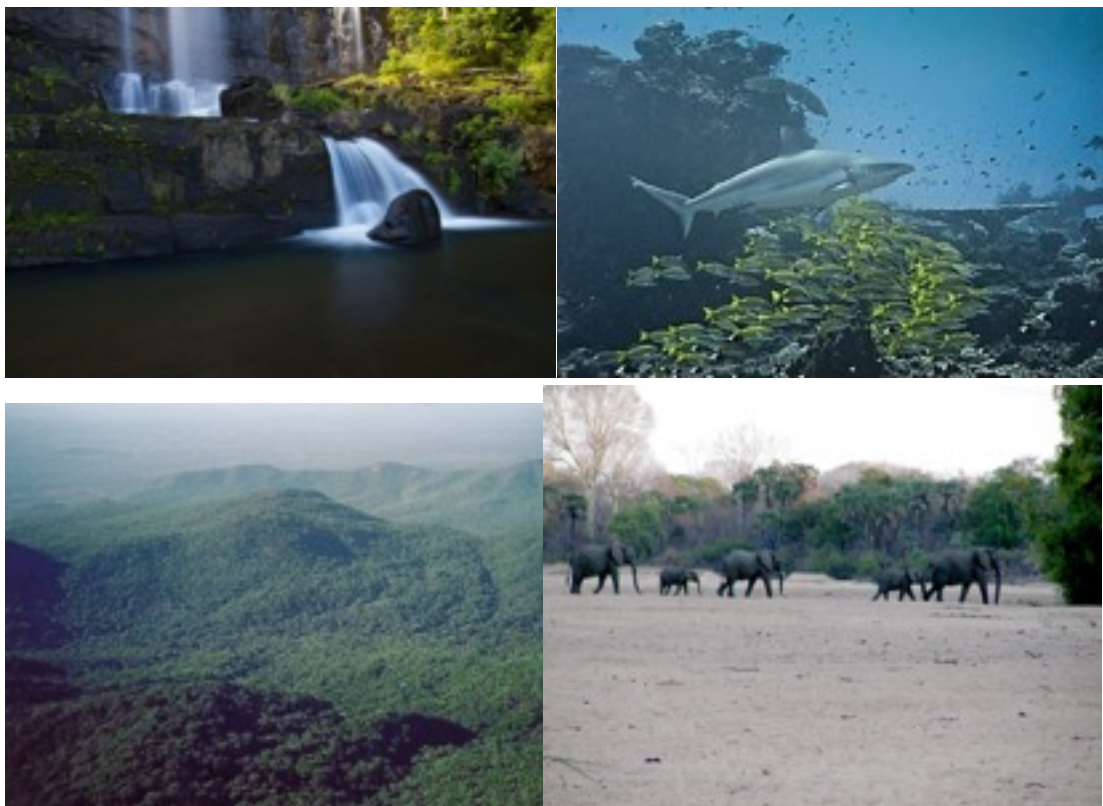




REPÚBLICA DE MOÇAMBIQUE

MINISTÉRIO DA TERRA, AMBIENTE E DESENVOLVIMENTO RURAL
(MITADER)

NATIONAL STRATEGY AND ACTION PLAN
OF BIOLOGICAL DIVERSITY OF
MOZAMBIQUE
(2015-2035)



MAPUTO, 2015



REPUBLIC OF MOZAMBIQUE

President

Filipe Jacinto Nyusi

Ministry of Land, Environment and Rural Development

Minister

Celso Ismael Correia

National Directorate of Environment

National Director

Ivete J.Maibaze



REPUBLIC OF MOZAMBIQUE

MINISTRY OF LAND, ENVIRONMENT AND RURAL DEVELOPMENT

NATIONAL STRATEGY AND ACTION PLAN OF BIOLOGICAL DIVERSITY OF MOZAMBIQUE

General Coordination

Anselmina L. Liphola – MITADER

Technical Coordination and Final editing

Natasha Ribeiro

Supervision

Anselmina L. Liphola e Ana Paula Francisco

NBSAP team

Esperança Chamba

Paulino Munisse

Valério Macandza

Felismina Langa

Natasha Ribeiro

Reference

MINISTÉRIO DA TERRA, AMBIENTE E DESENVOLVIMENTO RURAL (2015).
**ESTRATÉGIA E PLANO DE ACÇÃO PARA A CONSERVAÇÃO DA
DIVERSIDADE BIOLÓGICA EM Moçambique**. Maputo. MITADER. 112 pp.

FOREWORD

Mozambique is characterized by a considerable abundance of natural resources and biodiversity. Like other developing countries, Mozambique's population, mainly rural, depends on natural resources for their survival. Since the end of Civil War in 1992, Mozambique has witnessed a rapid degradation of its natural resources, which derives from greater access to resources by the population, coupled with the weakness of the implementation of national legislation. On the other hand, it has been a boost for Mozambique's economic growth, based on the agricultural, mining and infrastructure sectors, which has originated rapid urbanization. These factors contribute to increased degradation of biodiversity. Despite its importance, the contribution of biodiversity for the growth of Gross Domestic Product (GDP) is not accounted for, although the contribution of the various sectors associated with it (agricultural, mining, etc.) is accounted for. Recognizing the values of biodiversity, Mozambique ratified the Convention on Biological Diversity (CBD), (Resolution 2/94) and signed the Cartagena Protocol on Bio-Safety (Resolution No. 11/2001) and the Nagoya Protocol on equitable and fair benefit access and sharing (Resolution N° 2/2014), thus assuming the principles of conservation of biological diversity and the fair and equitable benefits sharing arising from its sustainable use. Nationally the commitment of Mozambique to the conservation of biological diversity is reflected in the development of a diverse legal and institutional framework. In 2003, Mozambique embarked on the development and implementation of the National Strategy and Action Plan for Conservation of Biological Diversity (2003-2010).

The present strategy was prepared in compliance of decision adopted in the 10th Conference of the Parties (COP10) held in Nagoya, Japan, where the member states discussed and approved the *Global Strategic Plan 2011-2020* and the *Aichi Targets* for biodiversity. In this context, it was required that member states do a review and update their national strategies and action plans (Decision X/2). The preparation of this National Biodiversity Strategy and Action Plan (NBSAP) was made possible by financial support from the *Global Environment Facility* (GEF) through the *United Nations Environment Programme* (UNEP) and the technical support of the Convention Secretariat on Biological diversity.

This Strategy and Action Plan give us overview of general information of the importance of biodiversity not only for national economy, but also gives us the status of conservation biodiversity in Mozambique, trends, treats and its impacts for human well being, underlines the significative achievements, the challenges and perspectives which are presented as goals for the next twenty years.

Constitute the challenges for Mozambique an increase awareness on significance of biodiversity for the life of each person, determination of the value of biodiversity and integration of the economic value of biodiversity into national accounting system and stablishment of payment mechanism for environmental services, redefintion of the present protected areas and inclusion of the centers of endemism of the mountain to national net of protected areas, management of solid and liquid wastes, in order to reduce polltion, among others.

On behalf of the Government of Mozambique and on my own behalf, I would like to thank the team of consultants and all stakeholders involved in the preparation of this National Biodiversity Strategy and Action Plan.



Acknowledgements

The Review of the National Biodiversity Strategy and Action Plan (NBSAP) had the valuable contribution of several national and international key stakeholders engaged in national biodiversity conservation and management, which includes representatives of government and private institutions, national and international non-governmental organizations, academic institutions and others recognized below.

The review process was conducted by a team of experts in various biodiversity related fields, under the supervision of the Minister of Land, Environment and Rural Development, Hon. Celso Ismael Correia, assisted by his advisor, Mrs. Anselmina L. Liphola (former national director of environmental management), which played a crucial role in the success of this process.

The National Biodiversity Unit (UNB) represented by key government sectors, had a leading role in ensuring technical guidance needed for the review process and ensure the integration needs of various sectors. The contribution of members of UNB in the early stages of drafting this document were extremely relevant.

During the process various government and private institutions, national and international NGO's and academic institutions were consulted and through critical inputs have contributed significantly to the improvement of this NBSAP.

A critical review of this document was carried out by a team of experts on biodiversity, through the Secretariat of the Convention on Biological Diversity, who significantly contributed to the improvement of this document.

Financing of the review process was made possible by the *Global Environment Facility* (GEF) through the *United Nations Environment Programme* (UNEP).

Table of Contents

Executive summary.....	14
Chapter I: Introduction.....	19
1.1. Biodiversity and development in Mozambique.....	19
1.3. Methodology for the preparation of this document.....	20
1.4. Structure of the document.....	21
Chapter II: Legal and Institutional Framework.....	23
2.1. International legal framework.....	23
2.2. National legal framework.....	25
2.3. Institutional framework.....	30
Chapter III: THE IMPORTANCE OF BIOLOGICAL DIVERSITY IN MOZAMBIQUE.....	32
3.1. Significance of biological diversity.....	32
3.2. Biodiversity conservation in Mozambique.....	40
3.3. The value of biodiversity in Mozambique.....	41
Chapter IV: ANALYSIS OF MAIN THREATS TO BIODIVERSITY.....	46
Chapter V: BIODIVERSITY STRATEGY: VISION, MISSION, GUIDING PRINCIPLES, STRATEGIC OBJECTIVES AND GOALS.....	51
5.1. Vision.....	51
5.2. Mission.....	51
5.4. Strategic Goals.....	52
5.5. Definition and justification of ational targets and strategic actions.....	56
Chapter VI: ACTION PLAN FOR BIODIVERSITY CONSERVATION.....	69
6.1. The logical framework for the development of the action plan.....	69
6.1.1 Strategic Objectives.....	69
6.1.2. Targets.....	70
6.1.3. Priority actions for intervention.....	70
6.1.4. Time horizon.....	70
6.1.5. Performance indicators.....	71
6.1.6. Institutions responsible for implementation.....	71
6.1.7. Mechanisms for Implementing.....	71
6.2. Synergies.....	71
6.3. Actions Matrix (Note: The year 2017 was taken as a reference for the definition of the targets- See section 6.1.4. Timeframe).....	73
Chapter VII: MECHANISM FOR IMPLEMENTATION, MONITORING, ASSESSMENT AND REPORTING.....	111
7.1 Implementation mechanisms.....	111
7.2. Monitoring and evaluation.....	112
7.3 Report.....	113
Chapter VIII: BIBLIOGRAPHY.....	115

Listo of Figures

Figure 1: The phytogeographic areas of Mozambique (adapted from White, 1983 and van Wyk and Smith, 2001).....	32
Figure 2: Agro-ecological zones of Mozambique.....	35

Figure 3: The three main natural regions of the Mozambican coast.....	37
Figure 4: Synergies between national targets for biodiversity conservation.	57
Figure 5: Summary of responsible institutions and assisting in the implementation of the national strategy and action plan.	107

List of tables

Table 1. Conventions ratified by Mozambique for biodiversity conservation.	22
Table 2. Additional National Legislation relevant for biodiversity conservation in Mozambique.....	28
Table 3. biomes, ecoregions and their state of conservation in Mozambique (Extracted from the <i>Fifth National Report on Biological Diversity in Mozambique</i>).....	33

List of Acronyms

ABS	Access and Benefit-Sharing
CA	Conservation Areas
TFCA	Transfrontier Conservation Area
EIA	Environmental Impact Assessment
EIAS	Environmental and Social Impact Assessment
ANAC	National Administration for Conservation Areas (Administração Nacional das Áreas de Conservação)
BIOFUND	Foundation for Biodiversity Conservation (Fundação para a Conservação da Biodiversidade)
CBD	Convention on Biological Diversity
CIF	Centro de Investigação Florestal (Forestry Research Center)
CITES	Convention on International Trade of Endangered Species
CMS	Convention on Migratory Species
COP	Conference of the Parties
COP-CDB	Conference of the Parties to the Convention on Biological Diversity
CTA	Corpo Técnico e Administrativo (Administrative and Technical Staff)
DCB	Departamento de Ciências Biológicas (Department of Biological Sciences) (UEM)
DPCA	Direcção Provincial para a Coordenação da Acção Ambiental (Provincial Directorate for the Coordination of Environmental Affairs)
DNTF	Direcção Nacional de Terras e Florestas (National Directorate for Land and Forestry)
EMP	Environmental Management Plan

FAEF	Faculdade de Agronomia e Engenharia Florestal (Faculty of Agriculture and Forestry)
FUNAB	Fundo Nacional do Ambiente (National Environmental Fund)
GEAP	Green Economy Action Plan
GdM	Government of Mozambique (Governo de Moçambique)
GDP	Gross Domestic Product
IBA	Important Bird Area
IFC	International Financial Corporation
IIAM	Instituto de Investigação Agrária de Moçambique (Institute of Agricultural Research of Mozambique)
INE	Instituto Nacional de Estatística (National Institute for Statistics)
INGC	Instituto Nacional de Gestão de Calamidades (National Institute for Disasters Management)
IUCN	International Union for Conservation of Nature
MCTESP	Ministério da Ciência e Tecnologia, Ensino Superior e Técnico-Profissional (Ministry of Science and Technology, Higher and Technical and Vocational Education)
MIC	Ministério da Indústria e Comércio (Ministry of Industry and Trade)
MITADER	Ministério da Terra, Ambiente e Desenvolvimento Rural (Ministry of Land, Environment and Rural Development)
MASA	Ministério da Agricultura e Segurança Alimentar (Ministry of Agriculture and Food Security)
MICOA	Ministério para a Coordenação da Acção Ambiental (Ministry for Coordination of Environmental Affairs)

MINEDH	Ministério da Educação e Desenvolvimento Humano (Ministry of Education and Human Development)
MINT	Ministério do Interior (Ministry of Home Affairs)
MIREME	Ministério dos Recursos Minerais e Energia (Ministry of Mineral Resources and Energy)
MISAU	Ministério da Saúde (Ministry of Health)
MTES	Ministério do Trabalho, Emprego e Segurança Social (Ministry of Labour, Employment and Social Security)
MICTUR	Ministério da Cultura e Turismo (Ministry of Culture and Tourism)
MIGECAS	Ministério do Género, Criança e Acção Social (Ministry of Gender, Child and Social Welfare)
MIMAIP	Ministério do Mar, Águas Interiores e Pescas (Ministry of the Sea, Inland Waters and Fisheries)
MEF	Ministério da Economia e Finanças (Ministry of Economy and Finance)
MTC	Ministério dos Transportes e Comunicações (Ministry of Transport and Communications)
NBSAP	National Biodiversity Strategic and Action Plan
NCCS	(National Climate Changes Strategy)
OEA	Strategic Objective A
OEB	Strategic Objective B
OEC	Strategic Objective C
OED	Strategic Objective D
NGOs	Non-governmental organizations
PECODA	Programa de Educação, Comunicação e Disseminação Ambiental (Education, Environmental Communication and Dissemination Program)

PESOD	Plano Económico e Social e Orçamento Distrital (Economic and Social Plan and District Budget)
RDB	Red Data Book
REDD	Reduction Emissions from Deforestation and Degradation
REIA	Relatório do Estudo de Impacto Ambiental (Environmental Impact Assessment Report)
SMART	Specific, Measurable, Realistic and Targeted
SDPI	Serviço Distrital de Planeamento e Infra-Estruturas (Distrital Service for Planning and Infrastructures)
UNB	National Biodiversity Unit (Unidade Nacional de Biodiversidade)
UEM	Universidade Eduardo Mondlane (Eduardo Mondlane University)
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
UTREDD	Unidade Técnica do REDD+ (Technical Unit of REDD+)
WCS	Wildlife Conservation Society
WWF	World Wide Fund for Nature

NBSAP Team:

Esperança Chamba (Strategic Objective A)

Paulino Munisse (Strategic Objective A)

Valério Macandza (Strategic Objective B)

Eulália Macome (Strategic Objective C)

Felismina Langa (Strategic Objective D)

Natasha Ribeiro (National Coordinator)

Executive summary

1. Introduction

Biodiversity is a vital pillar for the development of Mozambique and for the support of the majority of the Mozambican population. It is therefore important that the development based on a sustainable basis in, which the intrinsic value of biodiversity is recognized, valued and preserved through the generations. Thus, it is relevant to define strategic management and conservation measures of national biodiversity.

Recognizing the values of biodiversity, Mozambique ratified the *Convention on Biological Diversity* (CBD, Resolution 2/94) and signed the *Cartagena Protocol on Bio-safety* (Resolution No. 11/2001) and the Nagoya Protocol on *Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS)*. Nationally Mozambique's commitment to the conservation of biodiversity is reflected in the development of a diverse legal and institutional framework.

In 2003, the first *National Biodiversity Strategy and Action Plan* (NBSAP) was approved for the period 2003 to 2010. During the Conference of Parties 10 (COP10) CBD approved the *Global Strategic Plan 2011-2020* and the *Aichi Targets on Biodiversity*, which guides the revision and update of the 2003-2010 strategy (Decision X / 2). In this context, this NBSAP was produced, for a period of 20 years (2015-2035). This document is also based on the *Fifth National Report on Biological Diversity*, which gathers relevant and updated information on biodiversity in Mozambique. The methodology involved 5 phases namely: (i) Nomination and preparation of the work team; (ii) Collection and collation of information at national level; (iii) sectoral consultations; (iv) Review and adjustment of strategic objectives and national goals; and (v) Development and validation of the NBSAP.

2. Legal Framework

Mozambique is a signatory to several international conventions related to biodiversity, some of which are relevant to the conservation of biodiversity, including: *African Convention on the Conservation of Nature and Natural Resources* (Resolution 18/81), *Convention on International Trade of Endangered Species* (CITES, Resolution 20/81), *Bamako Convention on the Protection of the Ozone Layer* (resolution 8/93), *Framework Convention on Climate Change* (UNFCCC, Resolution 1/94), *Convention on the Protection, Management and Development and Marine coastal East Africa Region* (Resolution 17/96), *Convention on Combating Drought and Desertification* (UNCCD, Resolution 20/96), among others.

The national legal framework is characterized by a variety of instruments governing all activities related to biodiversity, including among others, the *Land Law* (Law 19/97), the *Environmental Law* (Law 20/1997), the *Law of fisheries*, the *Law of Forestry and Wildlife* (Law 10/99) and the *Conservation Law* (Law 16/2014), in addition to a series of regulations associated with these laws (eg *Regulation on*

Environmental Impact Assessment, Regulation on Forest and Wildlife and General Regulation on Maritime Fishery Activities). While some of these instruments need to be improved and consolidated, this can be considered a foundation for the implementation of activities under this strategy and action plan.

The Mozambican institutional framework is very rich and diverse, composed of government institutions (represented from the national to local level), national and international non-governmental organizations (NGOs), civil society organizations, private sector, local communities and their organizations, research and higher education institutions. The *National Biodiversity Unit* (NBU), established in 2000, should be strengthened to play a more active role in implementing this NBSAP. Recently, the REDD⁺ Technical Unit (UT- REDD⁺) was reactivated, whose main mission is to promote and coordinate activities related to the REDD⁺ mechanism in Mozambique. This will have an important role in implementing this strategy and action plan primarily on issues related to climate change and REDD⁺. In recent years there has been an investment in the training of these institutions and a greater openness to collaboration and institutional coordination. However, it is important to improve national capacity and collaboration between the private sector and the government and local communities to achieve the objectives of this strategy.

3. The importance of biological diversity in Mozambique

Mozambique has 3 groups of important natural ecosystems: (i) terrestrial ecosystems; (ii) coastal and marine ecosystems; and (iii) interior waters ecosystems. These cover a considerable biological diversity estimated 6.000 species of plants and 4.200 species of animals (3.075 insects, 726 birds, 214 mammals, 171 reptiles and 85 amphibians). There is a considerable potential for production and agricultural and livestock diversity, which is spread over 10 agro-ecological zones. In terms of coastal and marine biodiversity 194 species of coral, 9 species of mangrove, 13 seagrass species, 5 of turtles, 18 of marine mammals (seven species of dolphins, 8 of whales, 2 seals and 1 species of dugong), 2,626 species of sea fish (800 species associated with coral reefs, 92 cartilaginous fish) and 1.363 species of mollusks are recorded. The aquatic biodiversity is also recognized with emphasis on the Lake Nyasa and the Zambezi Delta.

Recognizing the value of biodiversity, Mozambique has focused on conservation measures, especially *in-situ*, which is demonstrated by the fact that 26% of the country is covered by Conservation Areas (CAs), being 13 inland and 2 marine. In recent years, were created three National Reserves, a National Park and several game reserves and hunting concessions (*Coutadas*) and community conservation areas. However, the current situation of the CAs reveals the need for an update on the current state of biodiversity in these areas, their limits and their management systems (to ensure a stronger partnership with local communities). Biological diversity in Mozambique is also registered at the level of *ex-situ* conservation systems, which

include botanical gardens, arboreta, seed banks, in-vitro collections, semen banks, zoo and aquariums. These initiatives require better management and systematization.

Biodiversity is fundamental in Mozambique to poverty alleviation and to the economic development in general, since 90% of the rural energy comes from wood and charcoal and more than 80% of the population uses the goods and services offered by biodiversity for their survival. Biodiversity values can be grouped into the following categories: (i) forest resources (timber and non-timber) and wildlife; (ii) fisheries; (iii) agriculture and livestock resources; (iv) tourism resources; and (v) mineral resources.

4. Analysis of the main threats to biodiversity

Human activities are the direct causes of changes in land use, which may result in loss or reduction of biodiversity, and operate at various spatial scales. The main threats to biodiversity in Mozambique are:

- Conversion, loss, degradation and fragmentation of natural habitats;
- Overexploitation of certain species;
- Invasion by non-native species that damage ecosystems and native species;
- Pollution and contamination of natural habitats or species; and
- Climate change.

The rapid economic development of the country in the last five years has dictated a strong pressure on biodiversity. In fact, the investment in the infrastructure sectors, mining (coal and minerals), agriculture (mainly commercial large-scale), forests (forest plantations of exotic species and selective logging of native species) and fisheries has resulted in considerable changes of natural ecosystems and biodiversity, which are still little known and reported. Furthermore, the illegal exploitation of forest and wildlife and mineral resources is a major threat to biodiversity conservation in Mozambique.

5. Strategy of biodiversity: vision, mission, guiding principles, strategic objectives and goals

This strategy is based on the following vision: *"In 2035, the ecological, socio-economic and cultural value of biodiversity in Mozambique will contribute directly to improve the quality of life of Mozambicans, derived from its integrated management, conservation and fair and equitable use"*.

The mission for this strategy was defined for the next 20 years: *"To ensure the conservation of biodiversity through the integration, training, financing and the strengthening of partnerships between the different sectors of society."*

This strategy is based on 11 guiding principles, four strategic objectives and 20 goals. The new strategy is based on a long-term view (2015-2035). The principles that support interventions on biodiversity and strategic objectives are in line with national priorities. The national targets were set based on the *Aichi Global Targets* and has as reference to the current state of knowledge of biodiversity and national capacity. Thus, a 2-year period was defined (2015-2017) for the creation of the fundamental bases of implementation (legislation, knowledge and capacity). Thus, 2017 was considered the reference year for the establishment of national targets. To achieve the strategic objectives and goals in 2035, Mozambique focus on collaboration with the global community.

6. Action plan for the conservation of biodiversity in Mozambique

The *National Action Plan for the Conservation of Biological Diversity* is divided into 7 major components: 1) 4 strategic objectives; 2) 20 National targets; 3) Priority actions for the operation; 4) Time horizon; 5) Performance indicators; 6) Budgeting and 7) Responsibility in implementation. The plan addresses biodiversity issues considering synergies with other important instruments such as the *National Strategy for Adaptation and Mitigation of Climate Change* and the *Strategy and Action Plan to Combat Against Drought and Desertification*.

For each goal, defines various strategic actions, which aim to be realistic in terms of national capacity to carry on the proposed period of 20 years. The strategic actions will be evaluated and monitored through performance indicators, which are intended to be specific, measurable, attainable, realistic and time-oriented. The responsibility of the various key sectors in prioritizing actions for the conservation of biodiversity (including private) is also important to the success of the action plan. Thus, these actors have been identified as to their mandates and areas of intervention. Some of these actors were consulted and participated in the process of defining interventions postulated in this plan.

7. Implementation mechanisms, monitoring, evaluation and reporting

The effective implementation of this strategy should use mechanisms and institutional structures in Mozambique. MITADER will coordinate all activities provided in this document, but all key sectors should mainstream biodiversity in their activities. It is important to fully engage the private sector, non-governmental organizations (NGOs), international agencies and local communities. The *National Biodiversity Unit* (NBU) should play a key role in assisting the MITADER for the implementation, evaluation and monitoring of this NBSAP. Therefore, the process of annual planning at all levels should include activities proposed in this action plan. To

this end, it is crucial that the focal point for environmental area in each sector is enabled and actively participate in this process.

Monitoring and evaluation should also be included in the planning of annual activities of the different sectors. Some essential elements for an effective system of monitoring and evaluation are: i) The baseline changes in ecosystems; ii) The reference time established for this strategy, as the year 2017; iii) The presentation of the results noticeably for decision makers, interest groups, etc .; iv) Provide reliable and timely information on populations of animals and plants, trends and dynamics; v) Monitor the impact of the implementation of the activities, policies and laws related to biodiversity; vi) To assess trends in social, political and economic factors; and vii) Assess trends in monetary and non monetary values of biodiversity and the costs and existing investments.

Chapter I: Introduction

1.1. Biodiversity and development in Mozambique

Mozambique is located on the Southeast Coast of Africa, between the parallels 10° 26' 27" S Latitude South and meridians 30° 12' 40" E Longitude East. It has a total area of 799,380 km² and a long coastline that stretches for about 2,700 km along the Indian Ocean. The extent and location along the coast and downstream of major river basins, gives the country a diversity of agro-ecological conditions which involves terrestrial, marine and aquatic, biodiversity, unique in the southern African region.

Indeed, Mozambique is characterized by a variety of terrestrial, marine and freshwater ecosystems, which contain a great diversity of species (flora and fauna). Socio-economic characteristics of the country give it a peculiar situation in terms of biodiversity conservation. In fact, more than half of the Mozambican population, estimated at 24 million people (and an annual growth rate of about 2%, INE, 2007) lives in rural areas. On the other hand, the national and rural economies of Mozambique also depend on the goods and services provided by biodiversity. However, the country's economic growth [expressed as the growth, in 2014, of the Gross Domestic Product (GDP) in 7% (www.ine.gov.mz)], has not been translated into relevant structural changes in rural areas, and the production base is still largely dependent on natural resources using rudimentary and unsustainable techniques, causing a strong pressure on biodiversity.

In this context, it is crucial that the development process is based on a sustainable basis, in which the intrinsic value of biodiversity is recognized, valued and preserved throughout future generations. To this end, it is relevant the definition of strategic management measures and conservation of national biodiversity.

1.2. Review of the 2003-2010 National Strategy and Action Plan and temporal horizon for this NBSAP

Recognizing the importance of national biodiversity and in accordance with the requirements of the CBD (Article 6), Mozambique approved in 2003, the first National Strategy and Action Plan for Biodiversity Conservation for the period 2003-2010. This was designed to implement the three main objectives of the CBD, namely: reduce and prevent biodiversity loss, promote its value, and carry out legal and institutional reforms to ensure better planning and implementation of the strategy. The strategy 2003-2010 was only partially implemented due to constraints of various kinds, especially the weak institutional capacity, the null mainstreaming of biodiversity issues into sectoral activities, as well as poor inter-sectoral coordination.

During the Conference of the Parties 10 (COP10) in Nagoya, Japan, member states discussed and approved the *Global Strategic Plan 2011-2020* and the *Aichi Targets* for biodiversity. In this context, it was required that member states do a

review and update their strategies (Decision X / 2), to include the postulates in the new instrument governing the global level biodiversity conservation. Thus, Mozambique began in 2011 to review the National Strategy 2003-2010, which culminates in this document. This strategy aims to address the limitations of the previous strategy, through greater involvement of sectors of Mozambican society in the design, implementation and monitoring of the main actions. The temporal horizon of this strategy and action plan of 20 years (2015-2035), takes as its starting point the existing gaps in knowledge, human and financial capacity, and mainstreaming into sectoral plans. It acknowledges the need for a preparation period of three years (2015-2017) to create the foundations for the full implementation of this guidance document.

1.3. Methodology for the preparation of this document

The preparation of this document was based on the postulates in the *Global Strategic Plan 2011-2020* and the *Aichi Targets*, in the NBSAP 2003-2010, and the Fifth National Report on Biodiversity. The latter was considered to be the fundamental basis, because in addition to gather relevant and updated information on biodiversity, contains an analysis of the level of achievement of the first strategy. On this basis, the process followed in the preparation of this strategy and action plan included the following phases:

Phase 1: Nomination and preparation of the work team

The teamwork, designated by the Ministry of Land, Environment and Rural Development (MITADER) consists of 6 professionals of the agricultural sector related to the areas of agriculture, wildlife, forests, planning and tourism, representing different government sectors in Mozambique (eg ministries, institutions research and higher education).

This phase included the mobilization and preparation of the work team, the definition and discussion of the terms of reference of each team member.

Phase 2: Collection and collation of information at national level

This phase, basically individual, consisted first, in the review of the NBSAP document from 2003-2010, and the Fifth National Report on Biological Diversity in Mozambique, followed by a comprehensive individual bibliographic compilation.

Also involved the consultation of several other countries' strategies, culminating in the compilation of the relevant literature and information for each member of the team, and presentation of a single report.

Phase 3: Revision and definition of strategic objectives and national targets

This phase involved active discussions within the working team in order to adjust the global strategic objectives and targets to the national context. For that the, the team used the baseline analysis on the status of biodiversity and the threats to biodiversity in the country. These were validated in several national workshops.

Phase 4: Development and validation of the National Plan

Using the logical framework method, strategic actions at national level were drawn, which aim to be realistic for the term of this document (20 years), in the light of the national context. The action plan was validated in a national workshop, and through consultations electronically to various professionals.

In order to ensure consideration of all key aspects of biodiversity, and involve all stakeholders, the study followed a participatory approach involving:

- Internal discussion within the review team;
- Presentation and discussion of drafts of the document with the National Biodiversity Unit;
- Presentation and discussion of the document in two national seminars; and
- Discussion, via electronic media.

In general, the meetings resulted in active discussions by which the participants demonstrated high commitment to implement this NBSAP and to incorporate the activities in the respective sectors. The consultation to the rural communities was not carried out due to time and resources constraints. However, during the stakeholders consultations, the participants were requested to take into consideration their experience in working with rural communities, in order to incorporate their expectancies and needs.

1.4. Structure of the document

This document is divided into seven main chapters, namely:

Chapter I, introducing this document, emphasizing the ecological, social and economic importance of biodiversity in Mozambique. It also states, international and national commitments made by the Government of Mozambique (GoM), and finally presents a description of the methodological process followed in the preparation of this document.

Chapter II, which describes in detail the legal framework (national and international), as well as the institutional framework which underscores this strategy, analyzing simultaneously the opportunities and constraints of these instruments for the successful implementation of the defined strategy.

Chapter III, which describes in a systematic way the importance of biodiversity in Mozambique with particular reference to the *Fifth National Report on Biological Diversity in Mozambique*, and summarizes the information regarding the main phytogeographical zones, biomes and ecoregions in terms of biological diversity. The chapter gives emphasis to the current conservation areas system and recognizes the urgency in implementing effective management measures and the revision of Conservation Areas System. It is also gives emphasis to conservation activities (*in-situ* and *ex-situ*) that have been carried out in the country, as well as the value of goods and services provided by biodiversity Mozambican population.

Chapter IV addresses the major threats to national biodiversity, highlighting the main points mentioned in the *Fifth National Report on Biological Diversity in Mozambique*, in order to allow a statement of strategic objectives and goals defined in this document.

Chapter V, which presents the vision, mission and justifies the strategic objectives and national targets in terms of their relevance, priority and application in the Mozambican context.

Chapter VI establishes a national action plan indicating logical thinking used in their preparation, the need for synergies, implementation strategies, and aspects of monitoring, evaluation and reporting. The action plan sets forth, for each goal, the strategic actions, the time horizon, the performance indicators, the institutions responsible and collaborating and a tentative budget.

Chapter VII establishes the necessary mechanisms for the implementation, monitoring and reporting.

Chapter II: Legal and Institutional Framework

2.1. International legal framework

This NBSAP falls within the CBD's requirements and is one of the commitments made by Mozambique under the various national, regional and international initiatives for the protection of biological resources and fair and equitable use and sharing of benefits. This document is the fundamental basis for the integration of biodiversity into all sectors at the national level, and the involvement of all stakeholders in decision-making and action. Table 1 shows the international conventions ratified by Mozambique to date.

Table 1. Conventions ratified by Mozambique for biodiversity conservation.

Convention	Year of ratification	Biodiversity related topics
African Convention on the Conservation of Nature and Natural Resources	1981 (Resolution 18/81)	Recognizes the vital importance of natural resources, eg flora, fauna, water and soil, to the well-being of African populations.
Convention on International Trade in Endangered Species (CITES)	1981 (Resolution 20/81)	Recognizes that various species, animals and plants represent an irreplaceable part of natural ecosystems.
Bamako Convention on the Protection of the Ozone Layer	1993 (Resolution 8/93)	Recognizes the effects of changes in ozone layer on ecosystems and organisms.
Framework Convention on Climate Change (UNFCCC)	1994 (Resolution 1/94)	Recognizes the elevated natural greenhouse effect, caused by human activities, and evaluates the extent they affect adversely the natural ecosystems and humankind; also recognizes the role of terrestrial and marine ecosystems as carbon sinks.
Convention on Biological Diversity (CBD)	1994 (Resolution 2/94)	

Convention on the Protection, Management and Development Marine and Coastal East Africa Region	1996 (Resolution 17/96)	Recognizes the special characteristics of marine ecosystems (hydrographic and ecological), and the threats they face from pollution and poor integration in the development process.
Bamako Convention on the Prohibition of Hazardous Waste Import, and controls Transboundary movements of such wastes in Africa	1996 (Resolution 19/96)	Recognizes the increasing complexity of production and toxic waste and the effects on human health and biodiversity.
Convention to Combat Drought and Desertification (UNCCD)	1996 (Resolution 20/96)	Recognizes that desertification is caused by complex interactions among physical, biological, political, socio-economic and cultural factors.
Cartagena Protocol on Biosafety	2001 (Resolution n.º 11/2001)	Establishes mechanisms to protect biodiversity and human health risks of Genetically Modified Organisms (GMOs)
Convention on the Protection of Wetlands (RAMSAR)	2003 (Resolution 45/03)	Recognizes the ecological importance of wetlands as regulators of hydrological regimes and habitats of specific flora and fauna species (including migratory).
Stockholm Convention on Persistent Organic Pollutants	2004 (Resolution 56/04)	Recognizes the toxic effects of pollutants on biological tissues and transported across borders.
Bonn Convention on Migratory Species (CMS) –	2009	Recognizes the importance of conservation of special habitats of migratory species.

Nagoya Protocol	2014	Supplementary agreement to the CBD for regulating access to genetic resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS).
Model of sustainability from the <i>International Financial Corporation (IFC)</i> - environmental and social performance standards (PS 6)		Provides guidelines for identifying risks and impacts from development activities, ensuring the conservation aspects of biodiversity.

The diversity of ratified Conventions by Mozambique related to biodiversity reveals the variety of synergies that this NBSAP should take into consideration. It is worth noting that for some of ratified Conventions, there are separate instruments (eg National Climate Change Strategy (NCCS) and National Strategy and Action Plan to Combat Drought and Desertification whose relevance is recognized in this document. Therefore where appropriate, actions and indicators are harmonized with those instruments.

2.2. National legal framework

The *national legal framework* is characterized by a variety of instruments governing all activities related to biodiversity, including among others, the *Law on the Environment*, the *Land Law*, the *Law of Fisheries*, the *Law of Forestry and Wildlife*, the *Tourism Law* and the *Law of Conservation Areas*, as well as a series of regulations associated with these laws (eg *Regulation of Environmental Impact Assessment*, *Regulation of Forestry and Wildlife* and the *General Regulation of Fisheries and Maritime Activities*). While some of these instruments need to be updated, consolidated and its implementation strengthened, is it worth to consider their value for the implementation of activities under this strategy and action plan. Below, we present briefly the essential elements for biodiversity conservation, presented in some of these tools:

a) Policies and environmental strategies

Several key policies and strategies have been recently adopted or are being prepared and / or reviewed. The most relevant for this strategy and action plan are *NCCS*, *Strategy and Action Plan Combat Drought and Desertification*, the *Strategic Environmental Assessment for Coastal Zone Management*, the *Action Plan for Green Economy (GEAP)*, *Strategic Plan for the Tourism Sector (SPTS)*, among others. Except for *NCCS*, the *GEAP* and the *SPTS*, other documents are still being prepared, but contain essential elements for biodiversity. Other policies relevant for this strategy are: *Biofuels Policy and Strategy* (Resolution No. 22/2009 of 4 October), *Policy on New and Renewable Energy* (Resolution No. 62/2009 of 14 October) and *Conservation Policy and Strategy for its Implementation* (Resolution No. 63/2009 of 02 November).

b) Environmental Law (Law 20/1997)

The *Environment Law* is the main instrument for all environmental activities in Mozambique. Of particular relevance to biodiversity are: (i) Article 4, which discusses the general principles of environmental management, which should be based on rational use and management, enhancement of local knowledge, awareness, integrated vision of the environment, participation wide, equal access, accountability and national and international cooperation; and (ii) numbers 1 and 2 of Article 12 on Biodiversity Protection, which refer, respectively, to "*is prohibited all activities against the conservation, reproduction, quality and quantity of biological resources, especially those threatened with extinction*" and "*he Government shall ensure that (a) appropriate maintenance and regeneration of species action is taken; (b) rehabilitation of degraded habitats and creation of new habitats, mainly by controlling the activity or use of substances that may harm the wildlife species and their habitats; and (c) special protection of plant species threatened with extinction or of the botanical specimen that require special protection due to their genetic potential, size, age, rarity, scientific and cultural value*".

c) Land Law (Law 19/97)

The *Land Law* establishes the principles of constitution, exercise, modification, transfer and termination of land use rights, recognizing that land in Mozambique is state owned. Of particular importance for biodiversity conservation, are the articles 7 e 8 establishing respectively, *Total Protection and Partial Protection Areas*, both for nature protection and therefore biodiversity. Article 24 recognizes the

role of local communities in natural resource management, conflict resolution, among others.

d) Law of Forestry and Wildlife (Law 10/99)

The Forestry and Wildlife Law promotes the sustainable use and protection initiatives, conservation of forest and wildlife resources. All articles of this Law are, directly or indirectly, related to the conservation of biological diversity in Mozambique.

e) Conservation Areas Law (Law 16/2014)

The new *Law of Conservation Areas* is of fundamental importance for biodiversity conservation, since it introduces new elements, including:

- i) A comprehensive categorization of protected areas, in which 10 categories are grouped into protected areas (3 categories), and sustainable use areas (7 categories). This categorization allows a more robust and flexible response to the conservation of biodiversity, and the involvement of local communities in their management.
- ii) Assign the management plans of protected areas as important as the plans of territorial management (Article 43.2). The law considers the penalty for certain crimes against wildlife, through significant fines.
- iii) Introduces innovations in resource mobilization, which include fees for access and use of natural resources, compensation for conservation efforts and ecological services from conservation areas (Artigo 49).
- iv) States that the right to use and benefit from carbon sequestration initiatives in conservation areas and their buffer zones, lies in the management of these areas authorities, and should be marketed in collaboration with public and private entities (Article 11.3).

This law represents the first legal tool in Mozambique that refers to "*no net loss of biodiversity*" to indicate that public and private entities engaged in natural resources in conservation areas or their buffer zones should compensate for the negative impacts (Article 11.2).

f) Fisheries Law (Law 3/90)

The *Fisheries Law* regulates the fishing activity in the country, but however, does not specifically addresses the issues related to biodiversity conservation. Article 8 of this Law refers to the development plans, but without referring to the importance of the conservation of fishery resources in the development of these plans. The *Regulation of the Law* (Decree 43/2003) includes some guiding elements for the

conservation of biodiversity, and in particular Article 8 refers to the importance of direct and indirect management measures, Article 9 limits the fishing effort, and Article 10 limits the volume of catches.

g) Mining Law (Law 20/2014) and its regulations (Decree 26/2004)

The new *Mining Law* does not provide a strong focus on environmental protection, whilst stating that mining activities should consider, among others, the conservation of biodiversity (Article 68b). Chapter IX (Articles. 68-73) refers to environmental issues inherent to mining, but not explicitly in relation to biodiversity. In its Article 32, c), states that it is the responsibility of MITADER to coordinate the qualification and quantification of the environmental damage caused by mining activities. Reinforces the need of the *Environmental Management Plan* (EMP), and refers to the automatic cancellation of mining license if the EMP is not submitted (Article 11), placing the responsibility for environmental damage in the operator (Article 20). In terms of pollution, refers, for example, contamination of waters derived from mining operations to be corrected by returning it to its original state (Article 15).

h) Evaluation of the Environmental Impact Assessment Regulation (Decree 45/2004)

The *Regulation on the Assessment of the Environmental and Social Impact Assessment* (ESIA) is the instrument that regulates the environmental licensing in Mozambique; however, some sectors such as mining (Decree 26/2004) and the oil (Decree 56/2010) have their own details.

The regulation requires that all large-scale projects as well as all activities carried out in the protected areas (Category A projects, contained in Annex I) are subject to a detailed *Environmental and Social Impact Study* (ESIA). It also requires that all projects, regardless of their category (A, B or C) must be accompanied by an EMP. Once approved this plan, the proponent must incorporate it in their activities. Thus, from the point of view of the biodiversity, the EMP must necessarily incorporate specific measures for the prevention, mitigation or compensation for the loss or reduction of biodiversity. However, there are some aspects that should be improved in the ESIA process, including the methodologies for measurement and analysis of impacts, especially the residual, cumulative and indirect, which are not

fully aligned with Articles 4 and 12 of the Environment Act and lack the requirement of an independent review of the *Environmental Impact Assessment Reports* (REIAs). Since the Decree 45/2004 is currently under review, these and other aspects should be taken into account.

i) Regulation of the Coastal and Marine Pollution (Decree 45/2006)

This decree demand full compensation for all forms of pollution caused by ships and platforms.

j) Regulation on Benefits Access and Sharing of from Genetic Resources and Associated Traditional Knowledge (Decree 19/2007)

It establishes rules for access the components of genetic resources and their protection, as well as the traditional knowledge associated with it and relevant to the conservation of biological diversity, its sustainable use, including fair and equitable benefits sharing derived from their use and exploitation.

Other legal instruments of relevance to the implementation of this strategy and action plan are presented in Table 2.

Table 2. Addittional National Legislation relevant for biodiversity conservation in Mozambique.

Category	Description
Decree nº 25/2008, of 1 of July	Regulation for Invasive Alien Species Control.
Decree nº 23/2008, of 1 of July	Regulation on Territorial Planning
Resolution nº 10/2009, of 4 of Outubro	Strategy on Energy
Resolution nº 58/2009 of 29 of December	Strategy for Conflict Human / Wildlife Management.
Ministry Diploma nº 181/2010, of 3 of November	Directive on the expropriation in the process of territorial planning.
Decree nº 56/2010, of 22 of November	Environmental Regulation of Petroleum Operations.
Decree nº 25/2011, of 15 of June	Regulation on Environmental Audit Process.

Decree n° 58/2011, of 11 of November	Biofuels regulation and their blends with fossil fuels.
Resolution n° 67/2011 of 21 of December	Designates the Lake Niassa as a Wetland of International Importance.
Resolution n° 8/2012 of 13 of April	Grants to the Foundation for the Conservation of Biodiversity - Biofund, the Statute of Public Utility.
Decree n° 16/2013, of 26 of April	Regulation on International Trade of Endangered Species of Fauna and Flora.
Law 21/2014, of 18 of August	Grants respect of national interests, work, navegation, research and conservation of marine ecosystems, among other natural resources, including the general environment.

2.3. Institutional framework

The *Mozambican institutional framework* is very rich and diverse, composed of government institutions (represented from the national to local level), nongovernmental organizations (NGOs), national and international civil society organizations, private sector, local communities and their organizations, research and higher education institutions. In recent years there has been an investment in the training of these institutions, especially government and local, on various matters related to biodiversity. There has also been a greater openness to collaboration and institutional coordination, although still exist some shortcomings, which should be resolved in the implementation of this NBSAP. The collaboration between the private sector and the government and local communities is still not significant (and often null) and should therefore be strengthened to achieve the objectives of this strategy.

MITADER is the key institution in implementing this strategy since coordinates all environmental activity, and is the national representative of all environmental conventions ratified by Mozambique. MITADER through its national and provincial departments, and district offices, via the District Services on Planning and Infrastructures (SDPI), should ensure and monitor the full implementation of postulated herein. To bust the collaboration among institutions, in 2000 former *Ministry for Coordination of Environmental Affairs* (MICOA) created the *National Biodiversity Unit* (NBU), which consists of a diverse group of professionals (government institutions, international NGOs, academic and research institutions),

whose mission is to support the MITADER in decision-making on biodiversity. However, due to lack of power this unity did not accomplish its mandate fully and the participation of private sector is weak. It is acknowledged that a strong NBU could play an important role in the implementation process of the NBSAP. The National Council for Sustainable Development (CONDES) has a key role in implementing this NBSAP since it represents the advisory institution to the GoM. The technical REDD+ unit (UT-REDD+) was recently reactivated and its mission is to promote and coordinate activities related to the REDD+ mechanism in Mozambique. UT-REDD+ has a relevant role in implementing this NBSAP, especially in those aspects related to climate changes and REDD+ activities.

In 2011 the *National Administration of Conservation Areas* was created (ANAC), a public body under the jurisdiction of MITUR, which is to be endowed with legal personality, administrative and financial autonomy and equity. Currently ANAC is under jurisdiction of MITADER. The aim of the ANAC creation is for greater dynamism in the management of conservation areas in Mozambique, by promoting biodiversity conservation initiatives, promoting the sustainable use of protected areas, and establishing partnerships for their development.

Other sectors relevant to this strategy are the fisheries represented by the *Ministry of Sea, Interior Waters and Fisheries* (MIMAIP), agriculture, livestock and planted forests represented by the *Ministry of Agriculture and Food Security* (MASA), education represented by the *Ministry of Education and Human Development* (MINEDH), mining and energy represented by the *Ministry of Mineral Resources and Energy* (MIREME), and science and technology represented by the *Ministry of Science and Technology, Higher and Technical Education* (MCTESTP). The *Ministry of Economy and Finances* (MEF) plays a crucial role, as they must ensure a harmonized integration of biodiversity issues in all sectors allowing proper planning of activities defined in this document.

All ministries have environmental units to be responsible for integrating the postulate in this strategy at the sectoral level. It is important to note that the governmental institutions still need of strengthening its technical and financial capacity to perform the basic tasks referred to in this document. Thus, it is important to continue to invest in technical training, culture of work and innovation.

Local communities and their organizations, as holders of local knowledge and directly dependent on the goods and services provided by biodiversity, should be seen as the key player in the conservation of biological diversity. To this end, there should be an investment in training, allocation of benefits and responsibility of this group in order to allow their full involvement.

International NGOs (eg IUCN, WWF, WCS, etc.) represent an important ally in mobilizing resources for the implementation of this strategy. In 2011 the *Foundation for the Conservation of Biodiversity* (Biofund) was created, which is a Mozambican private institution whose mission is to support the conservation and sustainable management of natural resources and aquatic and terrestrial biodiversity, including the consolidation of the national system of areas conservation. In turn, national NGOs and civil society organizations represent strong partners for the implementation and training, especially at the local level. Research and academic institutions, in turn, represent the pillar in the production and dissemination of knowledge on biodiversity, while higher education institutions are relevant for higher education and training of human resources.

Chapter III: THE IMPORTANCE OF BIOLOGICAL DIVERSITY IN MOZAMBIQUE

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 (Article 2 of the *CBD*). Biodiversity is constantly changing; it can be increased through genetic changes and evolutionary processes, or reduced due to various natural and anthropogenic threats.

The *Fifth National Report on Biological Diversity of Mozambique* thoroughly describes the current status and trends of biodiversity in the country. Thus, this document is not intended to replicate the existing information in that report, but rather to analyze it to justify the goals and actions proposed in this NBSAP.

3.1. Significance of biological diversity

a) Terrestrial Biodiversity

Mozambique is covered by a diversity of ecosystems and species of global importance for biodiversity conservation and is part of the 5 main phytogeographical zones of Southern Africa, namely: (i) Regional Mosaic Maputaland-Tongoland; (ii) Afromonantane Endemism Center; (iii) Zambezian Regional Centre of Endemism; (iv) Swahilian Regional Centre of Endemism (Regional Mosaic Zanzibar-Inhambane); and (v) Regional Swahilian-Maputaland Transition Zone (White, 1983; Burgess and Clarke, 2000; Van Wyk and Smith, 2001) (Figure 1). In these phytoregions there are 5 different phytocoria, subdivided into 12 ecoregions (Burgess et al., 2004) that are in different states of conservaion (Table 3) and represent

important biodiversity *hotspots* and endemism areas. The main diversity hotspots and plant endemism in Mozambique include the endemic centers of Maputaland and Chimanimani, coastal forests and the mountains-island "*inselbergs*" in northern Mozambique.

Recent estimates indicate that the total number of plant species in Mozambique is of 6.000, of which more than 300 species of plants are on the red list of the IUCN, 22% of which are endemic. According to this list, a species was extinct (*Sueda* sp.), 6 species of *Encephalartos* are critically endangered (*Encephalartos lebomboensis*, *E. munchii*, *E. ngoyanus*, *E. pterogonus*, *E. senticosus* and *E. umbeluziensis*), and other 6 are threatened (*Crassula maputensis*; *Icuria dunensis*, *Cyphostema barbosa*, *Encephalartos aplanatus*, *E. chimanimaniensis* and *Sarcocornia mossambicensis*) (Izidine & Bandeira, 2002).

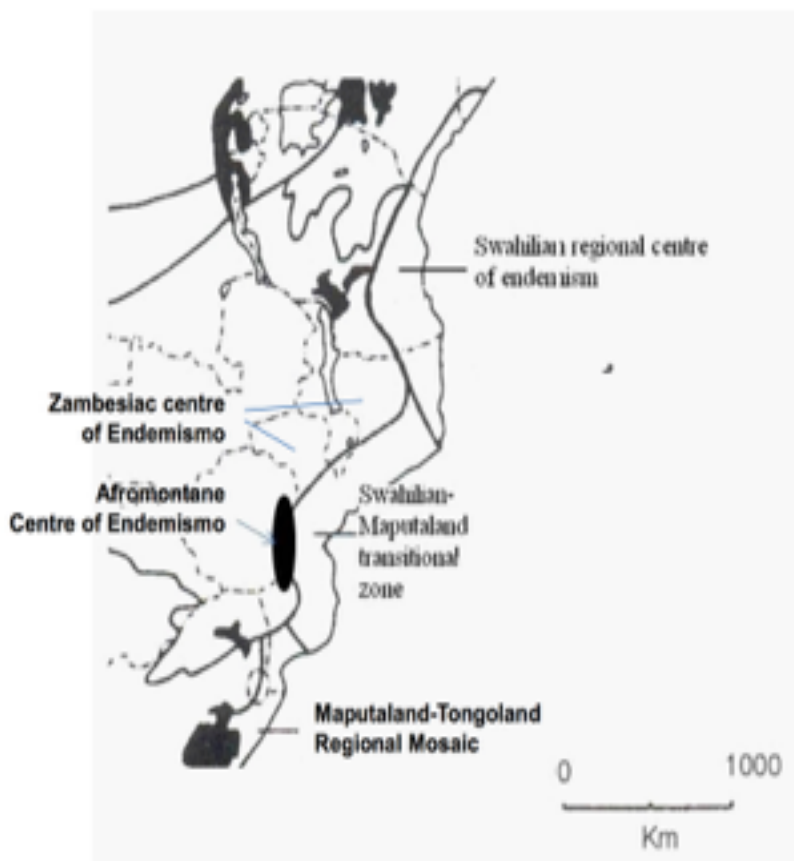


Figure 1: The phytogeographic areas of Mozambique (adapted from White, 1983 and van Wyk and Smith, 2001).

In terms of species of terrestrial fauna, the number is estimated at 4.271, of which 72% are insects (3.075 species), 17% are birds (726 species), 5% are mammals (214 species), 4% are reptiles (171 species) and the remaining 2% (85 species) are

amphibians (MICOA, 2003). According to the census of wildlife conducted in 2008, there are four main regions where the richness of wildlife is particularly high, namely: (i) *North Zone* (Niassa National Reserve, Chipanje Chetu Safari area and vicinity), where there are huge populations of buffalo, eland, impala, wildbeest and zebras. Three sub-species of large mammals are endemic in this region, such as *Equus burchelli* subsp. *boehmi* (Zebra), *Connochaetes taurinus* subsp. *johnstonii* (blue wildbeest of Niassa) and *Aepycerus melampus* subsp. *johnstonii* (*impala johnstonii*); (ii) *Central Zone* (Gorongosa National Park, Marromeu National Reserve and coutadas 10, 11, 12 and 14); and (iii) *South Zone* (Complex Limpopo-Banhine-Zinave and the Maputo Special Reserve). There are at the national level, 671 bird species, of which 29 are endangered and endemic. There are 16 *Important Bird Areas* (IBA) because of their high diversity and endemism, of which 2 are marine and the remaining terrestrial (representing an area of 1.708 million ha).

Table 3. biomes, ecoregions and their state of conservation in Mozambique (Extracted from the *Fifth National Report on Biological Diversity in Mozambique*).

Biomes	Ecoregions	Conservation State
Arid and Semi-arid forest	Mosaico f coastal forests of the south of Zanzibar-Inhabane	Critical
	Mosaico of Maputaland costal forest	Critical
Tropical and subtropical rangelands, savanas, thicket and woodlands	Shrub mopane of the Zambeze	Considerably stable
	Oriental Shrub Miombo	Considerably stable
	Southern Shrub Miombo	Vulnerable
	Shrub thicket of Southern Africa	Endangered
Floodplains and savanas	Zambezi flooded Savanas	Critical
	Zambeze Floodplains	Considerably stable
	Hallophytes of Makgadikgadi	Considerably stable
Mountain Grasslands and Thicket	Mosaic of forest and grasslands of the Rift montane	Endangered

Mangroves	Mangroves from of the Oriental Africa	Critical
	Mangroves of Southern Africa	Endangered

b) The Agrarian Biodiversity

The agricultural and livestock ecosystems in Mozambique are quite diverse and supported by a variety of agro-ecological conditions distributed in 10 areas (Figure 2, PROAGRI, 1996). The R4-R10 are regions of greater diversity and productivity for agriculture and forestry, while the regions R1-R3 have the potential to livestock development.

Mozambique has a large range of local crop varieties, wild relatives of crops, livestock species and wild species with food interest. There is a wide range of cultivated plants covering food crops (cereals, roots and tubers, beans, vegetables and fruit) and cash crops (cotton, cashew). As for food crops, maize, cassava and cowpea are the most common crops grown in the country. Mozambique shares with other SADC countries, the bean diversity center and records the occurrence of local crops such as sorghum, millet, naxenin, watermelon, among others. Other native species as n'cana, tseke and native fruits are widely used for food, thus contributing to diversify the diet of local communities.

In terms of biodiversity conservation, little attention has been given to these systems, while recognizing their ecological and socio-economic importance. It should be noted that the investment has been made by the Government of Mozambique (GoM) in the development and dissemination of improved varieties of major food crops in the country (emphasis should be given to the maize, cassava, beans, sweet potato and rice), which contribute to increase agricultural productivity but may affect biodiversity. Thus the goM has carried out some activities to increase the agrarian biodiversity in order to supply the needs of samllholder farmers and increase resiliency and adaptation to climate change. Some of these activtiesa are: harvesting, conservation and characterization of genetic resources. For instance, the IIAM has about 2.252 germplans of crops in the country, but the national patrimony is still sub-represented.

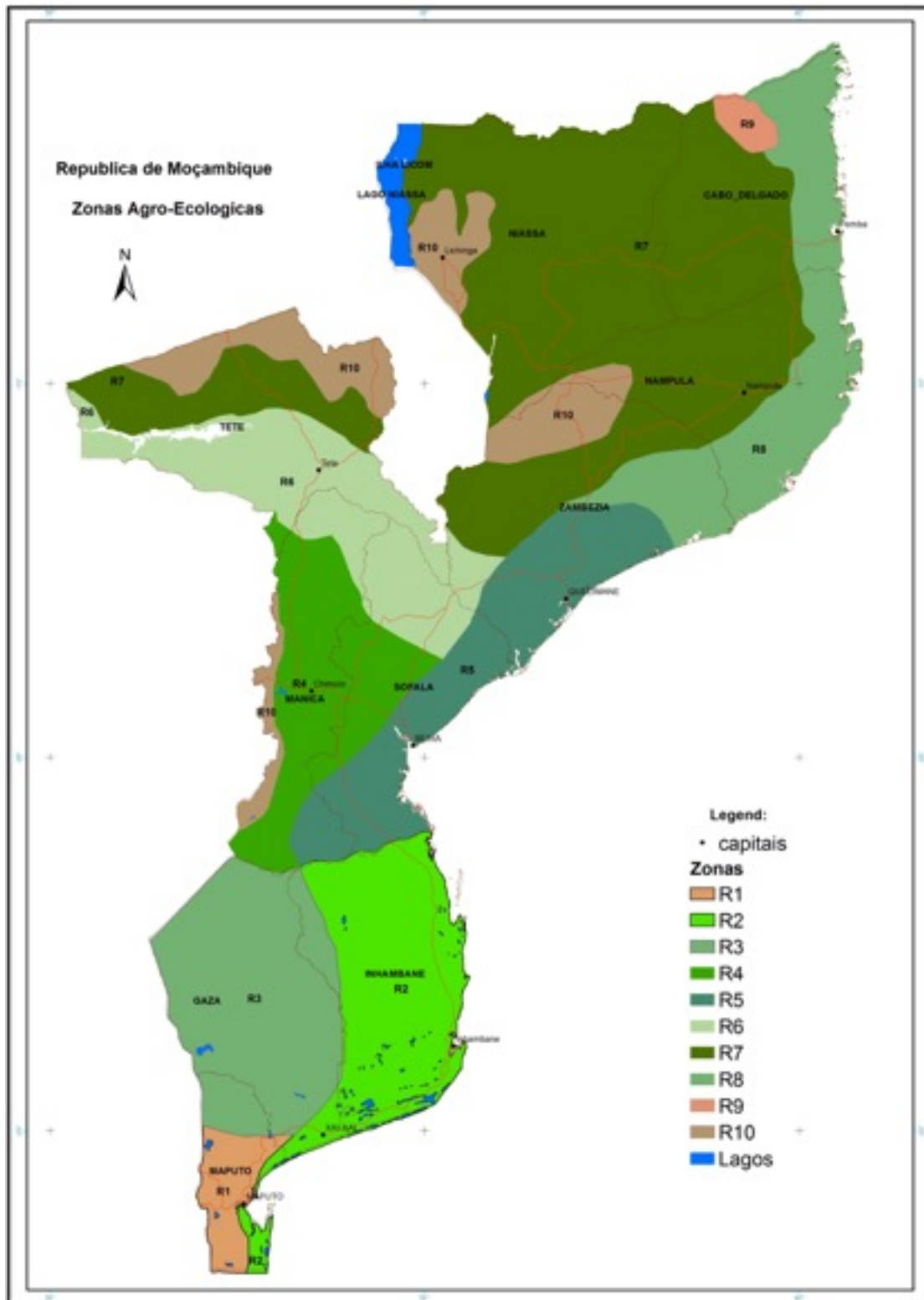


Figure 2: Agro-ecological zones of Mozambique.

LEGEND TO FIGURE 2:

Agro-ecologic Zone	Soil type/precipitation (mm)	Production System
R1: Interior of Maputo and south of Gaza	Soils: sandy to silty/Precip: November-March (570 mm)	Maize/Cassava/livestock
R2: Coastal zone south of Save River	Soils: sandy with aluvial soils. Precip: November-March	Maize/cassava/ gorundnuts/cashewnuts/ rice/sweet-potato.
R3: Center and north of Gaza and West of Inhambane	Soils: sandy. Precip: November-February (400-600 mm)	Millet/sorghum/livestock/maize
R4: median altitude of central region	Soils: heavy and light. Precip.: November-March (1.000-1.200 mm)	Maize/millet/sorghum/cassava
R5: Low altitude áreas of Sofala and Zambézia	Soils: Sandy and heavy (fluvisols and vertisols). Precip: November-May (1.000-1.400 mm)	Maize/millet/sorghum/cassava rice/cashewnut/cotton
R6: Semi-arid region fo the Zambeze valley, south of Tete	Soild: heavy sandy, Precip: November-March (500-800 mm)	Millet/sorghum/maize/livestock
R7 : Median altitude of Zambézia, Nampula, Tete, Niassa and Cabo Delgado	Soils: sandy and clayey/precip: November-May (1.000-1.400 mm)	MilMaizeho/millet/cassava/gorundnuts/ cashewnuts
R8: Coastal areas of Zambezia, Nampula e Cabo Delgado	Soils: Heaby sandy (fluvisols and vertisols)/Precip: November-May (800-1200 mm)	Cassava/millet/rice/cashewnut
R9: North of Cabo Delgado –Mueda mountain	Soils: Silty to sandy/precip: December-March (1.000-1.200 mm)	Maize/millet/peas/cassava/sesame/ cashewnut
R10: High altitudes of Zambézia, Niassa, Angónia and Manica	Soils: Ferrasoils/Precip: November-March (>1200) mm	Beans /potato/maize/millet

c) Coastal and marine biodiversity

The extent of the Mozambican coast is 2.770 km, divided into three major natural regions, particularly the coast of corals, swampy coast and coast of parabolic dunes (Figure 3). Coral reefs cover about 1.860 km² along the Mozambican coast (Spalding et al., 2001). Most are concentrated in the North coast of the country, where they appear almost continuously since the Quirimbas Archipelago Islands to the First and Second Islands (Rodrigues et al., 2000). Have been identified to date about 194 species of coral (Spalding et al., 2001).



Figure 3: The three main natural regions of the Mozambican coast.

Mangrove forests cover an area of 357.000 hectares (Marzoli 2007), located mainly in the deltas and estuaries of major rivers. South of the River Save the mangrove occurs extensively in Morrumbene estuary from Inhambane Bay, the Limpopo River estuary and the Bay of Maputo (including Inhaca Island) (Barbosa et al., 2001). The mangrove of the Zambezi delta covers approximately 180 km of the coastline, and in some sections extends up to 50 km inland. The mangrove of the northern region extends from Angoche to the Rovuma river. Have been identified nine species of mangrove in Mozambique.

The seagrass meadows cover an area of 439 km², and generally occur in the intertidal zone. The most important sites for the conservation of this ecosystem and associated species are the Quirimbas Archipelago, Bay Fernão- Veloso, the Bazaruto Archipelago, the island of Inhaca and Ponta do Ouro. There are in Mozambique 13 species, of which one (*Thalassodendron leptocaulis*) is considered a new species and occurs only in rocky habitats of Mozambique and northern South Africa (Duarte et al., 2012).

In terms of marine species, Mozambique has considerable diversity with emphasis on: (i) all of the five species of sea turtles in the Indian Ocean; (ii) 18 species of marine mammals, seven species of dolphins, 8 of whales, 2 of seals and 1

species of dugong; (iii) 2.626 species of sea fish (Hoguane and Pereira, 2003), with 800 species associated with coral reefs (Pereira, 2000), 92 cartilaginous fish (Fisher et al 1990;. Froese and Pauly, 2003); (iv) 1.363 species of molluscs, crustaceans including (shrimp, crab, lobster and crab hermit) (Hoguane and Pereira, 2003).

d) Interior waters biodiversity

Mozambique has aquatic ecosystems of recognized national, regional and international importance, among which the Niassa Lake and the Zambezi Delta are the most obvious examples. The main types of aquatic and wetland ecosystems are the rivers and their riparian zones (about 100 river basins covering more than 50 km²), deltas, natural lakes, artificial lakes created by dams, ponds and marshes. The main natural lakes are Niassa (shared with Malawi and Tanzania) and Chiuta (shared with Malawi). Cahora Bassa, Chicamba Real, Massingir, Lebombo, Macarretane and Chipembe are artificial lakes created by dams, but are also important from a biodiversity point of view.

Lake Niassa is the most diverse aquatic ecosystem of the country, rich in rare species and habitats. It has over 1.000 species of fish, of which about 700 are endemic, especially cichlids (Ribbink et al., 1983). The lake was declared as a *Ramsar* site in 2011 because of its international importance as aquatic habitat.

Lake Cahora Bassa is the largest artificial lake in Mozambique, with an area of 2.600 km², about 246 km long, maximum width of 39,8 km, and average depth of 18,5 m (Mafuca, 2000). The Kapenta (*Limnothrissa miodon*), an introduced species, is the main fishery resource of this lake.

The complex Marromeu-Delta Zambezi is a wetland of international importance and was declared in 2009 as a *Ramsar* site for its ecological value as habitat for aquatic birds, including migratory (MICOA, 2009). Currently the complex is internationally recognized as an *IBA*. The Zambezi river and its tributaries are also home to hundreds of fish species, some endemic, including cichlids.

Coastal lagoons, swamps and marshes flooded in the rainy season, located behind the coastal dune system of the south of Mozambique are important aquatic ecosystems (Hatton, 1995; Hart & Boane, 2004). Over 100 of these lakes are among Vilankulo and Ponta do Ouro (MICOA, 2009). Some of the largest and most important for biodiversity, fisheries and tourism are the Lagoons of Bilene, Nhambavale, Quissico, Inharrime and Piti. All of them are important feeding and nesting places for birds.

3.2. Biodiversity conservation in Mozambique

a) *in-situ* Conservation

Recognizing the national and global value of biodiversity in Mozambique, the GoM has focused mainly on *in-situ* conservation strategies. So for the past five years the national network of conservation areas (CAs) increased substantially to include the ecosystems that were not previously represented, now representing about 26% of the country's surface. In this context, the only protected water area of freshwater was created, the Partial Reserve of Lake Niassa. Marine protected areas were also expanded with the creation of the Environmental Protection Area of the Primeiras and Segundas Islands and the Partial Marine Reserve Maputo - Ponta do Ouro. Some marine sanctuaries were also declared. In relation to terrestrial areas, was established Mágoè National Park and several game reserves. In terms of representativeness, the terrestrial, aquatic and marine ecosystems are adequately represented in the CA system, and most of the wealth of *hotspots* and species endemism is within this network, except for some mountain ecosystems, such as the Mabu, Chipirone and Namuli, despite their recognized value in terms of biodiversity (Alves and Sousa, 2009). In addition, although the nesting turtles hotspots are represented in the network of CAs, some are not protected, such as the Inhambane bay, recognized by the local occurrence of dugongo.

The connectivity between CAs is particularly important in the national context, considering that most of them are surrounded by land uses that are not always compatible with biodiversity conservation. Over the past 10 years there has been progress in the consideration of ecosystemic/landscape approach in the planning and creation of ACs. It has also seen progress in promoting connectivity between existing CAs, through the establishment of Transfrontier Conservation Areas (TFCA) covering terrestrial, coastal and marine, such as the Limpopo TFCA, the Lebombo TFCA and the Chimanimani TFCA, and the proclamation of the Futi Corridor as a protected area. The creation of buffer zones around parks and reserves in all ACs enables wider connectivity landscape, and prevents the conservation areas are managed as isolated islands. Additionally, CAs recently created, are extensive, so the connectivity within these areas is important to ensure the link between habitats / ecosystems that sustain populations at different times of the year, and ensure the viability of flora and fauna populations, in the long term.

The current situation of the CAs in the country reveals the need for a general review of the current state of biodiversity in these areas, their limits and their management systems in order to ensure a stronger partnership with local communities.

b) *ex-situ* Conservation

Biological diversity in Mozambique is also registered at the level of *ex-situ* conservation systems. The *ex-situ* conservation strategies include botanical gardens, arboreta, seed banks, in-vitro collections, semen banks, zoos and aquariums. There are currently three botanical gardens in the country [the Tunduru Garden, the Garden of the Department of Biological Sciences, EMU and the Garden of the Institute of Agricultural Research (IIAM)], which require better management and systematization. The only zoo that exists in the country is currently abandoned, and aquariums do not yet exist in Mozambique. The *in vitro* collections that exist in Mozambique are concentrated in section of roots and Tubercules of IIAM, and are intended to allow rapid multiplication, maintenance and safe distribution germplasm of cassava and sweet potato.

Seed conservation has been made by the *Plant Genetic Resources Centre*, *Forest Research Centre (CIF)*) and *Department of Animal Sciences*, all belonging to IIAM, *Faculty of Agronomy and Forestry (FAEF)* and several seed companies. The *Plant Genetic Resources Center* has at least 1.800 samples of germplasm covering 14 species of various crops (maize, rice, sorghum, cowpea, etc.). The CIF has seed collections of several native tree species (*Azelia quanzensis*, *Millettia stuhlmannii*, *Pterocarpus angolensis*, among others) and exotic (mainly *Pinus spp.* and *Eucalyptus spp.*). However seed of threatened or endemic species are not preserved. Similarly, no semen collections of endangered species of wildlife.

The country has germplasm banks and gene banks in the country, which include banana clones and existing citrus in the Umbelúzi Station, and at least 576 cashew clones across the country. However, these collections are not properly preserved, documented and evaluated.

Overall, the *ex-situ* conservation of biodiversity in Mozambique appears to be precarious, revealing the need for greater investment in resources, training, organization and improvement of existing collections, to ensure the conservation of genetic resources.

3.3. The value of biodiversity in Mozambique

In Mozambique, the biodiversity is the livelihood of more than 90% of the human population that depends on it, directly or indirectly, for food, health, housing, energy, among others. Additionally, biological diversity has a major role in the global climate balance. It also has a high value in the national economy, because ecosystems provide goods and services that contribute to the stabilization of rural and urban economies, nationwide. Thus, the value of biodiversity conservation should not be

dissociated from their socio-economic value, so this strategy and its action plan recognize this intrinsic association values.

In Mozambique, biodiversity values can be grouped according to the type of resources, in the following categories: (i) *forest resources* (timber and non-timber) and *wildlife*; (ii) *fisheries*; (iii) *agriculture and livestock resources*; (iv) *tourism resources*; and (v) *mineral resources*.

a) Forest and wildlife resources

Mozambique has more than 70% of its territory covered by forest ecosystems, of which about 50% is productive forests for wood production (Marzoli, 2007). The timber production was estimated in 2014 at 150.000 m³, representing an increase in 50.000 in relation to 2013 (<http://www.portaldogoverno.gov.mz/noticias/agricultura/fevereiro-de-2014/mocambique-vai-aumentar-a-producao-de-madeira-em-2014/>). The Agency for Environmental Research indicates that 93% of the volume from illegal logging is done unsustainably. The agency refers that if the current logging levels continue, the commercial stock will disappear in the next 15 years (EIA, 2014). Additionally the forests provide goods and services that support people's livelihoods as well as the local economies. For instance, 90% of energy consumed in the rural areas comes from firewood and charcoal. Moreover, more than 70% of the population extract from the forests several Woody products (e.g. building materials and wood) and non-timber products (e.g. fruits, roots, honey, wax, fauna, among others). The majority of these products are used for subsistence but less is known about its potential and level of utilization. Forests provide a range of products that sustain the lives of communities and the national economy.

The best known potential of Mozambican forests is the estimated timber production in 26.9 million hectares of commercially harvested land, and 640,000 cubic meters per year, the potential of commercial volume. Logging is concentrated in a few species, such as *Dalbergia melanoxylon* (ebony), *Millettia stuhlmannii* (panga-panga), *Pterocarpus angolensis* (umbila), *Combretum imberbe* (monzo), *Swartzia madagascariensis* (ironwood) and *Azelia quanzensis* (chanfuta), causing obviously a strong pressure on them. The planted forest area has increased sharply in the last 10 years and is currently estimated at between 60.000 and 70.000 ha, and the most planted species are of the genus *Eucalyptus* and *Pinnus* (Nube, 2012). The expansion of forest with exotic species has been the cause of conflict because of the threat they pose to natural biodiversity, in addition to conflict in land ownership to local communities. However, it is to recognize its economic value to the country.

Most of the national forests are associated with a considerable faunal diversity, which is very important for their tourism potential and socio-economic, to provide a

source of nutrition and income for most of the Mozambican population. However, due to anthropogenic factors such as poaching, fires, unsustainable exploitation of natural resources, agriculture expansion and human settlements, mining and development of infrastructures, some fauna species have decreased in abundance and its area of distribution have been reduced. Other species were extinct in the last 30 years.

b) Fishing resources

Mozambique has an extraordinary potential for fish production, derived from its coastal location, the occurrence of 25 major rivers with permanent water flows, and various bodies of inland waters and floodplains, which provide resources to people throughout the year. Artisanal fishing is of crucial importance, and fish products account for over 20% of the animal protein consumed by the population; in some cases the fish is the only source of protein. For example, on Lake Cahora Bassa artisanal fisheries and semi-industrial, kapenta and tilapia, is one of the main activities of the population.

In 2012, the national fish production was 208.000 tons, 10% of which originated in semi-industrial and industrial fishing, and 0.3% in aquaculture.

c) Agriculture and livestock resources

The agro-livestock systems are mostly (98%) family, small-scale (1-5 ha per household, average 1.1 ha / family) and subsistence with minimum use of machinery and other agricultural inputs (fertilizers, pesticides, irrigation, etc.).

Although the irrigation potential in the country is high (3.3 million ha) just 0,13% of this potential is being used mainly by the private sector (MINAG, 2010). In terms of crops, maize is at national level, the most important crop of the production systems, but other crops, such as cassava, beans, sweet potatoes and vegetables (cabbage, tomatoes, lettuce, onions, etc.) are also relevant. Apart of the low agricultural diversification, the family sector is characterized by high post-harvest losses due to limited investment in agro-processing and marketing. The country has some conservation agriculture initiatives (eg Manica Province), but on a reduced scale. However, this proves to be promising from the point of view of conservation and should be cataloged and disseminated.

Commercial agriculture is a growing sector in the country revealing promising for socio-economic development. The main crops in the commercial sector are rice, sugar, bananas, soybeans, cashews, coconut, cotton, tea, among others. However, there are still major challenges to improve the performance of this sector on a national scale, in particular, the allocation of land, so that does not compromise natural

ecosystems, environmental management, the involvement of the family sector, among others.

d) Tourist Resources

The vast extension of high scenic and natural beauty ecosystems make Mozambique a tourist destination. Among the main tourist destinations in the country are the beaches and islands across the 2770 km of coastline, and the CAs of the coast and inland. The major limitation associated with tourism in Mozambique is the weak capacity in infrastructure and technical terms, which reduces the attractiveness of tourists. On the other hand, the weak involvement of local communities in the management and participation in tourism activity (associated with limited capacity and local initiative) make tourism resources contributing to the well-being of a minority, corresponding to the private sector, mainly foreigner. However, there are some successful examples of community involvement in tourism activities, such as *Covane Community Lodge* in Massingir, in the buffer zone of the *Limpopo National Park* and the *Ndzow Camp* in Sussendenga in the buffer zone of the *Chimanimani National Reserve*.

e) Mineral resources

Mozambique is endowed with vast wealth in mineral resources, including coal, natural gas, mineral sands and oil reserves, while its geological diversity provides minerals and metals such as gold, uranium, titanium, coal and bauxite. The central province of Manica is the primary source of gold, copper, iron, bauxite among others. Since 2004 the production of the extractive industry recorded a remarkable growth, mainly explained by the kick-off of coal mining megaprojects and heavy minerals (Umarji et al., 2010). Although not directly considered a resource provided by biodiversity, mineral extraction is considered one of the main threats to local biodiversity (Chapter IV) because it leads to the removal of large areas of natural ecosystems, and to high levels of pollution. Artisanal mining (eg gold mining in Manica and Sofala) is certainly one of the activities that most endangers biodiversity, in that it is performed using unsustainable practices such as the use of mercury, deforestation and lack of rehabilitation plans.

It is important to recognize the economic importance of the mining activity and it is therefore considered in this strategy and action plan in order to find ways to reconcile with the biodiversity conservation actions.

f) Environmental control

The diversity of natural ecosystems in Mozambique must also be seen from the point of view of environmental regulation potential, and intangible benefits of biodiversity, which are often overlooked. The direct consequence is that these are not recorded in the national accounts, which hinders its economic assessment. Among the main environmental services of biodiversity, are the protection of soils against erosion, protection of water resources (quality and quantity), and purification of air through carbon sequestration. The latter is extremely important for mitigating the effects of climate change, and has been the focus of attention in the last 5 years in Mozambique as well as globally. In this context, the initiative *Reducing Emissions from Deforestation and Degradation* (REDD +) provides support to community initiatives for the protection and restoration of forest ecosystems, which contribute as carbon sink and at the same time provide economic returns to the communities by the sale of carbon credits to international markets, thus helping to alleviate poverty. However, this initiative is still in its infancy, given that the country is preparing in terms of methodologies and robust estimates for a proper evaluation and quantification of carbon.

Chapter IV: ANALYSIS OF MAIN THREATS TO BIODIVERSITY

The *Fifth National Report on Biological Diversity in Mozambique* identifies the main direct causes of the threat to biodiversity in Mozambique as the following:

- a) Loss and degradation of natural habitats;
- b) Overexploitation of certain species;
- c) Invasive species;
- d) Pollution or contamination of natural habitats or species; and
- e) Climate change.

Additionally there are several indirect causes, which together with direct causes have contributed to biodiversity loss and degradation. These include:

- a) limited knowledge and awareness about the values and potentialities of biodiversity;
- b) limited use of science for decision-making and to produce knowledge;
- c) Trends in demographic and economic growth and urban expansion;
- d) Non-planned expansion of the extractive industry, determining unsustainable patterns of resource consumption and use; and
- e) Deficiencies in legal and institutional framework.

Following is a brief analysis of direct causes and for each direct cause, the appropriate indirect causes are also analysed.

a) Loss and degradation of natural habitats

In Mozambique, the loss and degradation of natural ecosystems has been one of the main direct threats to biodiversity. The causes of this are mainly the extreme poverty in which most of the population lives, coupled with its high dependence on biodiversity, as discussed in section 3.3. In this context, human subsistence activities, such as land opening to agriculture, most often associated with fires, charcoal production and artisanal fisheries can be considered as the main causes of the direct loss and degradation of natural ecosystems. Agricultural practices currently used by most of the Mozambican population are rudimentary, and therefore unsustainable. For example, many farmers rely on river and streams banks and beds to the practice of agriculture during the dry season, or in drought years, which requires the removal and degradation of riparian, wetlands and aquatic ecosystems (eg the riverine forests, wetlands and pollution of rivers and streams). Pollution of aquatic systems, is also one

of the main causes of aquatic systems degradation. On the other hand, the accentuated human growth (2% per year, INE, 2007) associated with urbanization and the need to meet population needs, are also important risk factors. According to Marzoli (2007), the annual rate of deforestation in Mozambique is estimated at around 219.000 hectares per year, corresponding to a 0,58% rate of change for the country, which means that the country loses between 45.000 to 120.000 ha of forest/year. Thus, the natural forest cover area reduced in the last few years is estimated at about 40 million hectares (FAO, 2010, cited by Siteo et al., 2012). With the strong growth of commercial agriculture and forest plantations of exotic species, it is expected to increase pressure on natural ecosystems in the coming years, especially around the main development corridors such as: the Beira Corridor (Manica and Sofala Provinces) and the Nacala Corridor (Niassa, Zambezia ans Nampula Provinces).

As discussed earlier, the energy sector through firewood and charcoal production is highly relevant in the Mozambican economy, but given the current production systems, this activity causes degradation of important natural ecosystems, including mopane woodlands, miombo woodlands and mangroves. Examples of the resulting degradation of this activity can be seen all over the country with emphasis on the production of charcoal in Mabalane, in Gaza province, the Beira Corridor and the Nacala Corridor, which are the major channels of distribution, and therefore charcoal production.

The economic development of Mozambique, based on the rapid growth of the industry (coal, gas, oil, heavy minerals, etc.) and infrastructure (roads, bridges, railways, etc.) may also represent a major threat to biodiversity due to the loss and / or reduction of natural habitats. Main centers of mining development in the country are: Tete Province (coal) and Cabo-Delgado (oil and gas).

It is therefore important that the accelerated socio-economic development of Mozambique, is accompanied by coordinated and planned actions to minimize the loss of biodiversity, or compensate for its loss, to ensure a net gain (or at least no net loss) of biodiversity in the development process.

b) Over-exploitation of certain species

The *Fifth National Report on Biological Diversity in Mozambique* examines, in detail, the over-exploitation of certain species, most notably:

1. The pressure over some (few) forest species of commercial value (eg. the level of exploitation of *Combretum imberbe* (mondzo) is 100% above the maximum allowable annual cut). This leads to the need for diversification of timber species (see section 3.3. for details on forest resources).

2. The species of mangrove are sought due to its calorific power to meet the energy needs of the inhabitants in coastal areas. Additionally, its durability increases the demand to meet the construction needs.

3. The species that provide charcoal, such as *Colophospermum mopane* and *Combretum imberbe*, in Mabalane; *Netwonina buchannanni* in Matutuine; are highly pressured, with considerable decrease in the abundance of these species.

4. Poaching mainly for rhino and elephant, to acquire trophies of international importance, has led to a reduction in the populations of these species, and is currently one of the national priorities.

5. Demand for wet areas for the practice of agriculture results in immediate ecological alteration of ecosystems, which undermines the species that depend on them for their existence. Particular focus is given to species of migratory birds that depend on wetlands, but also species of plants and animals dependent on these habitats.

6. Bycatch by trawls and other rudimentary methods of marine mammals.

7. Capture of sea turtles to serve as food, crafts and jewelry, and destruction of their nesting habitats due to the movement of vehicles on the beaches.

c) Invasive species

Several invasive species, including terrestrial aquatic plants, insects, and birds were introduced in Mozambique over the years, most of them in a deliberate manner for commercial (*Eucalyptus* and *Pinus*), agricultural, livestock and for agro-forestry systems purposes (*Leucaena leucocephala*, *Azadirachta indica*, among others), ornamental (*Lantana camara*), pet (*Corvus corvus*, the indian crow), and even for conservation (eg the casuarinas plantations along the coast) (MICOA, 2007). Some species introduced do not cause damage and are important economically, socially and are environmentally friendly, but other cause imbalances to ecosystems, resulting in extinction of other species and gradually reduced genetic diversity by hybridization. Among these plants are the water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), salvinia (*Salvinia molesta*), red water fern (*Azolla filiculoides*), parrot feather (*Myriophyllum aquaticum*), lantana (*Lantana camara*) are the most widespread in the country causing the greatest impacts on aquatic and terrestrial ecosystems. It is noted, for example, the invasion of these species in some river basins, such as the Incomati, Inhanombe and Shire by aquatic plants (*Salvinia sp.* and *Eichornia sp.*) and the basins of the Limpopo and Zambezi rivers for fish species are one of the causes of reduced water availability and navigation difficulty.

The records on the migration routes, occurrence, distribution and impacts of invasive species is very scarce in Mozambique, resulting in poor knowledge of the real threats they represent. Thus, the actions set out in this strategy aim to considerably improve the knowledge on these species and initiate control protocols and eradicate them.

d) Pollution or contamination of natural habitats or species

Pollution and contamination of natural habitats or species in Mozambique are still unknown, although four types of pollution are formally recognized: (i) *atmospheric*; (ii) *edaphic*; (iii) *aquatic*; and (iv) *marine*. However, for other pollution groups such as noise, aesthetics and luminous there is a total absence of information for Mozambique.

According to Costa and Soto (2012), the estimates of the costs of water and air pollution represent about 260 million USD per year (or 70% of the total cost of pollution in Mozambique), representing a strong impact on depreciation of human capital in the country, in addition to the direct implications for biological diversity.

The *Fifth National Report on Biological Diversity in Mozambique* addresses in detail the different types of pollution, including the main causes of which the industrial and urban expansion are reported as the main ones. In the context of air pollution it is important to consider the indoor pollution derived from the use of wood fuel indoors for the majority of the rural population. Outdoor pollution, mainly from the automotive industry (estimated at 350.000 vehicles, 57% of which in the City of Maputo), manufacturing industry, mainly around the major urban areas of Matola, Maputo and Beira, and open mining, especially in the provinces of Tete, Manica and Zambezia (resulting in the emission of pollutants - carbon, sulfides, sulfur and dust). There are no records of the resulting air pollution levels of the industry and manufacturing, but it is estimated to be, sufficiently high to interfere not only with human health, but also with biodiversity conservation. Considering the characteristics of the farming sector, the family based production system, there is potential for the emission of air pollutants mainly greenhouse gases, from farming activities due to the widespread practice of fires, which is estimated to emit 5-10 ton CO₂/ha (Nhamusua et al., in prep.). Another potential for air emissions is the livestock production, from livestock production (methane emission from manure). The latter, though little developed in the country, has the potential to grow and may eventually contribute significantly to pollution levels. Similarly, the expansion of rice cultivation areas in Zambezia and Gaza can further help raise methane emissions.

Records of edaphic, aquatic and marine pollution are scarce but reveal that the poor management of solid waste and wastewater can be the main causes of pollution.

Given the low utilization of agricultural inputs (fertilizers, pesticides, etc.) and the weak livestock development, this sector does not contribute significantly to aquatic and edaphic pollution. The extractive and manufacturing industries represent potential for pollution of soil and water, but the proper implementation of environmental management plans can minimize this effect.

e) Climate change

The details regarding the effects of climate change on the biodiversity in Mozambique are presented in detail in the *Fifth National Report on Biological Diversity in Mozambique*.

Chapter V: BIODIVERSITY STRATEGY: VISION, MISSION, GUIDING PRINCIPLES, STRATEGIC OBJECTIVES AND GOALS

This document presents a new policy orientation in relation to the NBSAP of 2003-2010 in order to contribute to counteract the current trend of loss and degradation of biodiversity in Mozambique. This strategy seeks to ensure that in resilient and healthy ecosystems, sustainable use of its components and the benefits generated from its use contribute to sustainable national development.

The new strategy is based on a long-term vision (20 years), and on a mission designed to respond to national challenges in ensuring that the benefits from the sustainable use of biodiversity effectively contribute to the development of the country through the eradication of poverty. The principles that support the operations on biodiversity and the strategic objectives defined herein are in accordance with national priorities.

5.1. Vision

The national vision on biodiversity is defined as:

"In 2035, the ecological, socio-economic and cultural value of biodiversity in Mozambique will contribute directly to improving the quality of life of Mozambicans, derived from its integrated management, conservation and fair and equitable utilization".

5.2. Mission

To achieve the proposed vision, our mission is defined as:

"To ensure the conservation of biodiversity through integration, training, financing, and strengthening of strong partnerships between the different sectors of society."

5.3. Guiding principles

To achieve the vision and mission, this NBSAP will be guided by the following principles:

Principle 1: National Heritage

National Biodiversity is a natural heritage with intrinsic values, and should be used sustainably for the benefit of the Mozambican population to improve their living conditions.

Principle 2: Equitable sharing

All stakeholders have a responsibility to contribute to the conservation of biodiversity and ensure sustainable use and equitable sharing of its components, including genetic resources.

Principle 3: Participatory Decision-making

Decision-making processes should be participatory and should involve various stakeholders at all levels, including local communities and vulnerable groups, so that access to information on biodiversity should be guaranteed.

Principle 4: Adaptive management

An ecosystem approach based on adaptive management principles are critical for biodiversity conservation in the context of global climate change.

Principle 5: Payment

Payment for the goods and services from ecosystem should be promoted and established as a corporate and development responsibility.

Principle 6: Integration in planning

The integration of aspects of biodiversity conservation in national planning process is crucial to ensure the sustainable development of Mozambique.

Principle 7: Management and Environmental Planning

Biodiversity conservation, sustainable use and benefit-sharing should have primary relevance in the instruments of environmental management and planning, including *Environmental and Social Impact Studies*.

Principle 8: Traditional Knowledge	Traditional knowledge and practices of use and conservation of biodiversity should be respected, preserved and protected, and their access be promoted in line with the national legal framework and customary norms.
Principle 9: Dissemination of information	The dissemination and sharing of information on biodiversity must be ensured for all sectors of Mozambican society, including local communities and vulnerable groups, without prejudice to the right of certain information protection under the national law.
Principle 10: Bilateral and multilateral cooperation	Cooperation related to the biodiversity should be promoted at national, sub-regional, regional and international.
Principle 11: Synergies	The consistency, harmonization and coordination of all policies related to biodiversity, intra- and inter-sectoral, should be secured.

5.4. Strategic Goals

In accordance with the *Global Biodiversity Strategy* and the national consultation were prioritized four strategic objectives (areas of focus) including:

Strategic Objective	Description
A	Reducing the direct and indirect causes of degradation and loss of biodiversity.
B	Improve the status of biodiversity by preserving the diversity of ecosystems, habitats, species and genes.
C	Improve the benefits sharing from biodiversity and ecosystem services for all sectors of the mozambican society.

D

Enhance implementation through participatory planning, knowledge management and training.

JUSTIFICATION OF STRATEGIC OBJECTIVE A

REDUCE THE DIRECT AND INDIRECT CAUSES OF DEGRADATION AND LOSS OF BIODIVERSITY.

This objective aims to reduce the direct and indirect causes of loss and degradation of biodiversity analyzed in Chapter IV.

To reverse the current situation, there is a need for, *inter alia*, a change of attitude of stakeholders, from local to national, but also international. This change will allow the adoption of policy options and practices that promote biodiversity conservation. Although a change of attitude requires a relatively long period, the focus in the short term, should be in improving knowledge on biodiversity, and access to information at all levels. The production of knowledge should be targeted in order to get an understanding as complete as possible of the current state of biodiversity and cause-effect relations which allow the definition of compensation measures for the loss of biodiversity areas, and appropriate practices for sustainable use of biodiversity. It is also crucial to survey and subsequent filling up the gaps in the legal and institutional framework, especially with regard to strengthening their implementation and operability.

JUSTIFICATION OF THE STRATEGIC OBJECTIVE B

IMPROVE THE STATUS OF BIODIVERSITY BY PRESERVING THE DIVERSITY OF ECOSYSTEMS, HABITATS, SPECIES AND GENES.

The main justification for this objective is to respond to the consequences of human and natural pressure, mainly affecting connectivity and representativeness of ecosystems, habitats, species and genes. These pressures can reduce the resilience of ecosystems, breaking its stability and function and, consequently, loss and extinction of species, goods and services provided by ecosystems.

To address these consequences, the effort should be concentrated on prevention and recovery measures. In terms of prevention should ensure greater representativeness and connectivity of ecosystems, habitats, species and genes within

the national protected areas system. The connectivity between ecosystems is extremely important for resilience to several factors among which climate change. In Mozambique, conservation areas are not generally connected and many of them are surrounded by forms of land use incompatible with the conservation of biodiversity. So there is a need to adopt a holistic approach to planning and management of conservation areas, putting emphasis in local communities' engagement. In terms of rehabilitation, attention should be on restoration of degraded ecosystems and threatened or endangered species. For the latter case, the revitalization of existing *ex-situ* conservation strategies in the country should be a priority.

JUSTIFICATION OF THE STRATEGIC OBJECTIVE C

IMPROVE THE BENEFITS SHARING FROM BIODIVERSITY AND ECOSYSTEM SERVICES FOR ALL SECTORS OF THE MOZAMBICAN SOCIETY.

This objective is based on the fact that Mozambique has determined that its development should be based on the exploitation of its natural wealth. Access to biological resources in Mozambique is set by law, which recognizes that natural resources provide goods and services necessary for the survival of humanity. The access, sharing and use of these resources should be made so that human activity does not pose a risk to its maintenance.

Ensuring the socio-economic benefits from biodiversity requires the definition of national budgeting innovative approaches and accounting systems on biodiversity to indicate the contribution of biodiversity for development, and supporting investment in biodiversity. Some of the priority activities should include the institutionalization of a national payment system for environmental services, including intangible services such as carbon, climate change mitigation, cultural values, etc. In addition, the effective implementation of the Regulation on Access and Benefit Sharing (ABS) generated from the use of biological and genetic resources and the associated traditional knowledge, work as a mean to improving the lives of local communities as knowledge holders and contributing to funding biodiversity conservation actions.

JUSTIFICATION OF STRATEGIC OBJECTIVE D

ENHANCE IMPLEMENTATION THROUGH PARTICIPATORY PLANNING, KNOWLEDGE MANAGEMENT AND TRAINING.

Overall, there is a need to improve the integration of biodiversity issues in all sectors and in local government plans and budgets in order to strengthen the valorization of biodiversity. Improving public awareness of the social and economic importance of biodiversity, and improved community participation in biodiversity

management are crucial to the success of biodiversity conservation in the country. In addition, the framework for multisectoral coordination and collaboration needs to be substantially strengthened in order to ensure the sharing of information, data on biodiversity, coordinated implementation and monitoring between the various stakeholders. The development of national and multilateral partnerships remains a priority for biodiversity conservation.

The recognition of the needs related to biodiversity, differentiated by gender, is crucial in order to recognize the most vulnerable groups and to strengthen capacities for sustainable use of biodiversity.

5.5. Definition and justification of national targets and strategic actions

The achievement of the strategic objectives set for this NBSAP requires the setting of targets adjusted to the national reality, in order to achieve progress in the conservation of biodiversity and the equitable sharing of benefits arising from their use (Box 2). Figure 4 shows the interactive way national goals should be treated.

Box 1: National Targets for Biodiversity Conservation.

STRATEGIC OBJECTIVE A: Reduce the direct and indirect causes of degradation and loss of biodiversity.	
Target 1:	The latest, by 2020, increase by 30% the level of awareness of the Mozambican population about the values of biodiversity and the impacts that human activity can cause.
Target 2:	By 2020, there should be a better understanding of the value (economic, social and ecological) of biodiversity, in order to allow a better integration in the decision-making and management.
Target 3:	By 2025, adopt and effectively implement policies and legal instruments for preventing and mitigating the impacts of human activities likely to cause degradation of biodiversity.
Target 4:	By 2025, define ecologically sustainable systems for the production and consumption based on sustainable practices and adequate investment.
Target 5:	By 2035, reduce by at least 20% the area of critical ecosystems, or that provide essential goods and services under degradation and fragmentation.

Target 6:	By 2025, have at least 30% of habitats of endemic and/or threatened flora and fauna species with strategies and action plans for their conservation in place.
Target 7:	By 2020, catalog/systematize, disseminate and encourage sustainable management practices in agriculture, livestock, aquaculture, forestry and wildlife.
Target 8:	By 2025, reduce the pollution levels at critical locations and ecosystems by 20%, pollution.
Target 9:	By 2025, reduce in at least 10% the area of occurrence of invasive species and establish/implement strategies for managing the impacts.
Target 10:	By 2035, put at least 20% critically affect ecosystems by climate changes under adaptive ecosystem management.
STRATEGIC OBJECTIVE B: Improve the status of biodiversity by preserving the diversity of ecosystems, habitats, species and genes.	
T a r g e t 11A:	By 2025, evaluate and redefine 75% of current conservation areas, and include, formally, 100% of the afro-montane endemism centers (altitude > 1.500m) and up to 5% of marine ecosystems and mountain in conservation areas.
T a r g e t 11B:	By 2030, manage effectively and equitably, 50% of the protected areas.
Target 12:	By 2035, rehabilitate at least 15% of the degraded ecosystems /habitats, restoring their biodiversity and ensuring its sustainability, with a view to mitigating the effects of climate change and combating desertification.
Target 13:	By 2030, complete the characterization and cataloging the genetic diversity of cultivated plants and domestic animals and their threatened ancestors in natural habitats, including species of socio-economic and/or cultural value and defining strategies for their conservation.
STRATEGIC OBJECTIVE C: Improve the benefits sharing from biodiversity and ecosystem services for all sectors of the Mozambican society.	
Target 14:	By 2030, create and integrate the national accounts a payment mechanism for environmental goods and services to promote fair, equitable and sustainable use of biological diversity.
Target 15:	By 2025, knowing and strengthen the contribution of biodiversity to increase the stock of carbon in order to mitigate and adapt to climate change.

Target 16:	By 2020, implement national legislation on access and benefit sharing arising from the use of biodiversity and genetic resources.
STRATEGIC OBJECTIVE D: Enhance implementation through participatory planning, knowledge management and training.	
Target 17:	By 2020, the sectors involved in biodiversity issues must develop, based on national targets, sectoral goals, integrate them into sectoral plans, and start implement it.
Target 18:	By 2035, value and respect the knowledge and traditional uses of on biodiversity, in accordance with national legislation.
Target 19:	By 2035, strengthen the capacity of key stakeholders and improve the integration of gender issues, to enable the effective implementation of national targets.
Target 20:	By 2020, strengthen national and international partnerships and establish innovative mechanisms for financing and support biodiversity programs.

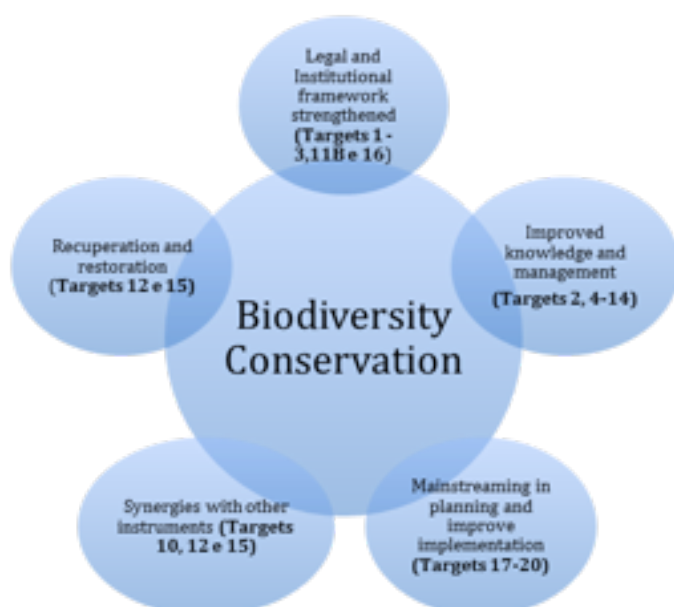


Figure 4: Synergies between national targets for biodiversity conservation.

Target 1: The latest, by 2020, increase bu 30% the level of awarness of the

Mozambican population about the values of biodiversity and the impacts that human activity can cause.

Justification: about half of the Mozambican population is aware, at various levels, even intrinsically on biodiversity values. However, knowledge and awareness of the effects that human activity can have on biodiversity are still incipient. Additionally, it is important to recognize the intrinsic relationship between local communities and biodiversity, continually threatened by poverty levels and lack of alternatives. It is important to recognize, existing initiatives undertaken in the area of environmental awareness by various government (eg MICOA through PECODA) and non-governmental institutions. In this sense, campaigns to promote a change of attitude should continue in order to cover a wider range of actors, including basic, secondary and higher education institutions, the media, local, district, and provincial and central levels government authorities, decision makers, NGOs and local communities. Particular attention should be given to private operators, who, guided by short and medium term objectives, may not be aware of the value and influence on biodiversity in the long-term.

Target 2: By 2020, there should be a better understanding of the value (economic, social and ecological) of biodiversity, in order to allow a better integration in the decision-making and management.

Justification: Currently, the mainstreaming of biodiversity concerns into national and local development strategies, as well as in the national accounts, is prevented by the lack of quantification of the economic, social and ecological value of biodiversity. Particular focus should be given to applied research oriented to the knowledge of the real value of key goods and ecosystem services (energy, wood, honey, wild fruits, microorganisms, protective services), the contribution of biodiversity to the country's development, and valorization of species less used. This should ensure, of course, an archive system and data management and efficient information, including an operational database on biodiversity. Every three years this database should be updated.

The creation and maintenance of communication mechanisms between researchers and decision-makers is important, so a communication platform should be promoted, through the *National Biodiversity Unit (NBU)*. This should have the function of strengthening dialogue and communication, and thus facilitate the mainstreaming of biodiversity in decision making.

Target 3: By 2025, adopt and effectively implement policies and legal instruments for preventing and mitigating the impacts of human activities likely to cause degradation of biodiversity.

Justification: prevention and mitigation of the impact of human activities associated with agriculture, mining, fishing, forestry, industry, and others represent severe threats to biodiversity, and should therefore be considered as a priority. This becomes particularly important in the national context in which the government's reliance in agriculture, mining, infrastructure development and tourism can have serious effects (irreversible) on biodiversity. It is thus imperative to implement measures to prevent and mitigate the impacts generated from these activities.

One way to prevent is to ensure that Environmental *Impact Assessments (EIAs)* for development projects consider actually biodiversity issues, including the aspects of compensation for their loss, when this is unavoidable. Simultaneously conducting *Strategic Environmental Assessments (SEAs)* of policies and programs becomes relevant. The monitoring of environmental management plans, control and inspection are also important to ensure compliance with existing policies and instruments.

Waste management (including pollution), at all levels, is extremely important from the point of view of biodiversity conservation. Thus, the development and implementation of waste management programs to prevent contamination of surface and ground water, soil and ecosystems associated with them, are crucial.

The loss of biodiversity due to economic development should be properly compensated, so setting the value to biodiversity offsets should be a national priority. Thus, actions aimed at determining compensation levels, and the definition of management measures and decision-making on these areas are relevant.

Target 4: By 2025, define ecologically sustainable systems for the production and consumption based on sustainable practices and adequate investment.

Justification: the main response to the current situation of unsustainable consumption and production should be the promotion of sustainable use practices in order to reduce pressure on biodiversity and allow development activities within the ecological limits. However, lack of knowledge about the capacity of key ecosystems limits the definition of a goal to achieve sustainable management practices. Thus, it is suggested that a permanent improvement of knowledge about the ecological limits of use, and on some management practices are identified, promoted and implemented.

Particular focus should be given to the use of plant and animal resources in key ecosystems in order to (i) increase production and income; (ii) promote the use of alternative species to reduce pressure on some species; (iii) support/leverage small and medium enterprises engaged in less pressure on biodiversity; (iv) promote the sustainable use of alternative energy, among others.

Target 5: By 2035, reduce by at least 20% the area of critical ecosystems, or that provide essential goods and services under degradation and fragmentation.

Justification: The critical ecosystems in terms of their conservation status (mangroves, coastal forest, miombo woodlands, forests and mountain grasslands, the flooded Zambezi savannas and marine ecosystems as marine corals and meadows) deserve special attention for reducing or removing the disturbances. In addition to these, it is important that degradation of the country's biodiversity *hotspots* (including some of the aforementioned ecosystems) is reduced.

Reducing the rate of degradation requires the development and implementation of management plans and, where not possible, conducting assessments with a view to establishing baselines for the monitoring the state of biodiversity and possible trends. Special attention should be given to non-protected areas where there are no formally management and monitoring activities. In these, particular attention should be given to promoting the involvement of people and/or groups directly dependent on ecosystems, through training and incentives for ecosystem conservation and restoration activities. This target is in parallel with Target 12.

Target 6: By 2025, have at least 30% of habitats of endemic and/or threatened flora and fauna species with strategies and action plans for their conservation in place.

Justification: species diversity of an ecosystem determines to some extent the resilience to changes and disturbances. At present, it is estimated in Mozambique, that about 1% of these species is known, described and efficiently conserved. Therefore, an improvement in the condition of existing species requires first an assessment and / or update of current status and the development of management plans and conservation strategies specific to each species. Improving the knowledge on these species should involve the collection of relevant material for their identification and detailed description, evaluation of existing stocks of the species in their natural habitat, as well as the possibility of improvement and maintenance of stocks through *in-situ* and *ex-situ* conservation measures.

Target 7: By 2020, catalog/systematize, disseminate and encourage sustainable management practices in agriculture, livestock, aquaculture, forestry and wildlife.

Justification: the socio-economic development of Mozambique is clearly dependent on the agricultural sector (agriculture, forestry, wildlife, livestock and fisheries), so that the promotion of sustainable management practices in this sector is extremely important. There are currently some (few) examples of these practices with emphasis on conservation agriculture in some areas of the center of the country, and the sustainable management of a few forest concessions. These practices have been carried out by private or local initiatives without a proper evaluation of levels of implementation and their effectiveness in conserving biodiversity. It is still limited to how these practices can be spread, and especially encouraged to promote greater involvement of different stakeholders in the adoption of good management practices. The definition High Conservation Value Areas in farms, forestry areas, etc. should be one of the focuses in the development of the agricultural sector in the country.

Target 8: By 2025, reduce the pollution levels at critical locations and ecosystems by 20%, pollution.

Justification: This target is in line with the target 3 that aims to promote the development and implementation of policies to prevent and mitigate the effects of the main economic activities. In fact, the expansion of those activities is recognized in various sectors such as commercial agriculture, mining, industry, development of infrastructure, urban sprawl, among others. Despite these investments are subject to the process of *EIA*, according to the Mozambican legislation, it is recognized the poor capacity for monitoring and inspecting the impacts of these activities and the limited incorporation of sustainable environmental management practices in their activities. Therefore, an improvement in knowledge of current soil pollution levels, atmospheric and aquatic (inland and marine) is crucial to the definition of concrete measures for pollution reduction. Large urban centers deserve special attention because of its rapid expansion, not always accompanied by appropriate practices for solid waste management and wastewater treatment. In this context, the promotion of a *green* behavior by urban populations is extremely important. In areas identified as polluted should be designed reduction and remediation plans of pollution, punishment measures (taxes and fines) and, where appropriate, promoted sustainable environmental management practices. International agreements with neighboring countries should be strengthened and implemented in order to reduce pollution in international waters.

Target 9: By 2025, reduce in at least 10% the area of occurrence of invasive species and establish/implement strategies for managing the impacts.

Justification: many species, including both aquatic and terrestrial plants, insects, and birds, have been introduced in Mozambique over the years, most of them deliberately. Some of these species cause imbalances on the ecosystems in which they occur, which may cause the extinction of other species and probably reduced genetic diversity. However, the studies that exist, such as knowledge of the ecology of these species and also the routes through which they enter the ecosystems are still incomplete for a better estimate of species invasion rate, which limits the development of eradication plans or control of alien invasive species. The difficulty is also associated with the limited legal framework that supports the activity on alien invasive species (there is a regulation but its implementation is limited).

Target 10: By 2035, put at least 20% critically affect ecosystems by climate changes under adaptive ecosystem management.

Justification: Mozambique is vulnerable to climate change because of (i) its long coastline; (ii) its geographical location in the intertropical convergence zone; (iii) its location downstream of shared river basins; and (iv) the presence of extensive areas with altitude below the average sea level. On the other hand, poverty, limited investments in advanced technology, and the fragility of infrastructure and social services, especially health and sanitation also contribute to vulnerability and low adaptive capacity. The consequences though still little known, include, among others, the change and / or loss of ecosystems (especially the vulnerable, such as mangroves, corals, sea meadows, mountain ecosystems, flooded grasslands, etc.) and, consequently, the well-being of people who depend on goods and services provided by ecosystems. It is therefore necessary to implement measures that reduce the negative impact of climate changes and enable local communities to adapt. These include among others, the use of sustainable practices in the use of resources (called for Target 7). In this context, the strategy and action plan should be implemented in conjunction with ENMC, which identifies strategic actions on biodiversity and ecosystems in the context of climate change.

Target 11A: By 2025, evaluate and redefine 75% of current conservation areas, and include, formally, 100% of the afro-montane endemism centers (altitude >1.500m) and up to 5% of marine ecosystems and mountain in conservation areas.

Justification: the coverage of the national system of protected areas is estimated at about 26% of the country, covering most terrestrial ecosystems, and a part of marine and coastal. However, most of the conservation areas were defined and enacted in the colonial era with the main objective of protecting wildlife and their habitats. However, after almost 40 years of national independence, some of these areas remain in the national system, without proper knowledge of their status to justify its maintenance as a protected area. Moreover, several other areas were created to include other ecosystems (especially marine and coastal). However, effective management requires a complete overhaul of the national system, through the knowledge of the main protected habitats, and their representation at national level, redefining the boundaries of some areas, and even the definition of the need to maintain certain protected areas in the national protected areas system. Particular focus should be given to forest reserves, all created in the colonial era to the conservation of forest species, but do not have received adequate attention, so it is not known at present, its true status. Should also be given special attention to biodiversity conservation issues in areas not formally recognized as conservation areas, but whose condition justifies. These are, for example, the mountain ecosystems, the miombo forests of Cheringoma-Marromeu complex as well as other formally explored areas (forest concessions, farm, pasture, etc.). In these, (community) management actions should be undertaken that promote the sustainable use of biodiversity.

Target 11B: By 2030, manage, effectively and equitably, 50% of the protected areas.

Justification: The national management system of protected areas in the country is currently weak, and although there is an improvement in the management structure in recent years, there has been the need for greater investment. Effective management requires the strengthening of human capacity and infrastructure, mobilization of financial resources, among others. On the other hand, it is recognized that, with the exception of the *Gile National Reserve*, the conservation areas in the country have human populations within its borders and surroundings. Thus, it is important to adapt the management systems to this condition, through greater involvement of local people in the decision-making process in the management of conservation areas.

The focus of management should be on improving the conservation of endemic and endangered species, through *in-situ* strategies (gene banks, sanctuaries and other) in critical and vulnerable ecosystems to climate change, and also the development of sustainable participatory management programs, in the recovery of

conservation areas (where appropriate) and the valuation of biodiversity in protected areas. An approach that should be considered is the design and implementation of access and benefit sharing schemes of communities living in conservation areas and their surroundings. This will promote bioprospecting, tourism and other uses within the conservation areas in order to contribute effectively to the conservation and improvement of the living conditions of the communities directly affected.

Target 12: By 2035, rehabilitate at least 15% of the degraded ecosystems/habitats, restoring their biodiversity and ensuring its sustainability, with a view to mitigating the effects of climate change and combating desertification.

Justification: Over the years, various ecosystems, including those located within the boundaries of protected areas, have suffered different levels of degradation and it is likely that this situation remains in the coming years if specific measures to rehabilitate ecosystems are not implemented. The rehabilitation of ecosystems ensures better adaptation to climate change, as well as helping to combat desertification (this is mainly evident in arid and semiarid areas of Mozambique). To reverse this situation it is important that degraded ecosystems are known (mapped and assessed for their status) to set priorities for the development of specific programs for rehabilitation of ecosystems. In this process, particular focus should be given to critical ecosystems (mangroves, corals, miombo, etc.), and also the areas of high human intervention (agriculture, forests, pastures, mining, urbanization and those under desertification). The implementation of rehabilitation programs should consider the ecological and socio-economic objectives, and the active participation of local communities and the decentralization of decision-making.

Target 13: By 2030, complete the characterization and cataloging the genetic diversity of cultivated plants and domestic animals and their threatened ancestors in natural habitats, including species of socio-economic and/or cultural value and defining strategies for their conservation.

Justification: This target aims to ensure greater attention to genetic resources, their values and their protection. Since the current knowledge on the subject is still limited, priority actions should focus on the inventory of species, genetic characterization and cataloging / mapping of threat levels, the critical points of agro-biodiversity, among others. For priority species, should develop and implement sustainable management programs, to prevent genetic erosion. Species with marketable potential should also be recognized, described and valued, and its cultivation promoted.

Target 14: By 2030, create and integrate the national accounts a payment mechanism for environmental goods and services to promote fair, equitable and sustainable use of biological diversity.

Justification: This target should be tackled together with the target 2. The economic value of biodiversity is important in accounting for ecosystem services, as a contribution to the country's development. This should focus not only on the resources that are currently most used, but also in those having marketing potential. Being an emerging approach it requires capacity building at the level of planning, as well as an improvement of the legal framework, not only in establishing appropriate mechanisms, but also in their enforcement (more details in target 16).

This goal also requires the development and implementation of a comprehensive program of valuation, able to generate information on the economic potential of biodiversity. In this context, the development of tools for accounting of biodiversity and promoting its marketing are of high importance.

Target 15: By 2025, knowing and strengthen the contribution of biodiversity to increase the stock of carbon in order to mitigate and adapt to climate change.

Justification: This target should be tackled together with the target 12 on the rehabilitation of ecosystems, since it seeks to ensure greater benefits derived from conservation efforts. The implementation of the REDD⁺ mechanism in Mozambique should be accelerated and strengthened in order to reduce losses due to climate change, and increase benefits of conservation and restoration of ecosystems.

With REDD⁺ mechanism will be established a carbon market. Although this international market is emerging, it is necessary the development of national methods or testing and adoption of international methods of assessment and carbon accounting for the different ecosystems. To this end, it is assumed that REDD⁺ pilot projects are developed and implemented, focusing on the ecosystems with potential to generate this environmental service (eg, mountain forests and biodiversity *hotspot*). It also envisaged the promotion of voluntary compensation mechanisms for the use of biodiversity by the private sector.

Target 16: By 2020, implement national legislation on access and benefit sharing arising from the use of biodiversity and genetic resources.

Justification: With the effective implementation of legislation on access and resources sharing, is intended to be guaranteed the compensation for the use of biodiversity, and valued the traditional knowledge and its contribution to improving the livelihoods of local communities. Although Mozambique has ratified the *Nagoya Protocol* and approved the *Regulation on Access and Benefit Sharing resulting from Genetic Resources and Associated Traditional Knowledge* (Decree 19/2007 of 9 August), there is still the need to adapt the instrument to respond fully to the Nagoya Protocol, and improve the implementation of this instrument in coordination with others who are relevant. The development of a mechanism for access and benefit sharing should be established, taking into account the targets 14 and 15 on the payment for environmental services. For this is important, among other things, empowering local communities and the private sector to promote their participation in compensation mechanisms from biodiversity.

Target 17: By 2020, the sectors involved in biodiversity issues must develop, based on national targets, sectoral goals, integrate them into sectoral plans, and start implement it.

Justification: This target aims to ensure that the priorities for biodiversity conservation, established in this strategy, are integrated into development strategies and sectoral plans of key sectors for the development of the country: (i) energy; (ii) mining; (iii) agriculture, forestry, wildlife; (iv) fisheries; (v) tourism; (vi) public works and housing; and (vii) water, and that the planning is carried out in a decentralized manner. This requires consistency with national targets and the revision of the strategies/sectoral plans in order to ensure effective mainstreaming of biodiversity in budgetary planning, and to ensure the implementation of projects and activities related to biodiversity conservation.

Target 18: By 2035, value and respect the knowledge and traditional uses of on biodiversity, in accordance with national legislation.

Justification: In conjunction with the target 16, this seeks to respect regarding to ownership of traditional knowledge and ensure its contribution to the improvement of local communities' livelihoods.

Target 19: By 2035, strengthen the capacity of key stakeholders and improve the integration of gender issues, to enable the effective implementation of national targets.

Justification: This goal aims to address the cross-cutting issues of training, capacity building and gender. Recognizes the need for strengthening national capacity to boost the role of sectors in achieving national targets by 2035. The target groups for training should include key government institutions, key productive sector / private, NGOs, local and traditional leaders, and organizations and community institutions.

To ensure the planning, implementation and full monitoring, it is important the generation of knowledge and the development of tools for integrating gender issues. This implies the collection and production of knowledge on how decision-making about biodiversity affects differently the needs of different groups and their livelihoods, the development of tools for integrating gender issues in national and sector projects and activities, the effective integration of gender issues in main legal instruments related to biodiversity and the possible use of opportunities of national reforms, such as REDD⁺, ABS, ENMC, etc. to integrate gender issues.

Target 20: By 2020, strengthen national and international partnerships and establish innovative mechanisms for financing and support biodiversity programs.

Justification: The partnership between the different stakeholders is central to the implementation of the activities identified in this strategy. This requires the creation of national and sectoral innovative strategies for resource mobilization and investment. For this it is important to develop plans to mobilize resources for biodiversity, mobilizing partners for the implementation, planning and budgeting that includes biodiversity, establishing benchmarks for budgeting and mobilizing investment in programs to conserve biodiversity, which are multilateral, bilateral and national, as required by decision X / 3 of the CBD COP-on resource mobilization.

Chapter VI: ACTION PLAN FOR BIODIVERSITY CONSERVATION

6.1. The logical framework for the development of the action plan

This chapter contains specific actions defined to achieve the strategic objectives and national targets within the defined time frame (2015-2035). The definition of actions followed the guiding principles of this strategy, thus considers the following:

- Strengthening of the Legal and Institutional framework on biodiversity;
- Improved knowledge on the functional relationships and processes inherent to ecosystems;
- Use of adaptive practices for rehabilitation and management of ecosystems;
- Strengthening the sharing of benefits;
- Implementation of management actions at the appropriate scale, taking into account proper planning and decentralization;
- Ensuring cross-sectoral cooperation and national and international partnerships.

This National Action Plan for the Conservation of Biological Diversity is divided into seven components:

1. Strategic Objectives
2. National targets
3. Priority actions for intervention
4. Timeframe
5. Performance indicators
6. Budgeting
7. Responsibility for implementation

6.1.1 Strategic Objectives

The strategic objectives set out in Chapter IV cover four priority areas of intervention:

- (i) Strategic Objective A (SOA): to reduce the direct and indirect causes of degradation and loss of biodiversity;

- (ii) Strategic Objective B (SOB): improving the state of biodiversity, preserving the diversity of ecosystems, habitats of species and genes;
- (iii) Strategic Objective C (SOC): enhancing the sharing of benefits from biodiversity and ecosystem services for all sectors of government and society; and
- (iv) Strategic Objective D (SOD): improve implementation through participatory planning, knowledge management and training.

6.1.2. Targets

The objectives set for this strategy will be possible if the 21 national targets outlined in Chapter V are met. These provide guidance for identifying procedures that allow counteracting the current situation of loss and degradation of biodiversity.

The action plan follows a flexible approach based on Guiding Principle 4 of the Adaptive Management, and pursues the option of an ecosystemic approach, with a view of improving knowledge and sustainable use of biodiversity. The targets also focus on the importance of strengthening national legal and institutional framework and the need to strengthen institutional capacity in planning and implementation of management and biodiversity conservation actions.

National targets are also a tool for the development of medium and large-scale projects, targeted to address the main challenges of biodiversity conservation in Mozambique.

6.1.3. Priority actions for intervention

For each national target priority actions have been identified, in a systematic way. However, they should not be considered exclusive, in that other actions may be inserted, but they have a medium to high priority in the national context, so that will allow to achieve the postulate of this strategy and action plan within the prescribed timeframe.

The actions are presented in a matrix (section 6.3), which allows effective verification of the time horizon, the performance indicators and the institutions responsible for its implementation, as well as their collaborators and budgeting.

6.1.4. Time horizon

The definition of a time frame for the measures defined in this Action Plan aims to be consistent with the global and national reality. Although the reference 2035 does not align fully with the postulate in the *Global Strategy 2011-2020* and the *Aichi Targets for biodiversity*, is the preferred option considering the delay in starting the review of the strategy and the national situation, in terms of human and institutional

capacity. In this context, the time horizon, and the amounts and percentages set out in the goals, taking as a reference the year 2017, as the period 2015 to 2016, is intended to create the fundamental basis for the implementation of the strategy, and therefore, from 2017 there will be sufficient knowledge and training, to ensure effective implementation of the postulated herein.

6.1.5. Performance indicators

The monitoring and evaluation of progress in the implementation of this plan are defined by a series of performance indicators. Thus, for each action set forth in this plan have been identified indicators which are intended to be SMART (*Specific, Measurable, Achievable, Realistic and Time-Targeted*). Therefore, the indicators were defined taking into account the national capacity for implementation.

6.1.6. Institutions responsible for implementation

The accountability of the various key sectors in prioritizing actions for the conservation of biodiversity (including private) is also important to the success of this Action Plan (Section 6.3). In this sense, the plan set out in this strategy recognizes the role of all national stakeholders in the effective achievement of the conservation and sustainable use of biodiversity. These actors were actively identified in terms of their mandates and areas of intervention in order to ensure their participation in the implementation of the action plan. Some of these actors were consulted and participated in the process of defining interventions postulated in this plan.

6.1.7. Mechanisms for Implementing

Implementation of the strategy and action plan, should follow a participatory process to include the different sectors of the Mozambican society especially the government, NGOs, local communities, private institutions, international and regional organizations, etc. Implementation mechanisms, monitoring, evaluation and reporting are defined in Chapter VII.

6.2. Synergies

This national strategy and its action plan can not be seen only as a single document, so its effective implementation depends on the synergies with other national plans, policies and programs that directly influence the conservation of biodiversity, sustainable use and benefit sharing. These synergies are:

- *Global Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets;*

- *Nagoya Protocol (ABS Regulations);*
- *National Strategy on Climate Change (ENMC);*
- *National Action Plan to Combat Drought and Desertification (in preparation);*
- *Ramsar Convention on wetlands;*
- *Convention on International Trade in Endangered Species (CITES);*
- *Convention on Migratory Species (CMS).*

6.3. Actions Matrix (Note: The year 2017 was taken as a reference for the definition of the targets- See section 6.1.4. Timeframe)

Priority Actions	Timeframe	Performance Indicators	Implementing institutions		Budget (x1.000 MT)
			Leader Institution	Collaborating institutions	
Target 1: The latest, by 2020, increase by 30% the level of awareness of the Mozambican population about the values of biodiversity and the impacts that human activity can cause.					
1.1. Enhance the implementation of the <i>Program on Environmental Education, communication and dissemination (PECODA)</i> about biodiversity.	2016-2018	1. Number of awareness programs (rádio Moçambique, Community rádio, TV, newspaper, meetings, etc)	MITADER	MASA, MIGECAS, MEF, ONGs, <i>Media</i> , MICTUR, MP, ME, MIREM.	800
1.2. Enhance mecanismos for implementation of biodiversity issues that are part of the <i>curricula</i> in the general education system.	2018-2019	1.2.1. Number of schools implementing activities related with biodiversity according to the <i>curricula</i> . 1.2.2. Number of teachers trained on issues of biodiversity.	MINEDH	MITADER, MEF	500

1.3. Promote the involvement of private sector in awareness campaigns and capacity building	2017-2020	<p>1.3.1. Number of programs led by the private sector.</p> <p>1.3.2. Number of public-private partnerships for capacity building and awareness raising.</p> <p>1.3.3. Investment value for capacity building supported by the private sector</p>	MITADER	CTA, NGOs, Private sector, FEMA, BIOFUND, Academic Institutions.	500
1.4. Implement public awareness campaigns on biodiversity (through leaflets, brochures, debates, seminars and other activities).	2016-2020	<p>1.4.1. Number of materials produced (e.g. leaflets, brochures, etc.).</p> <p>1.4.2. Number of events carried out.</p>	MITADE	MIGECAS, MEF, Academic institutions, NGOs, BIOFUND	600
1.5. Promote awareness campaigns with local communities through dialogues, debates, and involvement in specific conservation activities.	2018-2020	<p>1.5.1. Number of communities involved.</p> <p>1.5.2. Number of members of the communities involved, participating in awareness campaigns.</p>	Local Authorities/ NGOs	MITADER, MEF, Local Government.	1.000

Target 2: By 2020, there should be a better understanding of the value (economic, social and ecological) of biodiversity, in order to allow a better integration in the decision-making and management.

<p>2.1 promote research oriented to understand the state, value, causes of loss and measures for biodiversity conservation.</p>	<p>2015-2035</p>	<p>2.1.1. Document with research lines on biodiversity approved.</p> <p>2.1.2. Number of scientific publications and technical reports with specific information on biodiversity.</p> <p>2.1.3. Number of research projects on the socio-ecological value of biodiversity.</p>	<p>Research and academic institutions.</p>	<p>MITADER, MASA, MCTEST P</p>	<p>3.000</p>
<p>2.2 Enhance the taxonomic knowledge on biodiversity.</p>	<p>2015-2035</p>	<p>2.2.1. Number of floristic and taxonomic inventories carried out.</p> <p>2.2.2. Number of technicians capacitated in taxonomic research.</p>	<p>Research and Academic institutions</p>	<p>MITADER, MEF, MASA, MICTUR, national and international NGOs</p>	<p>4.000</p>
<p>2.3. Establish a national scientific platform between decision makers and researchers for dialogue and information sharing.</p>	<p>2015-2017</p>	<p>2.3.1. Platform for scientific dialogue established.</p> <p>2.3.2. Information tools produced by the scientific platform.</p> <p>2.3.3. Number of institutions/entities using information tools for decision-making and management.</p>	<p>MITADER, Research and Academic institutions</p>	<p>Private Sector, Governmental institutions, national and international NGOs</p>	<p>1.000</p>

2.4. Develop and implement tools for the economic valorization of the main ecosystem services and goods.	2019-2020	<p>2.4.1. Tools for economic valorization established.</p> <p>2.4.2. Number of projects for the valorization of biodiversity.</p> <p>2.4.3. Economic value of at least 3-4 main goods and services of the main ecosystems.</p>	MEF/MITADER	Private sector, academic and research institutions	4.000
2.5. To establish an information system for biodiversity (that includes a functional database for archiving and sharing information).	2017-2020	<p>2.5.1. Web based portal on biodiversity established and operational.</p> <p>2.5.2. Number and type of information available in the database.</p> <p>2.5.3. Number of <i>downloads/acceses</i> per week/ month/ year.</p>	MITADER	BIOFUND	500
Target 3: By 2025, adopt and effectively implement policies and legal instruments for preventing and mitigating the impacts of human activities likely to cause degradation of biodiversity.					
3.1. To Implement voluntary measures for compensation from biodiversity losses/reduction.	2020-2025	<p>3.1.1. Number of private companies and organizations implementing compensation measures.</p> <p>3.1.2. Number and type of compensations.</p>	MITADER	MASA, MICTUR, MIREM E, MOPH, BIOFUND.	500

<p>3.2. Update the Decree 45/2004 on EIA to include biodiversity issues, including mechanisms for compensation (<i>no-net-loss</i>) and mitigation.</p>	<p>2015-2035</p>	<p>3.2.1. Decree 45/2004 updated to include issues such as quantification of (residual) impacts, indirect impacts, adjustment of the EMPS to the real situation once the project is implemented and compensation and mitigation measures for biodiversity loss/reduction.</p> <p>3.2.2. Number of EIAs que incorporating compensation and mitigations measures.</p>	<p>MITADER</p>	<p>MASA, MICTUR, MEF, MIREM E, MOPH, BIOFUND</p>	<p>500</p>
<p>3.3. To develop mechanisms to assure impartiality in the EIAs, including independent revisions of EIA reports.</p>	<p>2016-2018</p>	<p>3.3.1. Imparciality mechanisms defined (eg. Peer Review mechanisms).</p> <p>3.3.2. Number of EIAs consultants selected by the Environmental institution.</p> <p>3.3.3. Number of EIAs peer-reviewed.</p>	<p>MITADER</p>		<p>500</p>

3.4. Capacitate the EIA consultants on impacts assessment and quantification.	2017-2020	3.4.1. Modules for training consultants developed. 3.4.2. Number of training events on impact assessment and quantification carried out.	Academic Institutions	MITADER	1.000
3.5. Update the Decree 67/2010 on the Environmental Standards.	2016	3.5.1. Decree 67/2010 updated to include compensations and penalties due to biodiversity loss. 3.5.2. Environmental Standards adjusted to the national situation.	MITADER	MASA, MT, MIREME, BIOFUN D	200
3.6. Intensify the inspection and control over the use of chemical pollutants according to the national and international regulations.	2018-2020	3.6.1. Number of inspections/controls and fines emitted.	MITADER		3.000
3.7. To implement waste management plans in villages, municipality and cities.	2016-2025	3.7.1 Number of waste management plans implemented at several levels. 3.7.2. Quantity (kg/Tons) of residues collected, treated and/or recycled annually.	MITADER/SDPI/Municipality	Municipalities, local communities and civil society.	1.000

3.8. To guarantee the implementations of waste management plans of development projects.	2017-2025	3.8.1. Number of waste management plans implemented correctly. 3.8.2. Number of inspections, controls and fines emitted.	MITADER	Private sector	400
3.9. Define and implement an inspection and monitoring program for waste treatment plants to guarantee their operation and rehabilitation.	2016-2025	3.9.1. Inspections and monitoring program approved. 3.9.2. Number of treatment plants inspected, rehabilitated and functioning. 3.9.3. Number of fines emitted.	MITADER	Private sector	2.000
Target 4: By 2025, define ecologically sustainable systems for the production and consumption based on sustainable practices and adequate investment.					
4.1. Establish the ecological limits of priority ecosystem goods and services.	2019-2025	4.1.1. Number and type of goods and services with ecological limits established. 4.1.2. Number and type of ecosystem assessed.	Academic and Research institutions	MITADER, MASA, MIREM E	3.000

4.2. Define the sustainable levels of extractions for the main ecosystem services (firewood, charcoal, honey, wood, building materials, hunting, agriculture, etc.)	2017-2025	4.2.1. Collection indices for 2 ecosystem services (wood and energy) defined.	Research and academic institutions	MITADER, MASA, MITUR.	5.000
4.3. Promote and support the alternative consumptions of new species and diversify varieties for marketing.	2017-2025	4.3.1. Number and type of new species promoted for consumption. 4.3.2. Number and diversity of varieties commercialized.	Academic and Research Institutions	MITADER, MASA, MIC	5.000
4.4. Promote and support small and medium enterprises that use less aggressive practices for biodiversity.	2016	4.4.1. Mechanisms to promote small and medium enterprises established (e.g. market and production incentives). 4.4.2. Number of small and medium enterprises that use sustainable production methods.	MIC	MINAG, MITADER, MICTUR, MIREM, BIOFUND,	2.000

4.5. Promote the utilization of alternative energetic techniques that are compatible with biodiversity conservation (e.g. gas, eficiente stoves, agro and livestock residues, etc).	2016	4.5.1. Type of alternative techniques promoted. 4.5.2. Number of families using new alternative energetic techniques. 4.5.3. Volume (m ³ /ha/year) of charcoal exploited.	MITADER, MIREME	MASA	2.000
4.6. Promote the sustainable use of biodiversity in key productive sectors (mining, agriculture, forests, tourism, energy, public work and housing) according to national and international regulations (e.g. ISO 14001).	2015-2025	4.6.1. Certification Systems for selected products defined. 4.6.2. Quantity of certified products that are commercialized.	MITADER	MASA, MOPH, MICTUR	3.000

Target 5: By 2035, reduce by at least 20% the area of critical ecosystems, or that provide essential goods and services under degradation and fragmentation.

5.1. Identify and characterize the degradation level of critical ecosystems or those providing essential goods and services.	2017-2025	5.1.1. Number of critical ecosystems/habitats identified and assessed.	Academic and research institutions	MITADER, MASA, MIREME	4.000
5.2. Develop and implement management plans for critical ecosystems or those providing essential goods and services.	2018-2025	5.2.1. Functional management plans implemented in at least 7 critical ecosystems or those providing essential goods and services.	MITADER and MASA.	Academic and research institutions, MIREME	4.000

<p>5.3. Create incentive mechanisms to the participation of local communities in activities of management and conservation of biodiversity.</p>	<p>2020-2035</p>	<p>5.3.1. Number and type of incentives defined (e.g. payment for environmental services, community conservation areas, environmental protection areas, etc.).</p> <p>5.3.2. Number of communities involved in activities of biodiversity conservation.</p> <p>5.3.3. Number of families and members of local communities involved in conservation activities.</p>	<p>MITADER, MASA</p>	<p>ONGs, MEF, MICTUR, MIREME.</p>	<p>2.000</p>
<p>Target 6: By 2025, have at least 30% of habitats of endemic and/or threatened flora and fauna species with strategies and action plans for their conservation in place.</p>					
<p>6.1. Establish and implement coordinated programs for the systematic assessment of the conservation status of endemic and endangered species.</p>	<p>2016-2018</p>	<p>6.1.1. Number of programs implemented.</p> <p>6.1.2. Number of species assessed.</p>	<p>Academic and research institutions</p>	<p>MITADER, MASA, MEF, MICTUR</p>	<p>2.000</p>

6.2. Identify and describe the Areas of Plant Importance (API)	2020-2035	6.2.1. Number of APIs identified and described	Research and academic institutions	MITADER, MASA, MEF	5.000
6.3. Disseminate the <i>Red data Book</i> on national flora and fauna.	2016-2018	6.3.1. <i>Red Data Book</i> updated and published in the internet. 6.3.2. Number of accesses and type of institutions accessing the <i>RDB</i>	MITADER, IUCN, ANAC	MEF, sector privado, BIOFUND	500
6.4. Establish and implement integrated management/conservation plans effectively for endemic and endangered species, (<i>in-situ</i> e <i>ex-situ</i> measures).	2020-2025	6.4.1. Number of <i>in-situ</i> conservation plans implemented. 6.4.2. Number of species conserved and managed sustainably. 6.4.3. Number of <i>ex-situ</i> conservation measures rehabilitated or promoted (e.g. Zoo, botanical gardens, gene banques, etc.).	MITADER, MASA	Local communities, National and international ONGs, academic and research institutions.	4.000
6.5. Establish a coordinated program for conservation and rehabilitation of endangered biodiversity.	2020-2025	6.5.1. Number of programs established. 6.5.2. Number of new <i>ex-situ</i> conservation centres established.	MITADER	National and International ONGs, local communities, academic and research institutions.	5.000

6.6. Develop and support the implementation of a coordinated strategy to combat the commercialization of products from poaching activities.	2015-2020	6.6.1. Strategy defined and approved. 6.5.2. Number of illegal commercialization cases notified, judged and fined.	MICTUR, MASA, MEF, MITADER	AT, MINT	3.000
6.7. Assess the conservation status of forest reserves and develop/redefine management or rehabilitations plans.	2018-2025	6.7.1. Number of forest reserves assessed. 6.7.2. Number of management plans approved and implemented. 6.7.3. Number of forest reserves rehabilitated.	MITADER	MASA, academic and research institutions.	4.000
6.8. Establish and implement management plans for marine resources and fisheries.	2016-2020	6.7.1. % of species or ecosystems with management plans implemented.	MIMAIP	MITADER, local communities, NGOs	3.000
Target 7: By 2020, catalog/systematize, disseminate and promote sustainable management practices in agriculture, livestock, aquaculture, mining, forestry and wildlife.					
7.1. To mainstream biodiversity issues in the territorial planning (in harmony with activity 5.3).	2017-2019	7.1.1. Number of territorial plans revised and updated. 7.1.2. Regulation of the <i>Territorial Planning Law</i> approved and implemented.	MITADER	Municipalities	1.000

7.2. Update and guarantee the implementations of the strategy to combat fires, through the mainstreaming of biodiversity.	2019-2020	7.2.1. National Action Plan updated and implemented. 7.2.2. Number of fire management and monitoring plans implemented. 7.2.3. Percentage of fire monitoring plans that mainstream biodiversity.	MASA, INGC	MITADER, local communities, NGOs	3.000
7.3. Establish and disseminate of conservation agriculture techniques.	2015-2020	7.3.1. Number of projects implemented and disseminated. 7.3.2 Number of small and medium farmers adopting conservation agriculture techniques.	MASA	MITADER, NGOs, academic and research institutions	1.000
7.4. Define and implement a system of high conservation value areas (HCVA) within areas of commercial agriculture, forest concessions, livestock, mining etc.	2018-2020	7.4.1. HCVA system established. 7.4.2. Number of private companies adopting the HCVA system.	MITADER, MIMAIP, MIREME	MITADER, private sector, NGOs, local communities, BIOFUND	3.000

<p>7.5. Develop and implement training modules on soil and water conservations, flood and drought mitigation measures, etc.</p>	<p>2016-2020</p>	<p>7.5.1. Number of training modules implemented.</p> <p>7.5.2. Number of stakeholders (communities, government, NGOs, etc.) trained.</p> <p>7.5.3. Number of soil and water conservation and mitigation techniques implemented.</p>	<p>MASA, research and academic institutions</p>	<p>INGC, MICTUR, local NGOs, local communities.</p>	<p>1.000</p>
<p>7.6. Review the licensing system of charcoal production and implement management plans for licensed areas.</p>	<p>2016-2020</p>	<p>7.6.1. Number of operating licenses reviewed, canceled and emitted.</p> <p>7.6.2. Number of management plans approved and implemented.</p> <p>7.6.3. Number of energetic alternatives defined and implemented.</p>	<p>MITADER, MIREME</p>	<p>MASA, NGOs, Private sector, local communities</p>	<p>2.000</p>

7.7. Establish and implement sustainable management practices for small-scale mining.	2016-2020	7.7.1. Number of mining licenses approved based on management practices. 7.7.2. Number of mining operators adopting sustainable practices (e.g. use of Mercury substitutes, soil and water management, rehabilitation of mined areas, etc.).	MIREME	MITADER, local communities, private sector	5.000
Target 8: By 2025, reduce the pollution levels at critical locations and ecosystems by 20%, pollution.					
8.1. Describe pollution levels in critical ecosystems or those providing essential goods and services.	2016-2022	8.1.1. Number of polluted ecosystems described. 8.1.2. Number of ecosystems with known levels of pollution. 8.1.3. Level of impact of pollution on critical ecosystem known.	Research and academic institutions	MITADER, private sector	3.000
8.2. Develop and implement pollution management plans for critical ecosystems or those providing essential goods and services.	2017-2025	8.2.1. Number of management plans developed and implemented. 8.2.2. Number of ecosystems with pollution level known.	MITADER	Academic and Research Institutions, private sector	3.000

8.3. Establish a coordinated program for monitoring and assess the sources, levels and impact of pollution in critical ecosystem or those providing essential goods and services	2018-2035	8.3.1. Number of monitoring programs approved and implemented. 8.3.2. Number of sites/ecosystems monitored. 8.3.3. Level of impact on critical ecosystems known.	MITADER	Research and academic institutions, private sector	2.000
8.4. Develop and implement remediation plans of polluted critical ecosystems for those providing essential goods and services.	2019-2025	8.4.1. Number of plans implemented. 8.4.2. Level of pollution reductions in critical ecosystems.	MITADER	Academic and Research Institutions, private sector	4.000
Target 9: By 2025, reduce in at least 10% the area of occurrence of invasive species and establish/implement strategies for managing the impacts.					
9.1. Establish the baseline on the occurrence, routes and impacts of invasive species.	2018-2021	9.1.1. Number of invasive species known. 9.1.2. Number of routes identified and described.	Academic and research institutions.	MASA, MITADER	3.000
9.2. Develop and implement the legal framework for monitoring, control and eradicate invasive species.	2019-2025	9.2.1. Legal framework approved and implemented. 9.2.2. Number of invasive species controlled and eradicated.	MITADER	MASA	300

9.3. Intensify research activities on invasive species (routes, abundances and impacts).	2018-2020	9.3.1. Number and type of on-going research projects. 9.3.2. Number of scientific publications.	Academic and research institutions	MITADER, MASA, Local communities	3.000
9.4. Develop and implement eradication and control plans for invasive species.	2018-2022	9.4.1. National plan for eradication and control established. 9.4.2. Area with invasive species known and monitored. 9.4.3. Catalogue on invasive species occurrence, distribution and impact developed.	MITADER, academic and research institutions.	MASA, NGOs, local communities	4.000
Target 10: By 2035, knowing the impact of climate change on vulnerable ecosystems, and put at least 20% of these ecosystems under adaptive ecosystem management.					
10.1 Intensify research about the impacts of climate changes on the vulnerable ecosystems (including agro-ecosystems).	2018-2035	10.1.1 National Research Program approved and implemented. 10.1.2. Number of research projects implemented. 10.1.3. Level of knowledge on the impact of climate changes. 10.1.4. Number of scientific publications.	Academic and research institutions, MCTESTP	MITADER, INGC, MASA, MITUR, Private sector, local communities	4.000

10.2. Implement activities defined in the National Strategy on Climate Change (NSCC)	2020-2035	10.2.1. Indicators postulated in the NSCC achieved.	MITADER, MASA	Academic and research institutions, local communities, private sector, MICTUR	-
10.3. Identify and replicate lessons and good practices on mitigation and adaptation.	2020-2035	10.3.1. Number of mitigation and adaptation projects implemented efficiently on vulnerable ecosystems.	MITADER	INGC, MICTUR, MASA, Academic and research institutions, local communities	1.000
Target 11A: By 2025, evaluate and redefine 75% of current conservation areas, and include, formally, 100% of the afromontane endemism centers (altitud >1.500m) and up to 5% of marine ecosystems and mountain in conservation areas.					
11A.1. Assess the ecological and socio-economic conditions in protected areas (PAs).	2016-2020	11.A.1.1. Number of PAs assessed.	ANAC	MASA, Academic and research institutions, BIOFUND	3.000
11.A.2. Revise the limits of PAs	2016-2020	11.A.2.1. Number of PAs with its limits revised.	ANAC	MASA, research and academic institutions, BIOFUND	1.000

11A.3. Assess the status of Forest Reserves (FRs).	2016-2020	11.A.3.1. Number of FRs assessed. 11.A.3.2. Number of FRs redefined.	MITADER	academic and research institutions, BIOFUND	3.000
11A.4. Establish biological corridors to improve connectivity and ecological integrity of the LNP, BNP and ZNP and the Marromeu Reserve	2016-2019	11.A.4.1. Number of biological corridors established.	ANAC	Research and academic institutions, BIOFUND	4.000
11A.5. Establish PAs in non-represented ecosystems (mountain, marine, biodiversity hotspots).	2016-2020	11A.5.1. Proportions of APs in mountain, marine and biodiversity hotspots.	ANAC	Research and academic institutions, BIOFUND	4.000
11A.6. Establish TFCAs between Zimbabwe, Mozambique, and Zâmbia (ZIMOZA), and between Mozambique and Tanzania.	2016-2020	11A.6.1 Percentage of TFCAs.	ANAC	Research and academic institutions, BIOFUND	5.000

11A.7. Revise the categories and management objectives according to the new <i>Conservation Law</i> .	2016-2020	11A.7.1. Number of PAs revised.	ANAC	MASA, research and academic institutions	500
11A.8. Establish and implement rehabilitation programs for degraded PAs and biodiversity valorizations.	2016-2025	11A.8.1. Number of rehabilitation programs implemented. 11A.8.2. Percentage of PAs rehabilitated and valued for its biodiversity.	MITUR	Research and academic institutions, BIOFUND	4.000
Target 11B: By 2030, manage, effectively and equitably, 50% of the protected areas.					
11B.1. Develop and update management plans for all PAs (including FRs) to follow an adaptive approach.	2016-2021	11B.1.1. Percentage of PAs with management plans established. 11B.1.2. Number of PAs with at least 50% of activities in the management plan, implemented.	ANAC	MIMAIP, MASA, NGOs, private sector, academic and research institutions, local communities, BIOFUND	4.000

<p>11B.2. Promote the participation of local communities in the decision making process on PAs management.</p>	<p>2016-2019</p>	<p>11B.2.1 Number of PAs with local management committees and community rangers.</p> <p>11B.2.2. Percentage of PAs with local communities participating in the management board.</p> <p>11B.2.3. Number of community rangers trained, equiped and participating in scouting activities.</p>	<p>ANAC</p>	<p>MASA, MIMAIP</p>	<p>1.500</p>
<p>11B.3. Establish and implemente a research program that support planning and management of PAs.</p>	<p>2015-2030</p>	<p>11B.3.1. Research program established.</p> <p>11B.3.2. Number of research projects elaborated and implemented.</p> <p>11B.3.3. Number of scientific publications on PAs.</p>	<p>ANAC, research and academic institutions</p>	<p>BIOFUN D</p>	<p>4.000</p>
<p>11B.4. Diversify the livelihood sources in the buffer areas.</p>	<p>2015-2030</p>	<p>11B.4.1. Percentage of households in the buffer areas with reduced dependency on natural resources.</p>	<p>ANAC</p>	<p>MIMAIP, MASA, MICTUR, Private Sector, NGOs.</p>	<p>1.000</p>

11B.5. Diversify and marketing the tourism products from PAs.	2016-2018	11B.5.1.Types of tourism services offered in PAs publicized. 11B.5.2. Annual income obtained and disseminated.	MITADER	MIMAIP, MICTUR	1.000
11B.6. Capacity building at higher education level in relevant scientific areas.	2015-2025	11B.6.1. Number of people capacitated and working in PAs.	Academic institutions	MICTUR, MITADER, MEF, MIMAIP, BIOFUN D	5.000
11B.7. enhance the capacity in PAs in terms of equipment, infrastructure, etc	2015-2020	11B.7.1. Number and type of equipment available. 11.B.7.2. Number and type of infrastruture built.	ANAC	MIMAIP, MOPHRH , private sector, NGOs, BIOFUN D.	10.000
11B.8. Emit licenses/ concessions to partnerships between the private sector and local communities for the constructions and exploration of tourism facilities in PAs.	2015-2018	11B.8.1. Number of PAs with tourism facilities managed through partnerships. 11B.8.2. Percentage of benefits to local communities from tourism activity.	ANA, MICTUR	Private sector, NGOs	3.000

11B.9. Intensify agriculture in buffer areas with minimum conversion of natural habitats and ecosystems.	2015-2020	11B.9.1. Type and quantity of agricultural inputs to local communities residing in buffer areas. 11B.9.2. Percentage of households in the buffer areas practicing conservation agriculture and other sustainable techniques in buffer areas.	ANAC, MASA	Local communities, NGOs private sector	3.000
11B.10. Enhance the benefit sharing from revenues from PAs (Ministerial Diploma 66/2010 on 20% of annual revenue sharing).	2015-2020	11B.10.1. Percentage of local communities benefiting effectively from conservation activities. 11B.10.2. Number and type of biodiversity conservation activities implemented by local communities.	ANAC, MICTUR, MEF	MASA, MIMAIP, BIOFUND	500
Target 12: By 2030, rehabilitate at least 15% of the degraded ecosystems /habitats, restoring its biodiversity and ensure its sustainability, with a view to mitigating the effects of climate change and combating desertification.					
12.1. Map and characterize degradations of critical habitats.	2016-2030	12.1.1. Percentage of critical ecosystems assessed and mapped.	MITADER, research and academic institutions	MASA, local communities, local NGOs, BIOFUND	4.000

12.2. Develop and implement rehabilitation programs for critical habitats.	2020-2030	12.2.1. Number of critical ecosystems rehabilitated 12.2.2. Annual rate of rehabilitations of species from specific ecosystems. 12.2.3. Number of local communities involved in rehabilitation programs.	MITADER	Academic and research institutions, MASA, MICTUR, MIMAIP, BIOFUND, private sector	5.000
12.3. Promote expeditions and collections of specimens in order to improve the database of flora and fauna species in herbaria (IIAM and DCB-UEM), Natural History Museum, etc.	2016-2030	12.3.1. Number of expeditions carried out. 12.3.2. Number of registered and cataloged species.	MITADER	MASA, MCTESTP, MINEDH, research and academic institutions	5.000
12.4. Catalogue the distribution and abundance of endangered species.	2015-2035	12.4.1. Number of cataloged species.	MITADER	MASA, MIMAIP, Research and academic institutions, NGOs, private sector	2.000

12.5. Expand turtle monitoring sites to include the nidification places outside PAs.	2015-2035	12.5.1. Number of turtle monitoring projects outside PAs.	MIMAIP	MITADER, Academic and research institutions, NGOs, private sector	2.000
12.6. Enhance the reitroduction of endangered fauna species in the PAs.	2015-2035	12.6.1. Number of individuals of endangered species reintroduced.	ANAC	BIOFUND, NGOs, private sector	5000
12.7. Enhance the monitoring of endangered marine fauna species.	2015-2035	12.7.1. Number of marine species monitored. 13.7.2. Number of new strategies approved.	MIMAIP	MITADER, BIOFUND, NGOs, private sector, research and academic institutions	5.000
12.8. Elaborate and implemente the strategies for conservation of endangered species (lion, elephant, turtle, dugongo, shark, etc.).	2015-2035	12.8.1. Number and type of conservation activities implemented. 12.8.2. Number of new strategies approved.	MITADER, MIMAIP	BIODUNF, NGOs, private sector, research and academic institutions	1.000
12.9. Update and Implement the strategy on mitigation of the human-wildlife conflict.	2015-2035	12.9.1. Number of conflicts reported. 12.9.2. Number of mititgation activities carried out.	MITADER	MASA, MAEFP, MICTUR m rivate sector	1.000

Target 13: By 2030, complete the characterization and cataloging the genetic diversity of cultivated plants and domestic animals and their threatened ancestors in natural habitats, including species of socio-economic and/or cultural value and defining strategies for their conservation.

13.1. Carry out genetic inventories of endangered species (crop, fisheries, wood and those with market potential).	2015-2030	13.1.1. genetic inventory carried out.	MASA	MCTESTP, MITADER, Research and academic institutions	6.000
--	-----------	--	------	--	-------

<p>13.2. Develop and implement management and conservations plans of genetically endangered species.</p>	<p>2020-2030</p>	<p>13.2.1 Number of management plans implemented.</p> <p>13.2.2. Number of species genetically endangered that are conserved.</p> <p>13.2.3. Number of scientific publications about genetically endangered species.</p> <p>13.2.4. Number of initiatives for genetic conservation of endangered species implemented (germplasm banks, <i>in-situ</i> gene banks semen banks, zoos and botanical gardens).</p> <p>13.2.5. Number of institutions for the conservation of genetic resources (<i>in-situ</i> e <i>ex-situ</i>) in place.</p>	<p>Academic and research institutions, MASA</p>	<p>MCTESTP , MITADER, Local communities, private sector, local and international NGOs</p>	<p>4.000</p>
<p>13.3. To develop crop varieties and animal races that are resistant to drought and diseases.</p>	<p>2015-2030</p>	<p>13.3.1. Number and type of varieties and races produced and disseminated.</p> <p>13.3.2. Number of scientific publications.</p>	<p>MASA, Academic and research institutions</p>	<p>MITADER</p>	<p>3.000</p>

13.4. Develop varieties of fish species	2015-2030	13.4.1. Number of fishery tanks constructed	MIMAIP	MITADE R, research and academic institutions	3.000
---	-----------	---	--------	--	-------

Target 14: By 2030, create and integrate the national accounts a payment mechanism for environmental goods and services to promote fair, equitable and sustainable use of biological diversity.

<p>14.1. Define a system for the payment for environmental services.</p>	<p>2016-2025</p>	<p>14.1.1. socio-economic value of main ecosystem goods and services defined (firewood and charcoal, honey, wildfruits, agrobiodiversity-pollination and others.).</p> <p>14.1.2. Value of the main ecosystem goods and services defined as well as their contribution to the national accounting system.</p> <p>14.1.3. Economic tools to quantify and mainstream biodiversity in the national accounting system created.</p> <p>14.1.4. % of the contribution of biodiversity, goods and services from natural ecosystems to the GDP.</p> <p>14.1.5. % of contribution of the biodiversity to the livelihoods of human population (heahs, self-employment etc.).</p>	<p>MEF, MITADER</p>	<p>MASA, MICTUR, MIREME, MIMAIP</p>	<p>4.000</p>
--	------------------	--	---------------------	-------------------------------------	--------------

14.2. Enhance the institutional capacity in the use of accounting tools and mainstreaming the biodiversity value.	2016-2020	<p>14.2.1. Number of capacitated people at higher educations level.</p> <p>14.2.2. Number of traning sessions.</p> <p>14.2.3. Number of people trained in the use of tools for quantification of biodiversity.</p> <p>14.2.4. Percentage of the contribution of the biodiversity , goods and services to the national GDP</p>	Academic institutions, research and academic institutions	MICOA, MITUR, MITADER, MICTUR, MASA, MEF, BIOFUND	4.000
Target 15: By 2025, Knowing and strengthen the contribution of biodiversity to increase the stock of carbon in order to mitigate and adapt to climate change.					
15.1. Finalize the processo of approval of the <i>National Strategy on REDD+</i> .	2015-2016	15.1.1 <i>National Strategy on REDD+</i> approved.	MITADER		500
15.2. Develop and implement national carbon accounting methodologies.	2015-2020	<p>15.2.1. National methodologies defined.</p> <p>15.2.2. Number of carbon inventories carried out.</p>	Academic and research institutions	MASA, MITADER, MICTUR, BIOFUND	3.000
15.3. Assess the carbon <i>stock</i> in the critical ecosystems or those considered relevamt.	2015-2025	<p>15.3.1. Number of ecosystems assessed.</p> <p>15.3.2. Quantity of carbon per ecosystem type.</p>	Academic and research institutions	MASA, MITADER , BIOFUND	2.000

15.4. Promote and implement REDD+ programs in critical ecosystems or those considered necessary..	2017-2025	<p>15.4.1. Percentage of forested area certified for carbon sequestration.</p> <p>15.4.2. Number of REDD+ projects implemented.</p> <p>15.4.3. Number of local communities involved and benefiting from REDD+ projects.</p>	MITADER	Private sector, NGOs, Local communities, MEF	3.000
15.5. Promote the implementation of energy systems that reduce emissions (use of methane for energy generation, improved stoves, etc.)	2017-2025	<p>15.5.1. Number of energy systems in place.</p> <p>15.5.2. Percentage of community members that utilize improved systems.</p>	MIREME, MASA	MITADER	3.000
15.6. Promote the involvement of the private sector in voluntary initiatives for biodiversity conservation.	2017-2025	<p>15.6.1. Mechanisms of voluntary payment established.</p> <p>15.6.2. Number of companies involved.</p>	MITADER, MEF	MASA, MICTUR, MIMAIP, MIREME	1.000

15.7. Prepare the national legislation to the introduction of an environmental rate to compensate for the use of biodiversity and ecosystem services, for specific sectors.	2018-2022	15.7.1. National legislation approved. 15.7.2. Percentage of rates charged.	M I C O A , FUNAB	MEF, MIREME, MASA, MICTUR, MEF, MIREME, MASA, MICTUR, MOPH, municipalities.	1.000
Target 16: By 2020, implement national legislation on access and benefit sharing arising from the use of biodiversity and genetic resources.					
16.1. Establish a mechanism to register the material transfer, according to the <i>National Regulation on ABS</i> .	2018-2020	16.1.1. List of transferred material/ database established. 16.1.2. Number of ABS agreements / Value of benefit shared.	MITADER	MASA, MISAU, MCTESTP, MIMAIP, research and academic institutions.	2.000
16.2. Establish a Program for the dissemination of <i>ABS</i> related legislation.	2015-2016	16.2.1. Dissemination program elaborated and approved.	MITADER		500
16.3. Create a database on the traditional knowledge and make it publicly available in the internet.	2017-2020	16.3.1. Database approved and available. 16.3.2. Number of accesses to the database.	MITADER, MISAU	MASA, NGOs, academic and research institutions	1.000

16.4. Establish a program for capacity building on <i>ABS</i> .	2015-2020	16.4.1. Training modules developed. 16.4.2. Number of technical assistance to enhance the national programs of <i>ABS</i> . 16.4.3. Number of people capacitated in <i>ABS</i> .	Academic institutions	MICOA	3.000
16.5. Develop the Legal Framework on the <i>ABS</i> .	2017-2020	16.5.1. Legal framework developed, enhances and expanded.	MITADER	MIMAIP, MISAU, MASA	500
Target 17: By 2020, the sectors involved in biodiversity issues must develop, based on national targets, sectoral goals, integrate them into sectoral plans, and start implement it.					
17.1. Elaborate sectoral targets for biodiversity conservation.	2016-2020	17.1.1. Guidelines to mainstream biodiversity in all key sectors. 17.1.2. Number of institutions with biodiversity targets defined.	MITADER	MIMAIP, MIREME, MEF, MICTUR, MASA	300
17.2. Develop and implement sectoral actions plans for the conservation of biodiversity.	2016-2020	1. Number of Institutions at provincial and district level with established action plans on biodiversity.	MITADER, MEF	MIMAIP, MIREME, MCTESTP, MOPH	200

17.3. Plan and budget biodiversity actions in key sectors.	2016-2020	17.3.1. Number of sectors with plans and budget that include biodiversity actions. 17.3.2. Number of initiatives related to biodiversity in each sector.	MEF, MITADER	MIMAIP, MIREME, MCTEST P	200
Target 18: By 2035, value and respect the knowledge and traditional uses of on biodiversity, in accordance with national legislation.					
18.1. Establish, enhance and operationalize the community biodiversity management committees at all levels.	2016-2020	18.1.1. Number of community biodiversity management committees established. 18.1.2. Number of training sessions carried out. 18.1.3. Terms of Reference of the members and selected. 18.1.4. Number of members and technicians selected and integrated in the organic structure.	MITADER	MIMAIP, MASA, MICTUR	1.000
18.2. Assess and catalogue the traditional knowledge from local communities.	2015-2020	18.2.1. Number of publications on traditional knowledge. 18.2.2. Number of initiatives that promote the traditional knowledge.	MITADER, Research and academic institutions	MITADER, MASA, MICTUR, MCTEST P	1.000

18.3 Carry out dissemination seminars on the impact and importance of the traditional knowledge on the management and conservation of biodiversity.	2015-2020	18.3.1. Number of seminars carried out. 18.3.3. Number of traditional practices mainstreamed in management and conservation activities.	MITADER, Research and academic institutions	MICTUR, MASA, MISAU, MCTEST P	1.000
18.4. Disseminate information about the traditional knowledge through the production of audiovisual material (radio, TV, leaflets, brochures, T-shirts, <i>capulanas</i> , etc.).	2016-2035	18.4.1. Number and type of material produced. 18.4.2. Number of dissemination initiatives carried out.	MITADER, MICTUR	M A S A , MIC, MISAU, MCTEST P	1.000
Target 19: By 2035, strengthen the capacity of key stakeholders and improve the integration of gender issues, to enable the effective implementation of national targets.					
19.1. Elaborate modules about biodiversity and implement training programs for key stakeholders.	2015-2020	19.1. 1. Number of training modules produced. 19.1.2. Number of training sessions carried out. 19.1.3. Number of technicians trained.	MITADER, MIGECAS	Research and academic institutions, NGOs, private sector	500

19.2. Disseminate the <i>NBSAP</i> .	2015-2025	19.2.1. Number of initiatives and dissemination material 19.2.2. Number of dissemination materials carried out.	MITADER	MASA, MISAU, MCTESTP, MIREME	1.000
19.3. Assess the relationship between biodiversity and gender.	2015-2030	19.3.1. Number of reports and scientific publications on the relationship between gender and biodiversity. 19.3.2. Strategy on gender, environment and climate change revised to account for biodiversity issues.	Research and academic institutions, MIGECAS, MITADER	M A S A , MISAU-MCTESTP	2.000
19.4. Enhance gender units at local level	2018-2025	19.4.1. Number of seminars on gender and biodiversity carried out. 19.4.2. Number of focal points appointed at local level.	MITADER, MIGECAS	MASA, MEF, MIREME, local communities, NGOs	3.000

Target 20: By 2020, strengthen national and international partnerships and establish innovative mechanisms for financing and support biodiversity programs.

20.1. Carry out actions to mobilize and enhance national, regional and international partnerships.	2015-2020	20.1.1. Number of partners involved in the funding mobilization for conservation of biodiversity. 20.1.2. Level of technical and financial support from partners.	MITADER	MICTUR, MASA, MIMAIP, MEF.	400
20.2. Organize bia-annual conferences about partnerships for NBSAP implementation.	2016-2020	20.2.1. Number of conferences carried out. 20.2.2. Number of partner and collaborating institutions.	MITADER	MINAG, MITADER, MISAU, MCTESTP, Private sector privado, NGOs, civil society.	500
20.3. Elaborate a business plan to financing the NBSAP.	2015-2020	20.3.1. Business plan elaborated.	MITADER		1.000

Chapter VII: MECHANISM FOR IMPLEMENTATION, MONITORING, ASSESSMENT AND REPORTING

This strategy follows an implementation, monitoring and evaluation plan to ensure the success of its implementation, through greater participation and involvement of local communities, NGOs, civil society and the private sector in implementing the strategy. The following describes the implementation, monitoring and evaluation mechanisms established under this strategy and its action plan.

7.1 Implementation mechanisms

For effective implementation of this strategy, the existing mechanisms and institutional structures in Mozambique should be used.

MITADER as the institution responsible for the coordination of environmental action, and as the focal point of the *CBD*, should coordinate all activities related to this document. In 2000 former MICOA created the *National Biodiversity Unit (NBU)*, which is represented by the different sectors and therefore should be able to advise the MITADER in implementing this NBSAP. The UT-REDD⁺ must advise in respective issues. In performing its functions the MITADER should work with the environmental focal points in all institutions carrying out activities under this strategy. At the provincial level, the DPCA must coordinate with relevant institutions and ensure its implementation at the local level. The various actors at national, provincial and local include (Figure 5):

- Government institutions;
- International organizations;
- Private sector;
- National and international NGOs;
- Local communities; and
- Teaching and research institutions.

In order to ensure participation and involvement of all stakeholders, the following are proposed tools:

- Strengthening the Education Program on Environmental Communication and Dissemination (PECODA);
- Capacity building program on biodiversity;
- Evaluation of technical and technological needs of biodiversity;
- Strategy for resource mobilization for biodiversity; and

- Carry our bi-annual conferences to assess the implementation level of this NBSAP.

These should be coordinated nationally by MICOA, but all activities related to biodiversity should be integrated into sectoral and institutional activities.

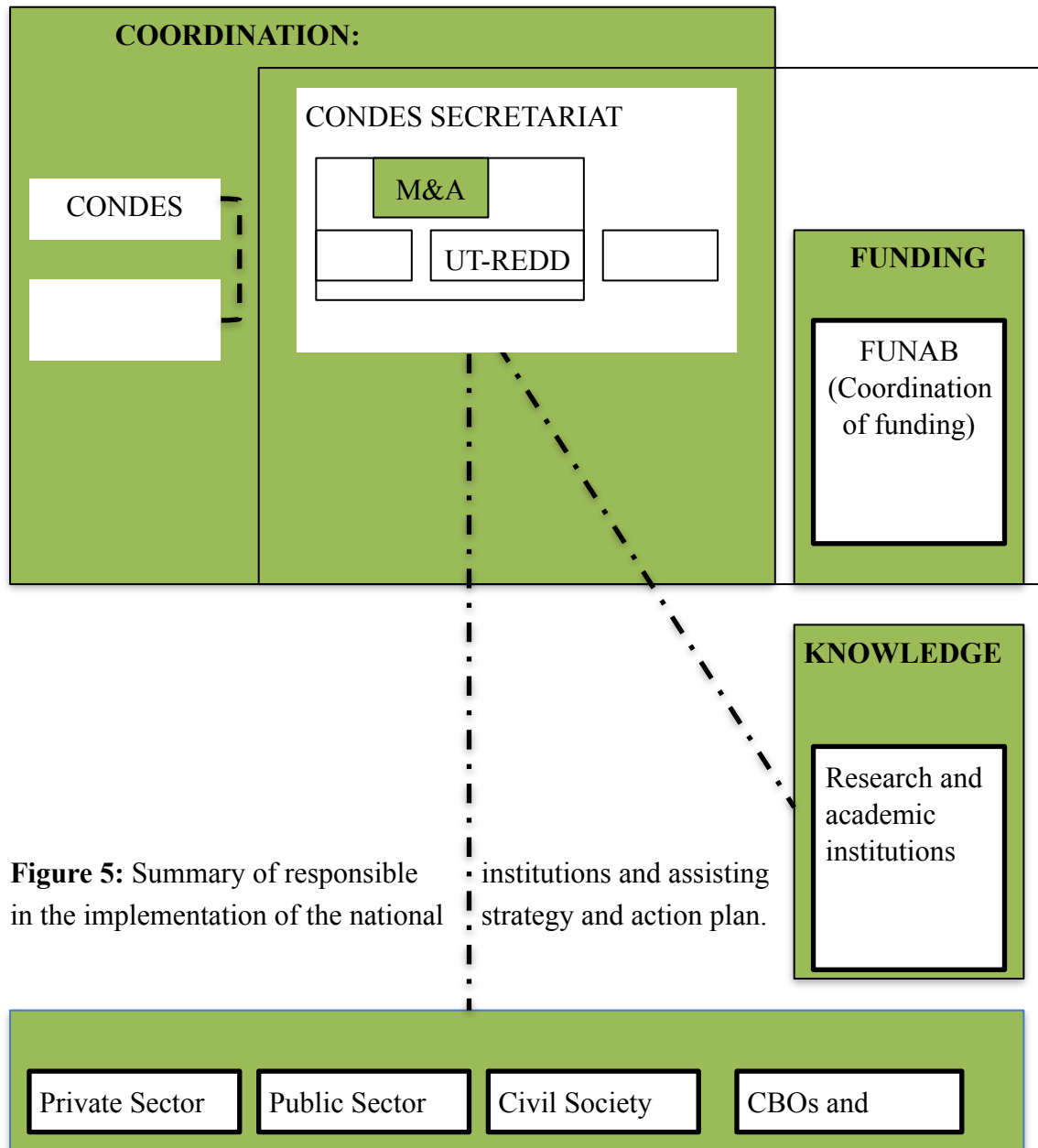


Figure 5: Summary of responsible institutions and assisting in the implementation of the national strategy and action plan.

7.2. Monitoring and evaluation

Monitoring and evaluation mechanisms should be developed at national, provincial, district and local, in the initial phase of implementation of this strategy. To this end, institutions must integrate these mechanisms in their plans and programs, through the annual planning process to include activities related to biodiversity in the Annual Operating Plan (AOP) and the Economic and District Budget Plan (PESOD).

The MEF will have the crucial function to integrate and harmonize all sectoral and district planned activities, ensuring the budget and the effectiveness in carrying out the activities.

Nationally, the NBU, should be actively involved in the coordination and follow-up monitoring and evaluation activities related to the implementation of this strategy and action plan. However, the provincial and district level should be very structures of monitoring and evaluation created. In this sense, it is important that awareness and capacity building efforts are strengthened. It is also important that local communities are trained and have the necessary tools in order to participate actively in the monitoring and evaluation process.

The availability of the budget is important for monitoring and evaluation, as well as technical guidelines should be formulated for assessing the performance of the strategy and action plan at different levels.

Some essential elements for an effective system of monitoring and evaluation are:

- The baseline on the changes in ecosystems;
- The time frame established for this strategy, as the year 2017;
- The establishment of institutional agreements and capacity building for monitoring and assessment of this NBSAP;
- Present clear results to decision-makers, interest groups, etc;
- Provide reliable and timely information on populations of animals and plants, trends and dynamics;
- Monitor the impact of the implementation of the activities, policies and laws related to biodiversity;
- Assess trends in social, political and economic factors; and
- Assess trends in monetary and non-monetary values of biodiversity and the costs and existing investments.

7.3 Report

The regular report on progress in implementing this strategy and its action plan is important and will ensure the timely generation of information for their integration at national, sectoral and international level processes.

The progress report should be aligned with the annual process of reporting on the activities carried out at the end of the fiscal year. The annual reports will form the

basis for planning the activities of the following year (July-August), and will be harmonized with the preparation of the state budget, that is, at the end of each financial year shall be presented the progress report, and the planning activities for the following financial year. This progress report will be integrated in the National Report on Biological Diversity to be submitted to the CBD every 4 years. The report to be submitted in 2025 will also evaluation of mid-term strategy and action plan. The purpose of this should be identifying areas that require strengthening for effective implementation by the end of the period. The 2035/36 report should serve as a basis for end-period document of this strategy and action plan. The aim of this should be to determine areas that require strengthening and identifying gaps for the review of this strategy and action plan.

Chapter VIII: BIBLIOGRAPHY

- Alves, T e Sousa, C.** 2009. *Avaliação dos Ecossistemas Montanhosos em Moçambique*. IIAM.
- Benayahu, Y.; Shlagman, A.; Schleyer, M.H.** 2003. *Corals of the South-west Indian Ocean: VI. The Alcyonacea (Octocorallia) of Mozambique, with a discussion on soft coral distribution on South Equatorial East African reefs*. Zool. Verh. Leiden 345, 31.x.2003: 49-57, fig. 1.— ISSN 0024-1652/ISBN 90-73239-89-3.
- Burgess, N. et al.** 2004. *Terrestrial Eco regions of Africa and Madagascar: A Continental Assessment*. Island Press, Washington, DC, USA.
- Burgess, N.D.; Clarke, G. P. (Eds.)**. 2000. *Coastal Forests of Eastern Africa*. IUCN Forest Conservation Programme, Gland, Switzerland and Cambridge, England. 443pp.
- Costa, D.; Soto, B.** 2012. *Meio Ambiente em Moçambique: Notas para reflexão sobre a situação actual e os desafios para o futuro*.
- Duarte, M.C.; Romeiras, M.M.; Bandeira, S.** 2012. *Atlas do Congresso Internacional Saber Tropical em Moçambique: História, Memória e Ciência*. IICT – JBT/Jardim Botânico Tropical. Lisboa, 24-26 Outubro de 2012.
- FAO.** 2010. *Global Forest Resources Assessment 2010: Country Report Mozambique*. FRA2010/140. Rome.
- Fischer, W.; Sousa, I.; Silva, C.; de Freitas, A.; Poutiers, J.M.; Schneider, W. ; Borges, T.C.; Féral; Massinga, J.P.A.** 1990. *Guia de Campo das Espécies Comerciais Marinhas e de Águas Salobras de Moçambique*. Roma, FAO. 424 pp.
- Froese, R.; Pauly D. (eds.)**. 1999. *Fish Base 99*. Disponível em: www.fishbase.org.
- Hart, R.C.; Boane, C.** 2004. *Limnology of Southern African coastal lakes — new vistas from Mozambique*. African Journal of Aquatic Science: vol. 29, n. 2. South Africa.
- Hatton, J. (ed)**. 1995. *A Status quo assessment of the coastal zone, Mozambique*. Phase 1: Ponta do Ouro – Xai-Xai. IUCN: 1-60pp.
- Hoguané, A.M.; Pereira, M.A.M.** 2003. *National Report: Marine biodiversity in Mozambique – the known and the unknown*. p. 138-155. In: C. Decker, C. Griffiths, K. Prochazka, C. Ras & A. Whitefield, *Marine Biodiversity in Sub-Saharan Africa: the known and the unknown*. Proceedings of the marine biodiversity in Sub-Saharan Africa: the known and the unknown Cape Town, South Africa 23-26 September 2003.
- INE.** 2007. *Contas Nacionais Preliminares I, Trimestre 2007*. Instituto Nacional de Estatística, Direcção das Contas Nacionais e Indicadores Globais, Maputo, Moçambique.
- Izidine, S.; Bandeira, S.O.** 2002. *Mozambique Plant Red Data List*. In JS. Golding (ed.) Southern African Plant Red Data Lists. Southern African Botanic Diversity Network Report Serie 14. National Botanic Institute, Pretoria. pp 43-60.
- Mafuca, J.M.** 2002. *Avaliação Preliminar de Kapenta (Limnothrissamiodon, Boulanger 1906), em Cahora Bassa com base em dados históricos de captura e esforço de 1995-2000*. Revista de Investigação Pesqueira 23. Moçambique.

- Marzoli, A.** 2007. Relatório do Inventário Florestal Nacional. Direcção Nacional de Terras e Florestas. Ministério da Agricultura. Maputo, Moçambique.
- MICOA.** 2003. *Estratégia e Áreas de Acção para a Conservação da Diversidade Biológica em Moçambique*. Ministério para a Coordenação da Acção Ambiental (MICOA), Maputo
- MICOA.** 2007. *Plano Nacional de Adaptação às Mudanças Climáticas*. Ministério para a Coordenação da Acção Ambiental. Maputo.
- MINAG.**2010. *Plano Estratégico para o Desenvolvimento do Sector Agrário (PEDSA): 2020-2019*. Maputo. 64pp.
- Nube, T.G.** 2013. *Impactos socioeconómicos das plantações florestais em Moçambique: um estudo de caso na Província de Niassa*. Tese de Mestrado. Universidade Federal do Paraná, Curitiba. 81p.
- Pereira, M. A. M.** 2000. *Estudo Comparativo das Comunidades Ictiológicas de dois Recifes de Coral da Ilha da Inhaca e sua Relação com a Estrutura do Habitat*. Tese de Licenciatura. 68 pp. Maputo, Universidade Eduardo Mondlane.
- Rodrigues, M. J.; Motta, H.; Whittington, M.; Schleyer, M.** 2000. *Coral Reefs of Mozambique*. In: Maclanahan, T., D. Obura& C. Sheppard (eds.). *Coral Reefs of the Western Indian Ocean – Their Ecology and Conservation*.111–132 pp. Oxford University Press, New York.
- Sitoe, A.; Salomão, A.; Werte-Kanounnikoff.** 2012. *O contexto de REDD+ em Moçambique: Causas, actores e instituições*. Universidade Eduardo Mondlane, Centro Terra Viva, Center for International Forestry Research (CIFOR) (Publicação ocasional 76).
- Spalding, M., Ravilious, C.& Green, E.P.** 2001. *World Atlas of Coral Reefs*. Berkeley, CA: University of California Press.
- Umarji, M.B.; Makda, S.Y.; Machel, R.E.; Lalá, A.E.** 2010.*Impacto da Iniciativa de transparência das Industrias extractivas (ITIE) nas receitas do estado em Mocambique*. CIP. 44p.
- vanWyk, A. E.** 1994. *Maputaland-Pondoland Region.South Africa, Swaziland and Mozambique. Em: Centers of Plant Diversity. A guide and strategy for their conservation*. Vol. 1. WWF & IUCN, Pretoria.
- White F.** 1983. The Vegetation of Africa. *Natural Resources Research* **20**, UNESCO, Paris.