking stoves distributed annually under the SAHEL Project	Annual activity report	MINEPDED	Continuous
E TARGET 10: FRESHWATER ECOSYSTEM **WETLANDS OF GREAT SIGNIFICANCE ARE UNDER MANAGEMENT PLANS ANDDEGRADED FRESH WATER CATCHMENT AREAS AND RIPARIAN ZONES EFFECTIVELY RESTORED AND PROTECTED**			

Criterion E.10.1 Establishment of National Water Resource Quality Management Plans which include flow allocations for the environment and ensuring in-stream barriers to movement of fauna are in place in the majority of catchments.			
Indicator E-10-1-1 National Water Resource Quality Management Plans	document	MINEE, CamWater, Universities, NGO	Continuous
Indicator E-10-1-2 Percentage area of river and groundwater systems for which environmental allocations have been substantially implemented for all systems identified in implementation programs	National Water resources report	MINEE, CamWater, Universities, NGO	Continuous
Indicator E 10-1-3 Percentage of waterways which conform to guidelines of the National Water Quality Management Strategy using length of waterway and number of waterways as measures	National Water resources report	MINEE, CamWater, Universities, NGO	Continuous
Indicator E 10.1.4 Percentage of area of catchments/regions covered by surface water resource management plans detailing environmental flows	National water resources report	MINEE, CamWater	Continuous
Indicator E 10-1-5 Percentage of area of catchments/regions with groundwater resources which have water/resource management plans detailing groundwater usage and replenishment rates	National water resources report	MINEE, CamWater Universities, NGO	Continuous
Indicator 10 - 1-6 Percentage of catchments with groundwater resources which are over-allocated or are approaching over-allocation	National water resources report	MINEE, CamWater	Continuous
Criterion E.10.2 Establish relevant standards and guidelines for a National Water Quality Management Strategy			
Indicator E-10-2-1 Document on Standards & guidelines on water quality	Existing water quality standards	MINEE, CDE	Continuous
Criterion E.10.3 Assessment of all wetlands in the country is carried out, drawn and implemented with management plans Consistent with management principles of Ramsar Convention on Wetlands			
Indicator E.10.3.1 Number and surface area of wetlands recognised as of international importance;	Reports Decisions Publication		
Indicator E.10.3.2 Number and percentage of Ramsar and other internationally significant wetlands with management plans;	Reports Survey		
Indicator E.10.3.3 % area of significant water bird habitats covered by site management plans, species conservation plans, conservation agreements and other conservation programs;	Activity Reports Project Reports		
Indicator E.10.3.4 Number of Biodiversity offsets to address the increasing demands and uses of wetlands for development projects.	Reports Decisions/Agreements		

6.5 TOOLS FOR MONITORING AND EVALUATION

A variety of written documents are sure to stem from the biodiversity planning and assessment processes which will provide information and ensure political compliance with mandates and commitments, and fostering partnerships. The following steps are proposed;

a) Periodic reports needed, the recipients and reporting interval:

   i Annual status reports on the implementation of the national biodiversity plan, or its various sections to the Focal point in MINEPDED, Parliament and the people,

   ii Five year status reports showing changes in response to various factors, early warning bulletins calling for appropriate actions, and/or

   iii Periodic reports to the CBD.

b) Periodic Reviews (annual, mid-term terminal, short or long term)

c) Reports to adequately Balance content and information which will provide excessive detailed descriptive information on resources and institutions, issues, options and actions needed

d) Promotion of the findings and proposals contained in the reports and reviews to the target audiences through public meetings, workshops etc

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ANNEXES
ANNEX 1a General List of Protected Areas

Nom		*Superficie (ha)*	*Date de création*	*Références texte de création*
1.	JZ de Limbé	0,5	1885	
2.	RF de Douala-Edéa	160 000	1932	Arrêté du 19 Novembre 1932 du Gouverneur Colonial Mr Bonne Carree (réserve de chasse)
3.	RF du Dja	526 000	1950	Arrêté n°75/50 du 25 avril 1950
4.	JZ de Mvog Beti Yaoundé	4,07	1951	
5.	RF de Kimbi	5 625	1964	
6.	RF de Mbi Crater	370	1964	
7.	JZ de Garoua	1,5	1966	
8.	RF de Santchou	7 000	1967	Forêts de montagne et de basse altitude
9.	PN Benoué	180 000	1968	Arrêté n°120/SEDR du 05 décembre 1968
10.	PN Bouba-Ndjida	220 000	1968	Arrêté n°120/SEDR du 05 décembre 1968
11.	PN Kalamaloué	4 500	1968	Arrêté n° 7 du 04 février 1972
12.	PN Mozogo Gokoro	1 400	1968	Arrêté n°120/SEDR du 05 décembre 1968
13.	PN Waza	170 000	1968	Arrêté n°120/SEDR du 05 décembre 1968
14.	RF de Lac Ossa	4 000	1968	**Arrêté n°538 du Haut Commissariat de la République dexxxxx1948**
15.	PN Faro	330 000	1980	Décret N° 80/243 du 8 juillet 1980
16.	PN Korup	125 900	1986	Décret n°86/1283 du 30 octobre 1986
17.	S de Mbanyang-Mbo	66 000	1996	Décret n°96/119/PM du 12 mars 1996
18.	PN Campo-Ma'an	264 064	2000	Décret n°2000/004/PM du 06 janvier 2000
19.	PN Mbam et Djérem	416 512	2000	Décret n°2000/005/PM du 06 janvier 2000
20.	PN Lobéké	217 854	2001	Décret n°1002/107/CAB/PM du 19 mars 1001
21.	PN Mpem et Djim	97 480	2004	2004/0836/PM du 12 mai 2004
22.	PN Vallée du Mbéré	77 760	2004	Décret n°2004/0352/PM du 04 février 2004
23.	PN Boumba Bek	238 255	2005	Décret n°2005/3284/PM du 06 octobre 2005
24.	Parc National de Nki	309 362	2005	Décret n°2005/3283/PM du 06 octobre 2005
25.	Parc National de Bakossi	29 320	2007	Décret n°2007/1459/PM du 28nov 2007
26.	Parc National de Takamanda	67 599	2008	Décret n°2008/2751 du 21 novembre 2008
27.	Sanctuaire de Kagwene	1 944	2008	Décret n° 2008/0634/PM du 03 avril 2008
28.	Sanctuaire à Gorilles de Mengame	27 723	2008	Décret n° 2008 /2207 du 14 juillet 2008
29.	Parc national Mont Cameroun	58 178	2009	Décret n° 2009/2272/PM du 18 décembre 2009
30.	Parc national de Deng Deng	52 347	2010	Décret 2010/0482/PM du 18 mars 2010
	TOTAL	3 659199,07		

Source : DFAP/MINFOF 2013

Annex 1 b List of Protected Areas with Management Plans

Nom		*Superficie (ha)*	*Date de création*	*Références texte de création*
1	PN Benoué	180 000	1968	Arrêté n°120/SEDR du 05 décembre 1968
2	PN Bouba-Ndjida	220 000	1968	Arrêté n°120/SEDR du 05 décembre 1968
3	PN Campo-Ma'an	264 064	2000	Décret n°2000/004/PM du 06 janvier 2000
4	PN Faro	330 000	1980	Décret N° 80/243 du 8 juillet 1980
5	PN Korup	125 900	1986	Décret n°86/1283 du 30 octobre 1986
6	PN Lobéké	217 854	2001	Décret n°1002/107/CAB/PM du 19 mars 1001
7	PN Mbam et Djérem	416 512	2000	Décret n°2000/005/PM du 06 janvier 2000
8	PN Waza	170 000	1968	Arrêté n°120/SEDR du 05 décembre 1968
9	PN Boumba Bek	238 255	2005	Décret n°2005/3284/PM du 06 octobre 2005
10	Parc National de Nki	309 362	2005	Décret n°2005/3283/PM du 06 octobre 2005
11	Parc National de Takamanda	67 599	2008	Décret n°2008/2751 du 21 novembre 2008
12	RF du Dja	526 000	1950	Arrêté n°75/50 du 25 avril 1950
	TOTAL	**3 065 546**		

Source DFAP/MINFOF 2013

Annex 1c Protected Areas with Management Plans under revision

Nom		*Superficie (ha)*	*Date de création*	*Références texte de création*
1	PN Lobéké	217 854	2001	Décret n°1002/107/CAB/PM du 19 mars 1001
2	PN Waza	170 000	1968	Arrêté n°120/SEDR du 05 décembre 1968
	TOTAL	387 854		

Source DFAP/MINFOF 2013

Annex 1d : List of Protected Areas with Managament Plans being developed

Nom		*Superficie (ha)*	*Date de création*	*Références texte de création*
1	Sanctuaire à Gorilles de Mengame	27 723	2008	Décret n° 2008 /2207 du 14 juillet 2008

Source DFAP/MINFOF 2013

Annex 1e : List of Protected Areas prioritized for the development of Managament Plans

Nom		*Superficie (ha)*	*Date de création*	*Références texte de création*
10	PN Mpem et Djim	97 480	2004	2004/0836/PM du 12 mai 2004
11	PN Vallée du Mbéré	77 760	2004	Décret n°2004/0352/PM du 04 février 2004
17	Parc national Mont Cameroun	58 178	2009	Décret n° 2009/2272/PM du 18 décembre 2009
18	Parc national de Deng Deng	52 347	2010	Décret 2010/0482/PM du 18 mars 2010
20	RF de Douala-Edéa	160 000	1932	Arrêté du 19 Novembre 1932 du Gouverneur Colonial Mr Bonne Carree (réserve de chasse)
28	S de Mbanyang-Mbo	66 000	1996	Décret n°96/119/PM du 12 mars 1996
	TOTAL	511 765		

Source DFAP/MINFOF 2013

Annex 1 f: List of Protected Areas underway to be Classified and their Status

	Aires protégées	**Superficie ha**	**Niveau d'avancement**
1.	Parc marin de Kribi	54 140	comission départemental programmé
2.	Parc National de Tchabal Mbabo	150 000	Avis au public signé et affiché
3.	Parc national de Ndongore	230 000	Avis au public signé et affiché
4.	Parc National de Kom	68 905	Dossier au PM
5.	Réserve écologique Intégrale de Koupé	4 676	Dossier au PM
6.	Réserve de Mt Bamboutos	2 500	Avis au public signé et affiché
7.	Changement de Douala Edéa		
8.	Changement de Status de la Réserve de faune de Kimbi	25 000	
9.	Réserve écologique Intégrale de Manengoumba	4 252	Concertation bouclée
10.	Sanctuaire à Gorilles de Bargué	47 686	Avis au public signé et affiché
11.	Sanctuaire de Rumpi Hills	45 675	Cartographie de base
12.	Sanctuaire de Sanaga Nyong	14	Préparation d'une visite du site
13.	Jardin zoologique de Bertoua	1 800	comission départemental programmé
14.	Jardin zoologique de Ebolowa	16	avis au public
15.	Jardin zoologique de Ngaoundéré	90	avis au public
16.	Parc National de Ma Mbed Mbed	17 510	commission départemental programmé
17.	Parc National de la Méfou	1 050	transmis au PM
	Total	628 314	

Source DFAP/MINFOF 2013

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218.	ANNE NTONGHO HOR	WWF
219.	SAME TECLAIRE	WWF
220.	BILA STANISLAS	CARPE/IUCN
221.	KANGA AIME	GEF SMALL GRANTS PROGRAMME
222.	OKENYE MAMBO	GIZ PRO-PSFE, GAROUA
223.	ABDOUL-KARIM ABEL	GIZ PRO-PSFE, GAROUA
224.	FESTUS K. ALI	HEIFER INTERNATIONAL, NORTH WEST
225.	NYUNGWU PAUL	UNDVA, NORTH WEST
226.	GILLES ETOGA	WWF CAMPO
227.	ABDOUL-KARIM ABEL	GIZ PRO-PSFE, GAROUA
228.	NJAMNSHI AUGUSTINE	BDCPC
229.	DINSI STANLEY	NESDA-CA
230.	NECKMEN SAMSON	CBSD
231.	ROGER NGOUFO	CEW
232.	NDO ANGELINE	GREG FORET
233.	GAUDIN GUILLAUME	AQUASOL KRIBI
234.	JACQUES FANCHE	CWCS, DOUALA
235.	SHAN LAWRENCE	TADU DAIRY
236.	FAI FOMINYEN	ASSOCIATION OF MODERN HEALERS
237.	NGUEPKAP TOUKAP JULES	CIFORD BAFOUSSAM
238.	NAH SAMUEL	GDA
239.	ROBINSON DJEUKAM	GDA
240.	NTONGHO ANNE	GREG -FORETS
241.	EDAMANA DOMINIQUE	GREG -FORETS
242.	GAGOE JULIE	SRAFM
243.	OUMAROU SANDA HABANE	MBOSCUDA, CENTRE
244.	JEAN BLANC TAKOU SAGOUAH	ONE MILLANAIRE
245.	JEAN CLAUDE TCHANTCHOUANG	CARFAD
246.	NGEUKAM WAMBE ELIE	OPED
247.	FAI FOMINYEN	ASSOCIATION OF MODERN TRADITIONAL MEDICAL PRACTITIONERS
248.	AMBAN NKORO	ASSOCIATION OF INDIGENOUS PEOPLE, LOLODORF
249.	WABOUF CYPRAIN	CAPEDD
250.	OUGOCK ARMAND	ONG PROTECTION NATURE
251.	BOLEKA JEAN-MARIE	CADDAP
252.	NJAYOU NOMO MOUSTAPHA	CED

253.	ABE EYEBE SIMEON	GREG-FORETS
254.	MBONGO ROLAND NDI	FEDA
255.	NFOR KINSLEY	BDCPC
256.	ZE GABRIEL FELICIEN	SAOJEFAC
257.	MINONG ETIENNE	DIADEM
258.	AMBAN NKORO	ASSOCIATION SUBIBA, BAKOLA PYGMIES
259.	ELANGA ELANGA ROGER	ASSOCIATION AMIS DE LA NATURE
260.	MAMOUDOU ATOUPAINI	ACEEN , MAROUA
261.	TALBA MATTI	GIC PROTECTION DE LA NATURE, MAROUA
262.	NGACEBAI ABRAHAM	ECHOS DES MONTAGNES DE MOKOLO, MAROUA
263.	MOUSSA	ECHOS DES MONTAGNES DE MOKOLO, MAROUA
264.	JEBKALBE PATRICE	GREENSAFE, MAROUA
265.	GYONKEN VINCENT	ENVIROPROTECT, MAROUA
266.	Dr. ABDOU BOUBA ARMAND	GIC ASGEN
267.	DJIDJA DJIALI GARGA	GREENSAFE, MAROUA
268.	MAWA BIENVENU	KEENG SERRI, MAROUA
269.	NJAMNSI NELSON	NEST-CAM, NORTH WEST
270.	NYAMNDI GILBERT	FARMER's GROUP NORTH WEST
271.	FON NSOH	COMINSUD
272.	NDEREM STEPHEN NDJODZEKA	SHUMAS, NORTH WEST
273.	BASI GODLOVE DAIGA	SDDARD, BALI, NORTH WEST
274.	MOHAMMED BAWURO	MBOSCUDA, NORTH WEST
275.	VALA MARY	BOH ETOMA, NORTH WEST
276.	SHANG LAWRENCE	TADU DAIRY COOPERATION SOCIETY, NORTH WEST
277.	STELLA MAH ACHU	COMAFOP-MBENGWI, NORTH WEST
278.	VICTOR FONYUY	TADU DAIRY COOPERATION SOCIETY, NORTH WEST
279.	MFOM ENGO	CADER, KRIBI
280.	ENGOLO SAMUEL	FISHERMEN's GROUP, KRIBI
281.	~~GAUDIN GUILLAUME~~	~~AQUASOL~~
282.	TSAGADIGUI JEAN BLAISE	BAGYELLI INDIGENOUS PEOPLE
283.	NIUKO MI E. GERARD	FONGED
284.	MENYE ONDO VALERY	CEPFILD
285.	MASSO ROSE	CAMEROON ECOLOGY, LITTORAL
286.	SIJOU FOLACK VERONIQUE	WOPA WOMEN'S GROUP, KRIBI
287.	MENYE ONDO VALERY	CEPFILD
288.	MESSE VENANT	BAKA INDIGENOUS GROUP
289.	Prof.ANGONI HYACINTH	UNIVERSITY OF YAOUNDE I
290.	Dr. NKWATOH ATHANASIUS	UNIVERSITY OF BUEA
291.	JEAN MICHEL ONANA	NATIONAL HERBARIUM
292.	Dr. ONANA JOSEPH	CERECOMA KRIBI
293.	Dr. AYISSI ISIDOR	IRAD, KRIBI
	DR. TCHATAT MATHURIN	IRAD, CENTRE
	Dr. NTOUPKA MAMA	IRAD, MAROUA
	Dr. FOTSA JEAN CLAUDE	IRAD, NORTH WEST
	PHAN JOHNSON	IRAD, NORTH WEST
294.	Prof. NWAGA DIEUDONNE	UY1, BIOTECHNOLOGY CENTRE
295.	BEMBONG EBOKONA LUCAS	UY1
296.	DIONE CLAUDE ALBERTINE	UY1
297.	DJANTENG PHANUELLA	UY1
298.	DJUISSI MBA LILIANE	UY1
299.	BAYONG FRITZ	FASA
300.	MOTUE GISELE	UY1
301.	NGO MANTIM VICTORINE	UY1

302.	MAYANG BOUBA FELICTE	UY1
303.	ANU PAUL	UY1
304.	PROF. MADI ALI	UNIVERSITY OF MAROUA
305.	FOJE FERDINAND	UNIVERSITY OF BUEA
306.	KOUEDI PATRICE	MEAO
307.	WILLIAM DJOUMSOP	SOCAPALM, LITTORAL
308.	CHIN RICHARD	UNVDA, NORTH WEST
309.	TCHIKANGWA BERTIN	TRC, DOUALA
310.	MANA BIENVENU	KEEN SERI, GAROUA
311.	HARA TAIDI	PRODEBALT, MAROUA
312.	NYONSE	SEMRY , GAROUA
313.	LAKAYE JEROME	CHAUX ROCA , GAROUA
314.	MAHAMAT ALIFA	SODECOTON, GAROUA
315.	TATA FOFUNG THOMAS	GWL
316.	DAVID MBAH	GWL
317.	AJONINA GORDON	GWL
318.	CHIAMBENG GEORGE	GWL
319.	MESSINE OMBIONYO	GWL
320.	CHUYONG GEORGE	GWL
	MEDIA	
321.	ROSE BANA	VISION 4
322.	FREDERICK MFOM	VISION 4
323.	PERPETUE NGANOMO	SATELLITE FM
324.	TCHONKO BECKY BESSONG	CRTV
325.	ROSE BANA	VISION 4
326.	FREDERICK MFOM	VISION 4
327.	PERPETUE NGANOMO	SATELLITE FM
328.	TCHONKO BECKY BESSONG	CRTV
329.	AMBELA CONSTATIN	BRGE AFRIKA
330.	NGASSA ROSEMARY	VISION 4
331.	EKOBO JEMEA	SATELLITE FM
332.	CLAUDE MVILONGO	VISION 4
333.	FLEURVE PAYO	CAMNEWS 24 TV
334.	ITOE NOAH	CAMEROON TRIBUNE
335.	BEATRICE NGAMO	CANAL 2
336.	CAREL MAZATIA	CANAL 2
337.	LUC MVODO	CANAL 2
338.	GERARD ABADA	LE QUETIDIEN DE L'ECONOMIE
339.	CHRISTELLE BOUDJIEKA	CRTV
340.	PATTY AKO DEFANG	CRTV
341.	MBOSSA PATRICE	CAMEROON TRIBUNE, FAR NORTH
342.	FAMANOU NADASE	CRTV, FAR NORTH
343.	SADOU MAMOUDOU	CRTV, FAR NORTH
344.	YAYA ABOUBAKAR	CRTV, FAR NORTH
345.	MOTTO FORHAM	FOUNDATION RADIO, BAMEDNA
346.	HANS GWET BIKON	CRTV, NORTH WEST
347.	MONIE CLARENCE Y	RADIO HOT COCOA, NORTH WEST
348.	BENJAMIN NGAH	THE INDEPENDENT OBSERVER, NORTH WEST
349.	NCHONG CHRISANTUS	THE HORIZON, NORTH WEST
350.	CHRIS MBUNWE	THE POST NEWSPAPER, NORTH WEST
351.	GRACE NWAFOR	ABAKWA FM, NORTH WEST
352.	AKAM NDUWO ERIC	THE DRUM NEWSPAPER, NORTH WEST