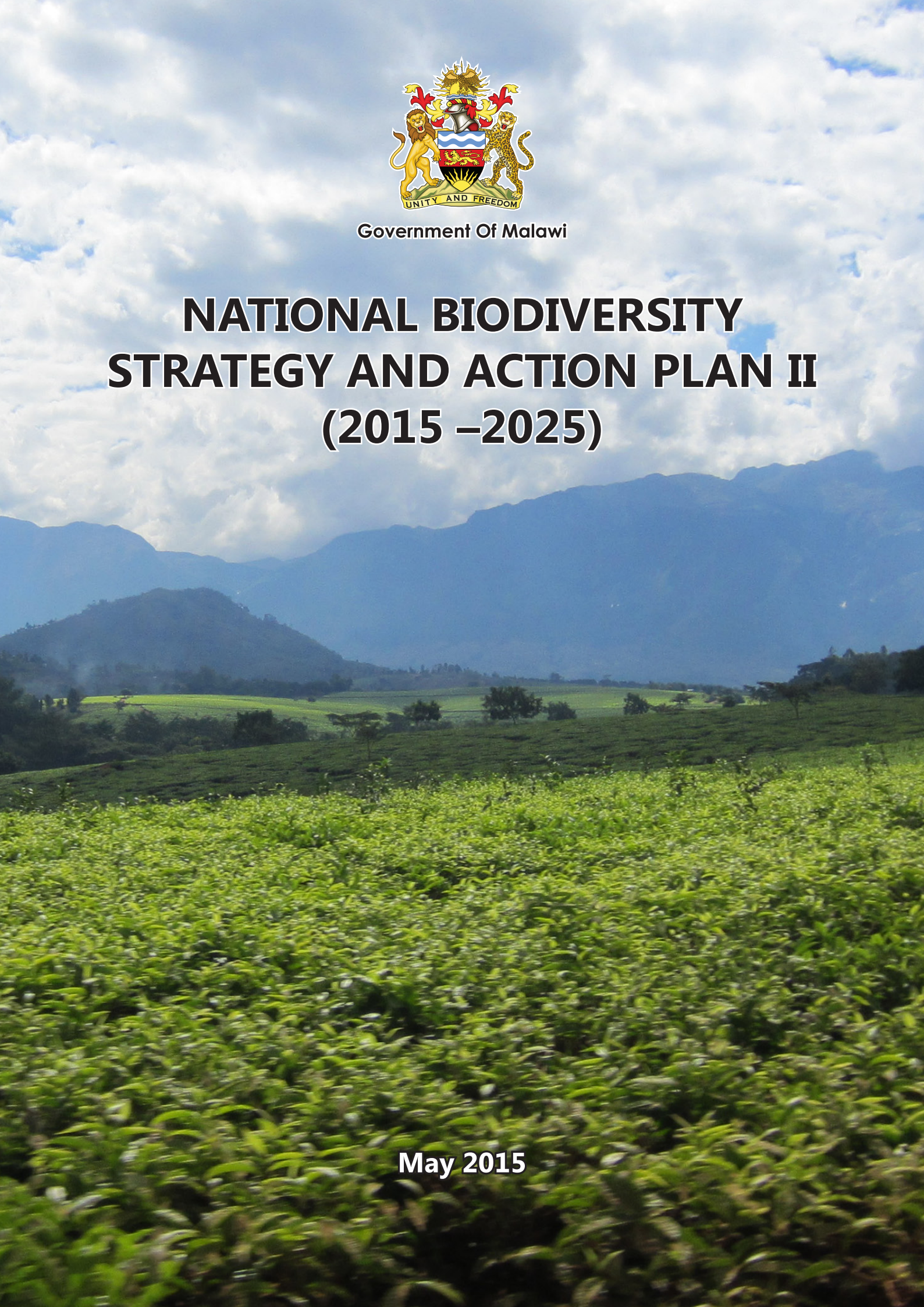

Government Of Malawi

NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN II (2015 –2025)

May 2015

PREFACE

Biodiversity provides goods and services in the form of ecosystems, species and genetic resources for human well-being and economic development. Malawi is endowed with unique flora, fauna and ecosystems, which provide various benefits such as food, shelter, medicine, ecological as well as cultural and spiritual services. The sustainability of biodiversity in Malawi is threatened by habitat loss and fragmentation, overexploitation of biological resources, pollution, climate change and infestation of invasive alien species. Despite all these threats, Malawi is committed to improve the status and promote sustainable utilization of biodiversity in the country.

This National Biodiversity Strategy and Action Plan II is a framework for action that will guide Malawi to sustainably manage its biodiversity. The Strategy outlines the status of the biological resources in Malawi and provides strategies, targets and actions to be taken to ensure their sustainable management.. This Strategy strives to attain improved capacity and knowledge on biodiversity management; increased mainstreaming of biodiversity in sectoral and local development policies and plans; reduced direct pressures on biodiversity; improved status of biodiversity through safeguarding of ecosystems, species and genetic diversity; and enhanced benefits to all from biodiversity and ecosystem services. The strategy is in line with the Malawi Growth and Development Strategy II, which prioritises biodiversity management programs among other socio-economic and environmental issues.

This NBSAP was developed through a consultative process involving key stakeholders at international, regional, national and local levels. I am confident that the same commitment that prevailed during the revision process of this strategy will continue during its implementation.

The Ministry of Natural Resources, Energy and Mining is grateful to the Global Environmental Facility (GEF) through the United Nations Environment Program (UNEP) for the financial and technical support rendered towards the development of this Strategy.

It is my sincere hope that this NBSAP will increase our appreciation of the rich biological resources and that it will provide a strategic framework for improving environmental management in the country.

Hon Bright Msaka, SC
Minister of Natural Resources, Energy and Mining

ACKNOWLEDGEMENTS

The Ministry of Natural Resources, Energy and Mining wishes to express its appreciation to all the stakeholders i.e. Government Ministries and Departments, academic, civil society, local authorities and private sector that provided valuable information for the production of this document.

The Ministry recognises the following individuals for their tireless efforts in drafting and editing this document: Dr. Aloysius Mphatso Kamperewera (deceased), Mpeta K. M. Mwanyongo, Tawonga Mbale, Shamiso Najira, Clement M. Tikiwa, Monipher Musasa-Jenda, Peter Mmora, John Mawenda, Mphatso Martha Kalemba from the Environmental Affairs Department; Dr. M. Mwanyambo and Jameson Kamwendo from the National Herbarium and Botanical Gardens of Malawi; Moffat Manase from the Department of Fisheries; Nolipher Mponya from the National Plant Genetic Resources Centre; Jester Kaunga-Nyirenda from the Department of National Parks and Wildlife; Titus Zulu from the Department of Forestry; Gerald Meke from the Forestry Research Institute of Malawi; William Simwanza from the Ministry of Finance and Economic Development; Yohane Chimbalanga from National Commission for Science and Technology and Luka Nyirongo and Lovemore Nyongo from the Ministry of Natural Resources, Energy and Mining.

Special thanks should also go to Jodie Vanyo, former Fulbright-Clinton Fellow with the Ministry of Natural Resources, Energy and Mining, who served as the graphic designer and final copy editor for this document.

The Ministry further acknowledges the technical and financial support from the Secretariat to the Convention on Biological Diversity, United Nations Environment Programme and the NBSAP Forum during the preparation of this strategy.

Ben Botolo
Secretary for Natural Resources, Energy and Mining

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ACRONYMS AND ABBREVIATIONS

ABS-CH	Access and Benefit Sharing Clearing House
CBD	Convention on Biological Diversity
CBNRM	Community-Based Natural Resources Management
CBOs	Community-Based Organisations
CCENR	Cabinet Committee on Environment and Natural Resources
CEPA	Communication, Education and Public Awareness
CHM	Clearing House Mechanism
COP	Conference of the Parties
CSOs	Civil Society Organisations
DARS	Department of Agricultural Research Services
DEAP	District Environmental Action Plan
DESC	District Environment Subcommittee
DF	Department of Fisheries
DNPW	Department of National Parks and Wildlife
DoF	Department of Forestry
EAD	Environmental Affairs Department
EMA	Environment Management Act
FRIM	Forestry Research Institute of Malawi
GDP	Gross Domestic Product
GEF	Global Environment Facility
GMOs	Genetically Modified Organisms
GoM	Government of Malawi
GR	Genetic Resources
HIV/AIDS	Human Immunovirus / Acquired Immunodeficiency Syndrome
IAS	Invasive Alien Species
IBAs	Important Bird Areas
IKS	Indigenous Knowledge Systems
IPR	Intellectual Property Rights
LBSAP	Local Biodiversity Strategy and Action Plan
LUANAR	Lilongwe University of Agriculture and Natural Resources
MEET	Malawi Environmental Endowment Trust
MGDS II	Malawi Growth and Development Strategy II
MK	Malawi Kwacha
MMCT	Mulanje Mountain Conservation Trust
MoAIWD	Ministry of Agriculture, Irrigation and Water Development
MoECCM	Ministry of Energy and Climate Change Management
MoEP&D	Ministry of Economic Planning and Development
MoF	Ministry of Finance

MoLGRD	Ministry of Local Government and Rural Development
MRA	Malawi Revenue Authority
MZUNI	Mzuzu University
NBSAP	National Biodiversity Strategy and Action Plan
NCE	National Council on Environment
NCST	National Commission for Science and Technology
NEAP	National Environmental Action Plan
NECCCS	National Environment and Climate Change Communication Strategy
NEP	National Environmental Policy
NGOs	Non-Governmental Organisations
NHBGM	National Herbarium and Botanic Gardens of Malawi
NPGRC	National Plant Genetic Resource Centre
NRC	Natural Resources College
NSO	National Statistical Office
PCANR	Parliamentary Committee on Agriculture and Natural Resources
POWPA	Program of Work on Protected Areas
PPP	Public-Private Partnerships
THA	Traditional Healers Association
TK	Traditional Knowledge
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
UNIMA	University of Malawi
VNRMCs	Village Natural Resources Management Committees
WESM	Wildlife and Environment Society of Malawi

EXECUTIVE SUMMARY

This National Biodiversity Strategy and Action Plan II (NBSAP II) provides Malawi's strategies and action plans for the management of biodiversity from the period 2015-2025. It has been prepared in response to the Malawi Growth and Development Strategy II (MGDS II 2011-2016), which prioritises biodiversity management programs among other socio-economic and environmental issues. In addition, this strategy demonstrates Malawi's commitment to the implementation of Decision X/2 of the Tenth Conference of Parties (CoP10) of the Convention on Biological Diversity (CBD), which requested parties to revise their strategies in line with the Global Strategic Plan for Biodiversity.

This strategy describes Malawi's unique biodiversity, which comprise a variety of ecosystems and species. The greatest diversity of species in Malawi is in protected areas, comprising 87 forest reserves, five national parks and four wildlife reserves that cover a total of 1.8 million hectares. Aquatic ecosystems, on the other hand, cover 20% of the total land area of Malawi. They are a habitat to several species of amphibians, reptiles and water plants. The highest diversity and endemism of aquatic life is found in Lake Malawi, with over 1,000 species of fish.

Furthermore, some of Malawi's biodiversity is conserved in gene banks and botanical gardens like the National Plant Genetic Resource Centre, Agricultural Research Stations, National Herbarium and Botanical Gardens, Academic Institutions and the Forestry Research Institute of Malawi. As of the year 2014, the Malawi Genetic Resource Centre gene banks had over 4,613 accessions from 32 species and of these 4,097 are seed samples and 516 are vegetative materials collected from all the districts of Malawi.

Biodiversity in Malawi contributes significantly to the economy and well-being of the people of Malawi. For example, in the year 2010, forestry, fisheries and wildlife sectors contributed 12.8% to its Growth Domestic Product (GDP). However, Malawi's biodiversity is threatened by habitat loss and fragmentation, invasive alien species, overexploitation, pollution and climate change.

This revised NBSAP addresses these threats and challenges affecting implementation of biodiversity programmes,which include:

- Inadequate human and institutional capacities for biodiversity conservation;
- Inadequate co-ordination between and within institutions dealing with biodiversity;
- Lack of framework legislation on biodiversity;
- Weak enforcement of existing legal mechanisms;
- Inadequate integration of biodiversity conservation into sectoral plans ;
- Inadequate public awareness on the importance of biodiversity;

- Inadequate community participation in biodiversity management; and
- Inadequate funding for biodiversity management.

The goal of this strategy is to enhance the management of biodiversity for economic growth and well-being of the present and future generations. This will be achieved through the attainment of the following specific strategic goals:

a) Improved capacity and knowledge on biodiversity issues;
b) Increased mainstreaming of biodiversity management into sectoral and local development planning;
c) Reduced direct pressures on biodiversity;
d) Improved status of biodiversity by safeguarding ecosystems, species and genetic diversity; and
e) Enhanced access and benefit sharing from biodiversity and ecosystem services.

With a view to attaining these strategic objectives, 16 targets and a set of actions have been developed.

To effectively implement this strategy, monitoring and evaluation plans have been developed. Capacity building and public awareness plans have also been developed and have been annexed in this document to ensure that there is adequate participation in implementing the strategy. Further, a resource mobilization plan has been developed highlighting possible sources of funding, which include the government of Malawi, local and international donors and the private sector to finance implementation of this strategy. A total of US $117,000,000 has been estimated as the amount of money required to successfully implement NBSAP II.

In conclusion, it is envisaged that this NBSAP will provide an avenue for achieving long-term goals on conservation and sustainable use of biodiversity as prescribed in the Constitution of Malawi, National Environment Policy (NEP) of 2004, Environment Management Act (EMA) of 1996 and other national and sectoral policies, plans and strategies.

Chapter One

Overview of Biodiversity Status, Trends and Threats

Photo Credit: Wildlife Environmental Society of Malawi

1.1 BACKGROUND

Malawi is located in the southern part of Africa with a total area of 119,140 km^2, of which 20% is water. The country is bordered with Tanzania to the north, Mozambique to the east, south and southwest, and Zambia to the west, as shown in figure 1. It is located between latitudes 90° 221° and 170° 031° S and longitude 330° 401° and 350° 551° E. The country has a tropical climate with variable temperatures, relative humidity and fertile soils. The country's Gross Domestic Product (GDP) was estimated at US $3.5 billion in 2011, equivalent to per capita income of about US $360 (Bertelsmann, 2012). Currently, the population of Malawi is estimated at 15.4 million with an average density of 139 people /km^2 and population growth rate of 2.8% per annum (GoM, 2012). This population is highly dependent on biological resources for its livelihood.

The country is endowed with a diversified natural resource base, which comprises of abundant water resources and unique and diverse flora and fauna. It has a tropical climate characterized by variable temperatures, rainfall, relative humidity and fertile soils.

Malawi recognizes the importance and the need to conserve biodiversity. In 2006, the Malawi Government developed the first National Biodiversity Strategy and Action Plan (NBSAP) as a tool for biodiversity management. The NBSAP provides an avenue for achieving long-term goals on conservation and sustainable use of biodiversity in accordance with the Constitution, National Environmental Policy (NEP, 2004) and Environment Management Act (EMA, 1996) and other national and sectoral policies, plans and strategies. The NBSAP has been revised in response to the Malawi Growth and Development Strategy II (MGDS II) 2011-2016, which prioritises biodiversity management programs among other key socio-economic and environmental issues. In addition, NBSAP II demonstrates Malawi's commitment to implement its obligation to the Convention on Biological Diversity (CBD) and the Global Strategic Plan on Biodiversity.

1.2 VALUE OF MALAWI'S BIODIVERSITY

Biodiversity in Malawi is important for economic, socio-cultural and ecological purposes. Biodiversity contributes significantly to the economy and poverty alleviation in Malawi. For example, agro biodiversity was estimated to contribute about 40% of the Gross Domestic Product (GDP) and more than 90% of employment and merchandise export earnings in 2010. Fisheries, forestry and wildlife sectors contributed 12.8% towards the GDP in the year 2010 (Yaron et al, 2011). Furthermore, through Community Based Natural Resources Management, especially in National Parks and Forest Reserves, communities have been able to integrate biodiversity conservation and rural development to contribute to rural poverty alleviation. Communities practice sustainable harvesting techniques of fish and wildlife, promote eco-tourism, and carry out income-generating activities like mushroom production and bee keeping, thereby taking away pressures on natural resources.

Biodiversity satisfies a number of socio-cultural functions in Malawi. Spiritually, most Malawian ethnic groups believe in the existence of a supernatural being or ancestral spirits that are associated with graveyards or mountain areas covered by forest biodiversity. For example, the Mang'anja of Nsanje worship their ancestral spirit M'bona in Khuluvi Forest. Gule wa Mkulu from the Chewa tribe and the Ingoma dance from the Ngoni tribe also have their regalia based on plants and animal products. These practices contribute to knowledge and conservation of biodiversity in sacred sites.

Furthermore, biodiversity provides other social benefits such as recreation and tourism. Major tourist attractions in the country include water bodies, national parks, wildlife reserves, mountains and cultural heritage that

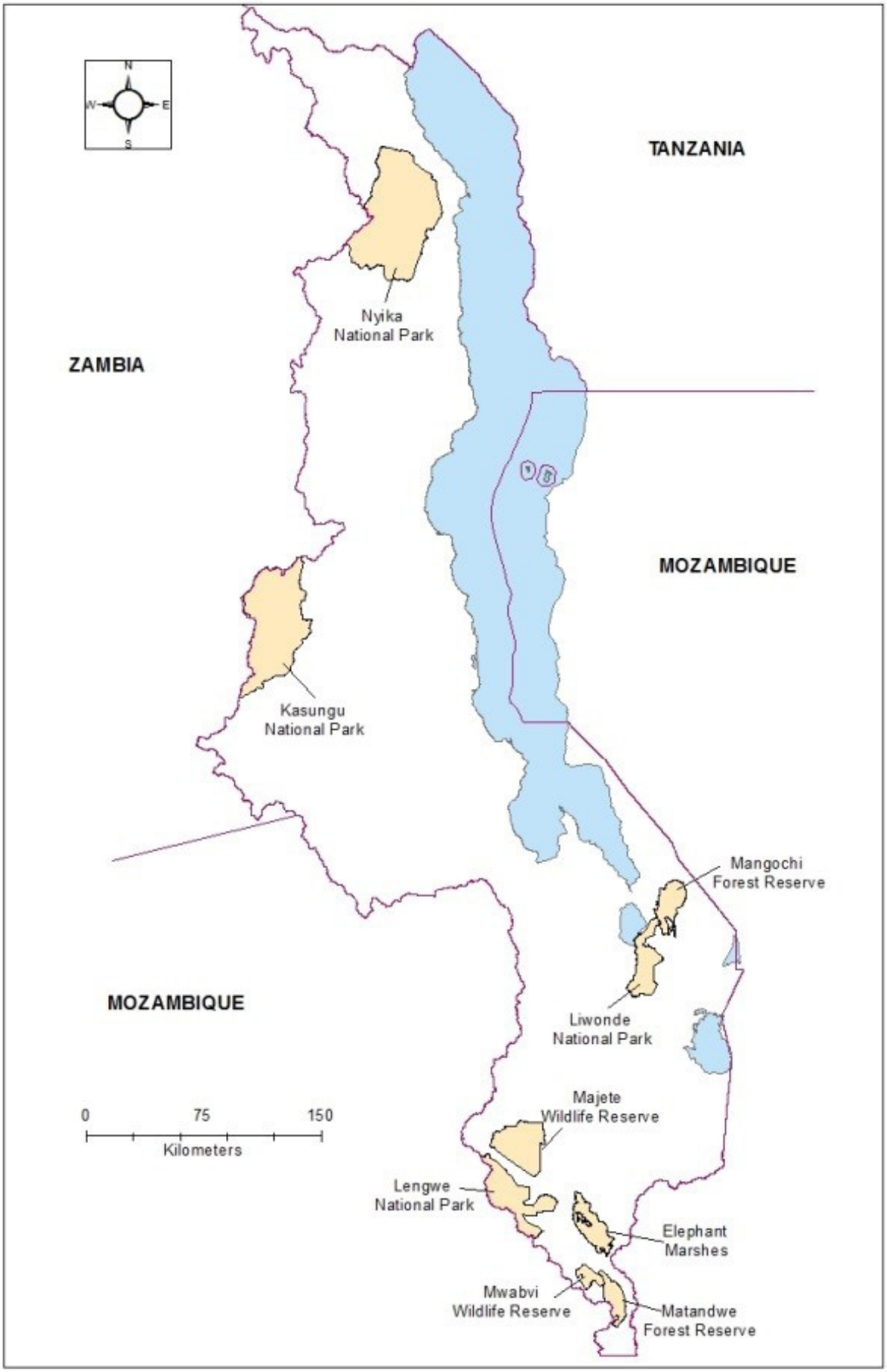

Figure 1: Map of Malawi

provide site seeing, photographic safaris and mountain hiking opportunities. Lake Malawi National Park, for example, is of global importance for biodiversity conservation particularly due to its fish diversity. It is a home to many hundreds of cichlid fish, nearly all of which are endemic to Lake Malawi, and are known locally as "mbuna."

Biodiversity is also important for food, medicinal and cosmetic purposes. For example, Lake Chilwa wetland provides food such as wild birds and fish to the surrounding communities. It is estimated that more than 500,000 people along the major fishing areas depend on fish as a source of food and livelihood in Malawi. The fisheries sector provides 60-70% of total animal protein and 40% of total protein supply in Malawi.

Malawi's plant diversity is important as traditional medicine and its extracts are used for pharmaceuticals, agricultural products and in cosmetics. Malawi has over 131 plant species that are used as medicinal plants. For example, the red fiber of the Baobab fruit (*Adansonia digitata*) has high anti-oxidant levels, which makes it particularly important as a nutraceutical. The fruit powder from Baobab is also used as a food ingredient and has industrial applications ranging from juices, cereals, ice creams, dairy products or confectioneries.

Furthermore, biodiversity provides ecological services such as recycling of nutrients, control of local microclimates, regulation of local hydrological processes, regulation of the abundance of undesirable organisms and detoxification of noxious chemicals.

1.3 STATUS AND TRENDS OF BIODIVERSITY

Generally, the status of biodiversity in Malawi is declining. Terrestrial and aquatic ecosystems of the country are being modified and degraded and species composition is being altered due to unsustainable utilization and management of natural resources. This section provides information on ecosystems, species and genetic diversity in Malawi.

1.3.1 Ecosystem Diversity

1.3.1.1 Terrestrial Ecosystems

Terrestrial ecosystems in Malawi include forests, mountains and grasslands. Protected areas have the richest biodiversity, while public and community areas are characterized by general degradation of resources largely due to habitat loss and overexploitation.

Malawi has 87 forest reserves, five national parks, four wildlife reserves and three nature sanctuaries. Most of these protected areas are Important Bird Areas (IBAs). Biodiversity in the protected areas contribute significantly to economic growth and poverty alleviation. An Economic Valuation of Natural Resources in Malawi (Yaron et al, 2011) reported that tourism generated 1.8% of the country's total GDP in 2001 and 5.8% in 2007, respectively. In addition, surrounding local communities benefit from the protected areas through employment and direct consumptive use of biological resources from protected areas. For example, 4,491 people benefited from harvesting thatch grass and bamboo valued at MK 2,918,050 (US $18,238) in the Majete Game Reserve during the 2010/2011 financial year.

Malawi's forest biodiversity is under threat primarily due to increasing human population, which has led to expansion of agriculture into marginal lands and increased demand for fuel wood and charcoal by rural and urban populations resulting in the exploitation of the remaining forest resources. Dzalanyama Forest Reserve is one of the most threatened natural ecosystems in Malawi due to tobacco curing, brick burning, firewood and charcoal production (Munthali et al, 2012). The dominant land cover in the reserve between 1990 and 2000 was forest, wetlands and grassland, but by 2008, bare land had taken over

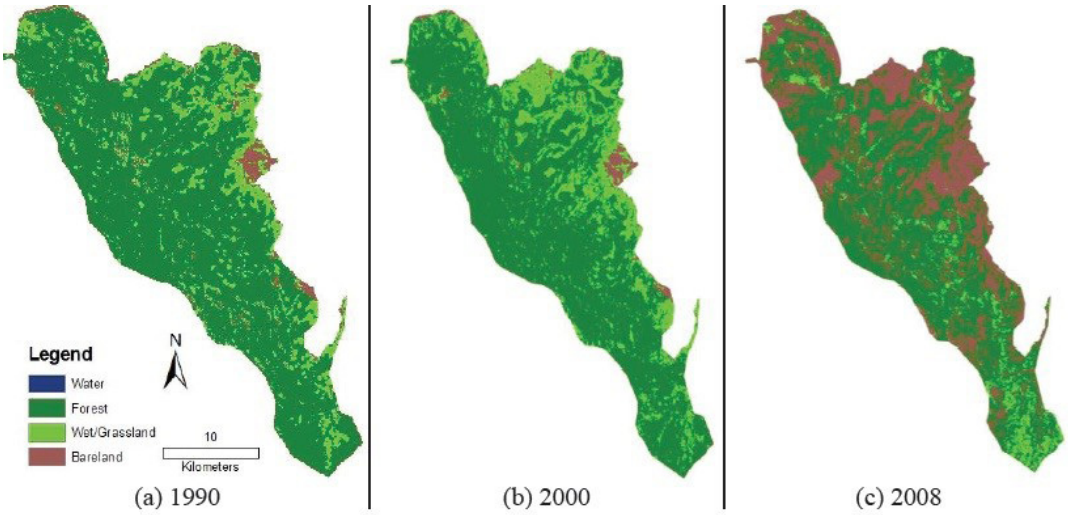

Figure 2: Land Cover Change in Dzalanyama Forest Reserve
Source: Munthali et al, 2012.

grasslands and wetlands as the second dominant land cover in the reserve as shown in Figure 2 above.

1.3.1.2 Aquatic Ecosystems

Aquatic ecosystems cover about 20% of the total surface area of Malawi and are habitats to a diversity of fish and other aquatic fauna and flora. Major aquatic ecosystems in Malawi include lakes (Malawi, Malombe, Chilwa, Kazuni and Chiuta), rivers (Songwe, South Rukuru, North Rukuru, Dwangwa, Linthipe, Shire and Bua River), wetlands and other small water bodies. Aquatic ecosystems are important in Malawi as they provide goods and services such as fisheries, agriculture, livestock grazing, ecotourism, water supply, water purification, carbon sequestration and transport, among others.

The largest aquatic ecosystem is Lake Malawi, which covers a surface area of over 29,000 km^2 and drains a catchment area of 100,500 km^2. It is the largest and most significant water body in terms of fish production in Malawi, usually contributing over 60% of the total annual landings. The level of biodiversity in the aquatic environment of Lake Malawi is very high. The fish in Lake Malawi are one of the most remarkably diverse and abundant faunal groups in the world. However, the lake ecosystem is under threat due to eutrophication from increasing multiple sources of nutrient loading from economic activities and development projects within the basin, climate change and limited implementation of appropriate management strategies that sustain productivity and fish biodiversity.

Similarly, Lake Chilwa wetland, which was declared a Ramsar site and a Man and Biosphere Reserve (MAB), is one of the aquatic ecosystems that has been affected by human population and climate change. Lake Chilwa water levels fluctuate widely due to seasonal changes in precipitation and evaporation (Jamu et al, 2011). These fluctuations result in several water recessions, including the complete drying out of the lake in 2010.

1.3.2 Species Diversity

1.3.2.1 Flora

Malawi has a rich plant diversity, which comprises of flowering and non-flowering plants. A great diversity of species is found in national parks, wildlife reserves, forest reserves and protected hill slopes. The country has over 6,000 flowering plant species (GoM, 2010), of which 122 are endemic and 248 are threatened based on the IUCN Red Data List

(2013). However, there are more species of flora that are threatened but are not included on the IUCN Red Data List because of inadequate information about their conservation status.

Plant species are economically important in provision of timber, firewood and construction poles. Some have ornamental value whilst others are used for medicinal purposes. Most of the plant species are found in forest reserves. Effective management of these forest species is achieved through collaborative efforts by both government and Non-Governmental Organizations (NGOs). Control measures currently being implemented include regular patrols to prevent encroachment and theft of forest produce;and protection from bush fires. These measures are not fully implemented due to inadequate financial and human resources.

In addition, Malawi grows a wide range of cereals, pulses and tubers. Comprehensive surveys conducted on maize, sorghum and finger millet indicated that even though most of the local varieties for these crops have been lost from the communities, the National Genebank has preserved them. Mushrooming of hybrid varieties has contributed to loss of local crop varieties from farming communities. Some of the varieties that have been lost include: "kanjerenjere" (early maturing maize variety) "kamchiputu" (aromatic sweet potato), "saopaalendo" (fast cooking bean variety) and a number of indigenous vegetables. Other factors that have led to loss of local crop land races from the communities include: habitat loss and fragmentation, human population increase, deforestation, lack of policy on conservation and sustainable utilization of plant genetic resources.

Production trends and research activities show that the following crops have been identified as neglected and underutilized: *Eleusine coracana subsp. Coracana, Vigna subterranean, Sorghum bicolor, Pennisetum glaucum, Vigna radiata, Amaranthus hybridus, Cleome gynandra, Dioscorea bulbifera, Dioscorea rotundata, Plectranthus esculentus, Moringa oleifera, Cicer arietinum, Sesamum indicum* and *Cucurbita maxima*. These species have a high nutritive value but their diversity is decreasing considering that their production is out competed by selected few major crops (GoM, 2008).

Table 1: Species Diversity in Malawi
Source: Malawi's Fifth Report to CBD, 2014

Species	Total Species	Endemic	Threatened
Mammals	192	Not known	8
Birds	630	1	16
Amphibians	83	6	12
Reptiles	145	8	8
Fish	>1,000	950	Not known
Insects	8770	Not known	8
Microorganisms	700	Not known	Not known

1.3.2.2 Fauna

Malawi's ecosystems contain a remarkable diversity of fauna. Table 1 below shows species diversity, endemism and their conservation status.

As seen from Table 1, endemism is highest in fisheries and relatively low in birds, amphibians and reptiles, whilst in mammals, insects and microorganisms it is not known. Lake Malawi alone inhabits over 1,000 fish species belonging to 65 genera and 11 families. Fisheries are an important sector of Malawi's economy.

Fish landings have been declining over the years mainly due to overfishing in shallow waters. Figure 3 below indicates the catches of fish for the past four years in Lake Malawi.

From Figure 3, it can be noted that Chambo (*Oreochromis* species) catches decreased from 2,237 in 2010 to 1,501 in 2013 representing a 67% decrease. This could be attributed to the fact that Chambo is the most highly demanded fish on the market. As such, it is overexploited for economic gains. It can also be noted from Figure 3 that Usipa, (*Engraulicypris engraucyprisardella*) followed by Utaka (*Capadichromis* species), which are smaller fishes, have assumed high catches over the period. Though much research has not been conducted to establish the causes of this great species change, the dwindling stocks of larger fishes, especially Chambo, is

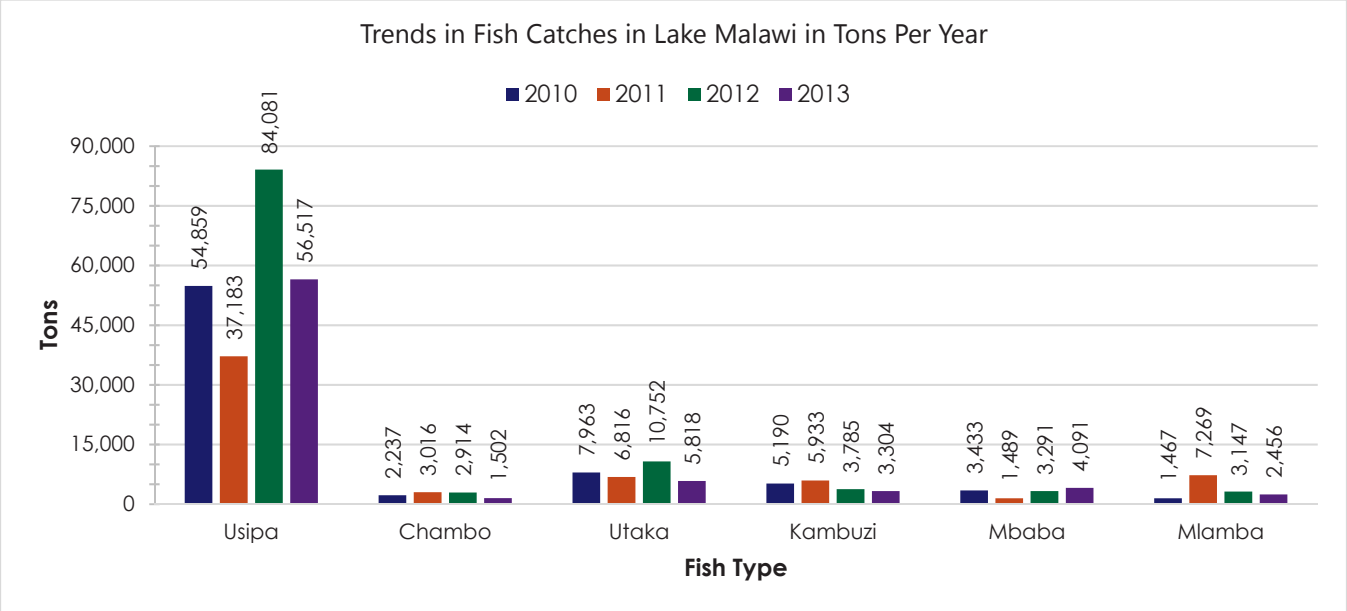

Figure 3: Trends in Fish Catches in Lake Malawi in Tons Per Year

Table 2: Comparative Figures of Large Mammal Populations in Nyika National Park for 2009 and 2013

Species	2009 Survey Results	2013 Survey Results
Elephant	0	47
Eland	656	625
Roan	341	461
Zebra	112	279
Reedbuck	471	1,787
Bushbuck	10	51
Warthog	24	106
Duiker - Common	10	93
Duiker - Red	0	2
Bushpig	18	0
Klipspringer	0	10
Total	1,642	3,461

a result of illegal fishing as well as overfishing. The enormously high catches of the smaller fishers like Usipa are mainly to do with changes in the trophic ecology of the lake environment. The predators of these species such as Ncheni have reduced in number over the years whereas their prey, mainly lakeflies, have increased in numbers and also occur more frequently than they used to do in the recent past.

Mammal species, on the other hand, have undergone a severe decline in numbers, especially in recent years, mainly due to poaching and habitat loss. The Government is however taking several initiatives to increase the mammal populations in protected areas. The population census conducted in Nyika National Park in 2013 revealed that there was an increased trend in some large mammals in the park, as shown in Table 2 above. This is attributed to the Nyika Vwaza Transfrontier Project, which is aimed at sustainably managing the Nyika Vwaza Conservation area.

1.3.3 Genetic Diversity

Malawi has been selecting, domesticating, improving and using species that are valuable for agricultural, pharmaceutical and industrial functions. The country, however, has been experiencing genetic erosion mostly on agriculture species. In other species, the challenge has been inadequate taxonomic information on what is available. Genetic diversity is usually available in local land races. Genetic resources of different species are conserved at the Malawi Plant Genetic Resource Centre (MPGRC), Agricultural Research Stations, Botanical Gardens, Academic Institutions and the Forestry Research Institute of Malawi. For instance, the MPGRC has over 2,513 accessions from 32 species. Of these, 2,344 are seed samples and 169 are vegetative materials collected from all districts of Malawi (MPGRC report, 2013). A great deal of genetic resources used for food agriculture are also conserved on-farm by farmers and some are conserved in Community Seed Banks by non-governmental organizations that work with farmers such as the Biodiversity Conservation Initiative (BCI).

Malawi's animal genetic resources comprise ruminant livestock, mammalian monogastrics and poultry. About 95% of the livestock are of the indigenous type, which has low fertility and growth performance, low milk yield (1 liter/day for cattle) and small body sizes. These species are at risk of genetic erosion due to uncontrolled crossbreeding

programmes, stock thefts and diseases. There are also smaller populations of exotic breeds and their crosses, which are mainly on large/ commercial farms. The indigenous Malawi Zebu cattle account for more than 90% of all cattle found in Malawi.

Among domesticated small livestock, goats (*Capra hircus*) are the most popular in Malawi. The indigenous local goats are abundant, whilst the Boer goat is rare. Sheep (*Ovis aries*) are present in three genotypes in Malawi, the indigenous (local) types, the Dorper (an introduced breed from South Africa for mutton) and the Dorper crosses. The local sheep are highly abundant, the Dorper crosses being less abundant and the Dorper breed is extremely less abundant.

Poultry species raised in Malawi include chickens, pigeons, ducks, guinea fowls and turkeys. Data from the Ministry of Agriculture, Irrigation and Water Development (MoAIW) shows an increasing trend for chickens, guinea fowl and ducks but decreasing numbers for turkeys (GoM, 2010).

1.4 THREATS TO BIODIVERSITY

The threats to biodiversity in Malawi are mainly human induced and include habitat loss, over-exploitation of biological resources, pollution, Invasive Alien Species (IAS) and climate change.


Photo Credit: Tiffany Loveridge

1.4.1 Habitat Loss and Fragmentation

Over the past years, increasing human population and economic development have led to several land use changes in Malawi that have driven biodiversity loss. Malawi's human population was estimated at 13 million in 2008 and is projected to reach 20 million by 2020 (NSO, 2008). This high population growth has created a demand for settlement and agricultural land as well as natural resources such as fisheries and forest resources. This has


Photo Credit: Colin Martin

resulted in loss of habitats and species diversity, which is mainly driven by deforestation. The major causes of deforestation include indiscriminate cutting of trees, commercial harvesting and conversion of forest land to settlement and agriculture. Alternative land uses for urban development, agricultural expansion, infrastructure development and mining have also contributed to reduction or degradation of important habitats and ecosystems in the country.

Bushfires are also a major contributing factor to habitat destruction leading to changes in species composition of both flora and fauna. The problem is mainly pronounced during the dry season when the temperatures are high and the vegetation is flammable. The occurrence of bushfires has impacted negatively on the grazing land for both domestic and wildlife species. Some of the major causes for bushfires include mice hunting and uncontrolled burning for farming.

The Ministry of Natural Resources, Energy and Mining is sensitising communities and the general public on the dangers of bushfires through public awareness campaigns under the Sustainable Land Management (SLM) and Environment and Natural Resources Management (ENRM) Projects. Through these sensitisation initiatives, communities are involved in bushfire control by establishing fire fighting groups, formulating by laws and construction of firebreaks. The projects also train communities in bee keeping to provide alternative sources of income to charcoal burning and to encourage communities to conserve biodiversity.


Photo Credit: Molly Cheatum

1.4.2 Over-Exploitation of Biological Resources

Rapid population growth in Malawi has increased demand for resources, which has led to overharvesting of natural resources like forests and fisheries. In the fisheries sector, for example, reports indicate that the number of fishermen operating in Lake Malawi alone has risen by 124% in the past decade, bringing the total number of fishermen to over 50,000. Fish stocks in Lake Malawi in the last two decades increased from about 30,000 metric tonnes per year to 80,000 per year in 2010 due to enormously high catches of Usipa and Utaka. The large-sized species have, on the other hand, continued to decline. One of the species most affected by the decline is Chambo (*Oreochromis species*), an endangered species. This species has been hugely over fished, with an estimated 70% reduction in the population over the past 10 years (Jamu et al, 2011).

Forest resources, on the other hand, have been overexploited because of an increasing demand for biomass energy, which is the main source of energy in Malawi. The 2008 population and housing census revealed that 43% of all households in urban areas use charcoal for cooking, 41.8% use firewood and only 13.6% use electricity (NSO, 2008). Approximately 1.4 million cubic meters of wood, equivalent to 15,000 hectares of trees, are cut per year to produce 6.08 million Standard bags of charcoal in the four major cities of Malawi (Kambewa et al., 2007). The clearing of vast amounts of forests for charcoal production has led to alteration of species compositions in the forests, as most of the trees favoured for charcoal production have been removed, leaving behind woodlands of lower quality (Kambewa et al., 2007). This has resulted in loss of species important for use in

traditional medicine, timber and food.

1.4.3 Invasive Alien Species

Invasive alien species (IAS) in Malawi cover both terrestrial and aquatic ecosystems and are in the form of plants, animals and microorganisms. One of the most notable invasive alien species in Malawi is water hyacinth (*Eichhornia crassipes*), notable for its economic implications and detrimental effects on biodiversity by reducing oxygen content in the aquatic ecosystems. Water hyacinth is widely spread in Shire River where it affects the generation of hydroelectric power and irrigation programs, hindering economic development of the country in the process. The Malawi Compact Environment and Natural Resource Management Project estimates that power shut downs resulting from weeds including water hyacinth, are estimated to cost US $27,000 per day and lead to industrial losses worth ten times this amount. In addition, damage to infrastructure in 2001 due to invasive alien species and debris cost US $12 million to repair. Measures to control water hyacinth started in the 1990s, when its impacts on the country's water courses became serious. The Environmental Management Project, with funding from the World Bank, provided inputs into the control of water hyacinth in the Shire River, Lake Malawi and Lake Malombe. The programme provided resources to acquire and raise bio-control organisms, to train members of local communities in the release of these agents in infested areas, to manually remove the alien plant where it was abundant and to conduct awareness campaigns through the production of posters. While this and several other initiatives have succeeded in minimizing water hyacinth infestations in major watercourses, infestation of the alien plants in localized areas and private dams is still prevalent.

Other IAS like *Pinus patula* (pine), *Rubus elipticus* (Himalayan raspberry) and *Pteridium aquillinum* (Bracken fern) are found on Mulanje Mountain and Nyika National Park. *Pinus patula* was introduced on Mulanje Mountain as a nursery crop to nurture the Mulanje cedar, but eventually became necessary to maintain it in pure stands to increase timber production in Malawi. Over time, mature *Pinus patula* started shedding seed that germinated and became invasive, hindering indigenous plant species growth. By June 2012, the Government, through the Mulanje Conservation Trust (MMCT), made a great achievement in the eradication of *Pinus patula*, where over 300 hectares of pine have been cleared. Bracken fern, on the other hand, has widely spread on Nyika National Park, the biggest National Park in Malawi, where it has invaded grasslands important for wildlife grazing and tourist attraction.

The agriculture sector has also been affected by several invasive alien species, including cassava mealy bug, cassava green mite, larger grain borer and spotted stalk borer that have caused great losses in agricultural production.

For Malawi to better manage invasive alien species there is a need to conduct comprehensive assessment and documentation of IAS and establish a programme with the primary goal of detection, quantifying the possible risk and warning managers before a respective alien species spreads beyond its point of initial introduction. There is also a need to put in place a monitoring system and conduct a risk assessment to predict the likelihood of a particular species becoming invasive, as well as come up with a means to report, verify the identifications and warn of new sightings.

1.4.4 Pollution

Biodiversity in Malawi is also threatened by pollution from agricultural runoff, sewage and industrial wastes. Currently over 70% of the farming population in Malawi uses inorganic fertilizers to enhance agriculture productivity. This type of reliance on chemicals for agricultural production has a negative ecological impact on habitats like

water and soil, which are continuously being contaminated.

Toxic substances and domestic or commercial sewage have also affected biodiversity in Malawi. Previous research on stream water and effluent from wastewater treatment plants in Blantyre revealed high phosphate levels ranging from 50 mg/l to 250 mg/l, (Sajidu et al., 2007). These phosphate levels, which are likely to be higher now, stimulate excessive growth of plants and toxic cyanobacteria in stagnant receiving water bodies, hence posing a threat to aquatic life and water quality. A study to monitor the concentrations of sulphate, sodium, magnesium, calcium, chloride, iron, nitrate and total dissolved solids in some rivers in Malawi showed that the concentration of these parameters increased towards the dry season and that these chemicals were more pronounced in the intestines and the liver of most fish, thereby threatening their survival (Kumwenda et al, 2012).

Pollution of rivers and other water bodies is also as a result of poor waste management in the cities. For example, only 30% of the total wastes generated (20,754 tonnes) in Lilongwe city is collected (UN Habitat, 2010) and the rest ends up in rivers or land where it is washed away when it rains. In some places like Kauma in Lilongwe, sewer wastes have been reportedly discharged directly into the rivers without being treated.

Although air pollution is not yet a big environmental problem in Malawi, generally,


Photo Credit: Wildlife Environmental Society of Malawi

in major urban areas gaseous emissions from industries, car exhaust fumes as well as burning of old tires pollute the air. In the rural areas, uncontrolled bushfires also pollute the air apart from destroying vegetative cover. Air pollution also arises from quarrying and coal mining activities (GoM, 2008). With the increased scope of these activities, air pollution could be a serious problem for biodiversity in Malawi in the coming years.

Government has been implementing several programs to control pollution in the country. The notable ones include the setting up of standards on pollution control and waste management and reduction in the tonnage of ozone-depleting substances such as chlorofluorocarbons from 5.9 tonnes in 2005 to almost zero in 2010 (Ozone Secretariat, 2015).

1.4.5 Climate Change

Malawi is vulnerable to adverse effects of climate change. Floods and droughts are the most common occurrences that affect biodiversity in the country. Climate change, together with other drivers like siltation, is responsible for the declining water levels or even drying up of water bodies, resulting in low fish production. Severe droughts that have occurred over the years have caused major fish habitats like Lake Chilwa wetland to dry up in some years, leading to losses in fish stocks. Through the National Climate Change Program, the Sustainable Land Management and ENRM programs, the government has been sensitizing people on the need to replace tree cover in fragile ecosystems to ensure that the occurrences of floods are reduced in the rainy season.

Changes in the rainfall pattern have affected the planting period, making it difficult for indigenous crop varieties to survive. This has resulted in more people planting hybrid seed and other improved varieties, thus threatening the maintenance of indigenous seed varieties. For example, in the year 2012,

70% of groundnut cultivation was under improved varieties, most of which have a short maturation time, whilst only 30% was under indigenous varieties (ICRISAT report, 2013). If this kind of trend continues in most crops, indigenous crop varieties that carry unique genetic traits could be eroded in the near future. In some instances, promotion of improved crop varieties to ensure high yields per hectare has led to genetic erosion where improved varieties have completely replaced local varieties.

Although not scientifically proven, climate change impacts appear to affect Malawi's fragile ecosystems, such as the montane forests. For instance, higher and previously cooler places on Mount Mulanje have become warmer and species compositions are changing, allowing low-altitude plant species to flourish. This may have direct result in the loss or poor performance of species that are adapted to cold temperatures like the Mulanje cedar (Nangoma, personal communication, 2014).

1.5 LEGAL AND INSTITUTIONAL FRAMEWORK

1.5.1 Policies and Legislation

Biodiversity management is not governed by single framework legislation in Malawi. However, appropriate umbrella policies and legislation have been formulated to address the problems and challenges of sustainable biodiversity management. These legal instruments include the Constitution of the Republic of Malawi, 1995; National Environmental Policy (NEP), 2004; and the Environment Management Act (EMA), 1996. Other sectoral policies/legislation relevant to the implementation of biodiversity programs in Malawi include: the National Forestry Policy, 1996; National Forestry Act, 1997; Fisheries and Aquaculture Policy, 2001; Fisheries Conservation and Management Act, 1997; Wildlife Policy, 2000; National Parks and Wildlife Amendment Act, 2004; National Land Resources Management Policy and Strategy, 2000; The National Herbarium and Botanic Gardens Act, 1987; Water Resources Act, 1969; Irrigation Policy, 1998; Energy Policy, 2002; Biosafety Act, 2002; Biosafety (Genetically Modified Organisms) Regulations, 2008; National Biosafety and Biotechnology Policy, 2008; Patents Act, 1986; National Monuments and Relics Act, 1965; Plant Protection Act, 1969 and Local Government Act, 1998. Table 3 on the following page highlights some of the legislation, their gaps and areas of conflict that prevent effective regulation of biodiversity conservation in Malawi.

1.5.2 Institutional Framework

Malawi has an institutional arrangement aimed at creating an enabling environment for implementation of the Convention on Biological Diversity (CBD) and other biodiversity-related conventions. The current arrangement includes the central and local government levels through which relevant statutory corporation and non-governmental organizations participate. The organizations are linked through committees and focal points at various levels.

At policy level, the Cabinet Committee on Natural Resources and Environment (CCNRE)

Table 3: Provisions and Gaps on Biodiversity in Some ENRM Policies in Malawi

Policy	Provisions for Biodiversity	Gaps/Area of Conflict in Policy
The National Herbarium and Botanic Gardens Act (1987)	The Act provides for the development and management of herbarium and botanic gardens as national heritage for Malawi and the establishment of the National Herbarium and Botanic Gardens of Malawi.	
Museums Act (1989)	Provides for the establishment of Museums. It also provides for the collection, conservation, safeguarding, documentation, interpretation and communication on the tangible and intangible heritage of people and their environment for the purposes of study, education and enjoyment.	The role of museums in conserving natural history in and ex situ is not clearly explained.
Environmental Management Act (1996)	The Act provides for the establishment of environmental protection areas and conservation of biological diversity and access to genetic resources. It also makes the provision of preparation of the National Environment Actions Plans (NEAPs), conducting EIA, pollution control and waste management.	The Act does not have regulations to enforce its provisions on access to genetic resources.
Forest Act (1997)	Provides for the conservation and management of forests.	Section 46 of the Forestry Act prohibits domestic use of forest resources except with written consent, while Section 4 of the EMA permits exploitation of resources for domestic use without prior written authority. The Forestry Act is under revision.
Fisheries Conservation and Management Act (1997)	To strengthen institutional capacity by involving various stakeholders in the management of fisheries; promotes community participation and protection of fish; and provides for establishment and operation of aquaculture.	Section 3(7) of the Fisheries Conservation and Management Act does not recognize water officials as fisheries protection officers. Section 20 and 21 of the Fisheries Conservation and Management Act are silent on EIA in granting of an aquaculture permit. The Act is being revised.
Land Policy (2002)	Promotes community participation and public awareness at all levels to ensure environmentally sustainable land use practices and good land stewardship; advocates for protection of sensitive areas and waste management	
The Science and Technology Act (2003)	The Act provides for the advancement of science and Technology in Malawi, which includes research in biodiversity and biotechnology	There are no regulations to implement the Act.
National Parks and Wildlife Act (2004)	The Act provides for wildlife management, including identification of species that should be designated for protection.	

Policy	Provisions for Biodiversity	Gaps/Area of Conflict in Policy
Water Resources Management Policy (2004)	The overall policy goal is to ensure sustainable management and utilisation of water resources in order to provide water of acceptable quality and of sufficient quantities, ensure availability of efficient and effective water and sanitation services that satisfy the basic requirements of every Malawian and for the enhancement of the country's natural ecosystems.	The policy does not provide guidelines for the conservation and sustainable use of aquatic biodiversity.
National Environmental Policy (NEP, 2004)	Seeks to manage, conserve and utilize biological diversity for the preservation of national heritage.	The policy, does not specifically address the issue of fair and equitable sharing of benefits arising from use of biological and genetic resources.

informs the cabinet on biodiversity issues to seek political guidance and support. They are supported by the Parliamentary Committee on Natural Resources and Climate Change (PCNRCC). These Committees get policy direction from the National Council on the Environment (NCE). The Technical Committee on the Environment (TCE) advises the NCE on technical issues and operates through working groups and steering committees. The National Biodiversity Steering Committee (NBSC) provides guidance to sectors involved in biodiversity management. At the local level, the District Environmental Sub-Committees (DESC) coordinate biodiversity issues in the district and Village Natural Resource Management Committees (VNRMCs) coordinate biodiversity activities at the community level.

The challenge that most of these committees face is the unavailability of funding to conduct frequent meetings and report on the various activities being implemented in their institutions. Meetings conducted are usually ad hoc to respond to emergency issues. Moreover, the monitoring and evaluation systems are not in place to track progress of implementation of their representative institutions.

1.5.3 Financing Mechanisms

Apart from establishing the various institutions responsible for biodiversity management, Malawi has a financing mechanism, the Environment Management Fund (EMF), as provided for in the EMA. However, capitalization of the EMF is often too small to sustain meaningful implementation of biodiversity activities. Implementation of the NBSAP has mostly depended on donor support. Several donors, including the Royal Norwegian Embassy, the United States Agency for International Development (USAID), the Food and Agriculture Organization (FAO), Irish Aid, Japanese International Cooperation Agency (JICA) and many others have been financing biodiversity conservation in the country. But the financial support provided has not always been adequate to achieve the targets set in NBSAP I. In this Strategy, a resource mobilization plan has been developed to help identify adequate funding for its implementation.

1.6 BIODIVERSITY MAINSTREAMING

The Malawi Millennium Development Goals Assessment Report (2013) identified that loss of biodiversity and degradation of natural resources are some of the barriers to the achievement of Millennium Development Goals. This is so because sectors like agriculture, energy, trade, manufacturing and irrigation that have a potential to promote economic development and reduce poverty

are greatly affected by biodiversity loss. At the same time, actions taken to attain economic development and poverty reduction contribute to biodiversity loss. The inclusion of biodiversity as a priority in MGDS II is a step towards preventing biodiversity loss.

Apart from the MGDS II, considerations for biodiversity have been integrated in most Government sectoral policies, especially those that trigger land use changes like the agriculture, land, irrigation and mining policies. These sectors are required by law to conduct Environmental Impact Assessments (EIA) prior to implementing projects that have potential impacts on biodiversity. These sectors have thus incorporated these requirements into their policies by providing the need to reduce negative impacts on biodiversity when implementing their activities. Some sectors have even gone further to produce sectoral strategies on how they will conserve biodiversity. For example, the agriculture sector has produced the draft Agrobiodiversity Strategy, which highlights how the sector will conserve biodiversity. Furthermore, the Malawi Plant and Genetic Resource Center under the Ministry of Agriculture and Food Security is a custodian of plant genetic resources, particularly those that are used for food and agriculture. The irrigation sector, on the other hand, through national programmes like the Irrigation, Rural Livelihoods and Agriculture Development (IRLAD), implements environmental safeguards that promote biodiversity conservation.

In addition, the Government of Malawi Decentralized Environmental Management Guidelines integrate biodiversity considerations in the District Environmental Plans. Local Environmental Committees are engaged in formulation of these plans, which form part of the District Development Plan. Through these plans, biodiversity is implemented in all sectors at the local level. As such, projects from other organizations are scrutinized at the local level to ensure that they do not have negative impacts on biodiversity.

Furthermore, Lilongwe City Council is developing a Local Biodiversity Strategy and Action Plan (LBSAP) that highlights particular species and habitats to be protected in the city and how biodiversity and development can go together with the city's development activities.

Even though efforts are being made to ensure that biodiversity is mainstreamed in different sectors, biodiversity loss is still on the rise. The major underlying cause is that important ecosystems in Malawi have not been adequately mapped out and valued; hence policy makers are not well informed as to how much biodiversity contributes to the economy.

1.7 PROCESS OF DEVELOPING THE NBSAP II

The process of preparing NBSAP II was coordinated by the Environmental Affairs Department, which is the national focal point for the CBD. A number of steps were followed during preparation, including stakeholder mapping; formation of a multi-sectoral task team; assessment of the status, trends and threats of biodiversity; and stakeholder consultations. Comprehensive desk reviews of the NBSAP I and other relevant documents were done to identify strategic and implementation gaps that would be addressed by NBSAP II. The challenges and lessons learnt in the implementation of NBSAP I have been highlighted in section 1.8.

To promote participation of stakeholders in the process (outlined in Annexe 1), a number of workshops were conducted to generate views from government departments, academia, non-governmental organisations and the private sector. In addition, the draft NBSAP II was presented to stakeholders at two national workshops. During the consultation process, the following issues and constraints affecting biodiversity management were identified and are addressed in this strategy:

- Inadequate human and institutional capacity to identify, monitor and manage biodiversity and ecosystems;
- Inadequate research in biodiversity-related issues;
- Inadequate public awareness and community participation on biodiversity management;
- Lack of framework legislation on biodiversity;
- Weak enforcement and implementation of existing legislation related to biodiversity;
- Weak co-ordination between and within institutions dealing with biodiversity management;
- Inadequate funding for biodiversity-related programmes;
- Lack of capacity to access financial resources provided via the financing mechanism of the Convention;
- Inadequate infrastructure and equipment for biodiversity management;
- Inadequate appropriate measures for conservation of natural ecosystems and species, restoration of degraded ecosystems and recovery of threatened species;
- High increase in the spread of invasive alien species;
- Lack of mechanisms for equitable sharing of benefits arising from the use of biological resources;
- Increasing numbers of threatened species and populations;
- Lack of integration of the conservation and sustainable use of biodiversity within the overriding priorities of the country's economic, social development and poverty reduction programmes;
- Inadequate classification of important biodiversity ecosystems; and
- Low linkage between the CBD program of work and the NBSAP, such as Program of Work on Protected Areas (POWPA).

The NBSAP process developed 16 targets and corresponding actions. It further came up with action plans to determine responsible organizations, timeframes and implementation arrangement.

1.8 LESSONS LEARNT FROM IMPLEMENTATION OF NBSAP I

Malawi's first NBSAP has been used as a guiding document for institutions working in the field of biodiversity management, and positive progress has taken place in implementing some of the strategies that it outlined. A number of conservation programmes and projects for specific biodiversity components have been developed as a step towards implementation of the strategy. Progress has also been made in the advancement of Public-Private Partnerships in National Parks, which has led to the quick reintroduction and restocking of important animal species in Malawi. For example the concession of Majete Game reserve to African Peace Parks has led to the introduction of nearly extinct species such as the rhino. Although there has been significant progress in implementation of some of the planned actions in NBSAP I, some targets were not met. For example, the red data list was not updated as planned. Most of the targets that were not met during NBSAP I implementation have been revised and incorporated into NBSAP II.

1.8.1 Implementation Obstacles Coordination

Malawi is diverse with complex ecosystems and a wide range of resources and users, which are governed by multiple managers following an array of national laws, policies and guidelines, as well as regional and international conventions, agreements and protocols. Responsibilities for biodiversity conservation are dispersed across sectors and not coherently articulated. Land use management strategies exist within the various governing institutions, from local to national levels, but these are parochial and do not specifically address biodiversity conservation. Guiding/policy instruments are spread amongst numerous implementing government bodies, which often do so without

considering the implications for the NBSAP. The instruments themselves conflict with one another and with the principles of sustainable development and resource use.

The complexity of this situation indicated that a strong coordinating body was necessary to ensure integrated management planning. Coordination in the implementation of the NBSAP was charged to the Environmental Affairs Department. The Department does not have any jurisdiction over other Ministries, i.e. it is not able to instruct other ministries to implement NBSAP actions even though it is a national strategy. Implementation of the strategy has therefore happened more by chance in those areas where other ministries are responsible for implementation of activities.

Information

Knowledge management system that ensure information flow between researchers, resource users and managers is not available. At present there are no formalized mechanisms for exchange of biodiversity information between and among the institutions. Even though Malawi developed the Clearing House Mechanism for Biodiversity, sectors have not populated it with recent data.

Institutional Capacity

Within local authorities and regulatory bodies, the number of staff technically qualified to collect, analyse, interpret and act on biodiversity data is often insufficient and existing staff are frequently needed to fulfil other critical duties. Institutions where this capacity exists are not currently well incorporated into the planning and policy process. Academic institutions mostly conduct ecological research and interaction between researchers, users, managers and communities is limited. Scientific findings are therefore rarely used to inform management decisions, particularly in relation to biodiversity. Baseline biodiversity data are limited and not integrated into management procedures, which inhibits the ability to understand land use impacts and detect resource and biodiversity trends.

Awareness

Public awareness about biodiversity and the NBSAP is generally low in all sectors. For example, during consultations, most of the respondents claimed to have been seeing the NBSAP for the first time. Public awareness of the extrinsic value of tourism is high, but there is little awareness of the relationship between human activities and biodiversity, and the concept of limiting natural resource use and growth in the agricultural sectors is not understood. This lack of awareness is apparent at all levels of society, from government through to individuals.

Funding

The biggest challenge to implementation of activities in NBSAP is availability of funding. Even when funding is available it is often difficult to get donors to invest in basic taxonomic research or long-term biodiversity monitoring schemes, which are priority areas within the NBSAP, as without baselines and trend data it is not possible to show the biodiversity status in terms of whether it is getting better or worse.

1.9 USE OF NBSAP II

The NBSAP II shall be used:

a) As a planning tool by Government, NGOs, private sector and other stakeholders to mainstream biodiversity into national development and sectoral planning processes;
b) As an instrument for investment in biodiversity conservation and/or co-ordination and support by development partners;
c) As a guiding tool for Malawi to oversee the implementation of its obligations to the CBD;
d) As a guiding tool for local councils to integrate biodiversity in their development plans; and
e) As a source of information to the general

public, researchers, private sector, civil society, NGOs and academia, among others.

Chapter Two

Strategy for Biodiversity Management in Malawi

Photo Credit: Colin Martin

2.1 VISION

By 2050, Malawi's biodiversity is valued, conserved, restored and sustainably utilized with full participation of all stakeholders.

2.2 MISSION

To effectively implement programs that minimize the loss of biodiversity in order to ensure that ecosystems are resilient and continue to provide essential services, thereby securing the quality of life and contributing to human wellbeing and poverty eradication.

2.3 GOAL

To enhance the conservation and sustainable use of biodiversity for the environment and human well-being. This goal will be achieved through the following specific strategic objectives:

a) Improve capacity and knowledge on biodiversity issues;
b) Mainstream biodiversity management into sectoral and local development plans;
c) Reduce direct pressures on biodiversity;
d) Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity; and
e) Enhance access and benefits sharing from biodiversity and ecosystem services.

2.4 GUIDING PRINCIPLES

The following principles will guide this strategy:

a) Conservation of biodiversity is a form of natural resource management whose primary goal is to meet the needs and aspirations of both present and future generations;
b) Biodiversity has an intrinsic value and is vital for agricultural, medicinal, scientific, research, tourism and other socio-economic development;
c) Every person in Malawi has the responsibility to fully participate and contribute to conservation and sustainable use of biodiversity;
d) As custodians and users of biodiversity, local communities have knowledge, skills and information that can be utilized to promote sustainable management of biodiversity;
e) Coordination among various stakeholders at all levels ensures successful conservation and sustainable use of the country's biodiversity;
f) International, regional and national cooperation, including sharing of information and appropriate technology, is crucial for the conservation of biodiversity;
g) The conservation of biodiversity is best done following the landscape and/or ecosystems approach;
h) The Government is responsible for providing direction and leadership in biodiversity management in Malawi;
i) Strategic and effective decision making on conservation and sustainable use is possible when individuals and policy makers have a better understanding and appreciation of biodiversity.

2.5 STRATEGIC OBJECTIVES, TARGETS AND ACTIONS FOR BIODIVERSITY MANAGEMENT

This section provides strategic direction and actions to be implemented by 2025 on conservation and equitable sharing of benefits arising from sustainable use of biodiversity in Malawi. The strategic goals, targets and actions are closely linked and are in line with the Strategic Plan for Biodiversity and Aichi Targets. Indicators for monitoring progress on individual targets have also been included. Explanatory and background text is provided at the beginning of each strategic goal and under each target, where appropriate. A timeline of the NBSAP II's implementation plan can be found in Annexe 2. The capacity building plan for implementation of the NBSAP II can be found in Annexe 3. Annexe 4 contains the Monitoring and Evaluation Plan,

and Annexe 5 contains the strategic plan for biodiversity 2011 - 2020 and the Aichi Biodiversity Targets.

2.5.1 Strategic Objective One: Improve Capacity and Knowledge on Biodiversity Issues

Knowledge on biodiversity is important for effective implementation of conservation programmes. However, this knowledge is mostly limited to sectors that are actively involved in the management of environment and natural resources. Such sectoral institutions include the National Herbarium and Botanic Gardens of Malawi (NHBGM), Museums of Malawi, Fisheries Department (FD), Agricultural Research Stations, Forestry Research Institute of Malawi (FRIM), Academia, NGOs and Civil Society Organizations (CSOs), among others.

Similarly, human and institutional capacities are important in biodiversity management. The Government and other organizations have made efforts to strengthen capacity on biodiversity management through training provided by institutions such as the University of Malawi (UNIMA), Mzuzu University (MZUNI), Lilongwe University of Agriculture and Natural Resources (LUANAR) and Malawi College of Forestry and Wildlife. However, there are still gaps in areas such as taxonomic issues and biodiversity accounting. Inadequate infrastructure and financial resources also affect the existence of good institutional capacity for biodiversity management.

This strategic objective seeks to build and strengthen institutional capacities and collaboration to enhance research, collections, classification, packaging, monitoring and dissemination of biodiversity information to the general public and provide financial resources to support capacity building and information management.

Target 1: By 2025, human and institutional capacity for science and technology related to biodiversity is improved

Actions

a) Establish a National Biodiversity Information Facility;
b) Update an inventory of institutions that are involved in biodiversity research and management;
c) Assess knowledge gaps and identify priority research areas;
d) Enhance institutional capacity to manage and monitor implementation of biodiversity programmes;
e) Increase the number of programmes on biodiversity research;
f) Strengthen the capacity of training institutions on biodiversity research and dissemination;
g) Strengthen human capacity to manage biodiversity.

Output Indicators

a) A National Biodiversity Information Facility Established;
b) An updated inventory of institutions involved in biodiversity issues;
c) Number of biodiversity gaps and priority research areas identified;
d) Number of institutions with capacity to carry out biodiversity research;
e) Number of biodiversity research programmes implemented;
f) Number of institutions with the capacity to manage and monitor implementation of biodiversity programs;
g) Number of people trained to manage biodiversity.

Responsible Institution: Ministry responsible for Natural Resources, Energy and Mining; National Commission for Science and Technology; Ministry responsible for Agriculture, Irrigation and Water Development; Ministry responsible for Tourism and Culture;

Museums of Malawi; NHBGM; FRIM; NGOs; CSOs; and Academia.

Target 2: By 2025, traditional knowledge, innovations and practices of local communities are respected and harnessed in line with national and international legislation

The cultural diversity of Malawi has played an important role in sustaining biodiversity throughout centuries. In most cultures, areas rich in biodiversity have been designated as sacred or protected areas for a number of reasons. For example, graveyards all over Malawi are designated as sacred and protected areas where harvesting of forest and wildlife resources is prohibited. However, most of these conservation-sensitive traditional practices, beliefs and customs are rapidly breaking down and disappearing together with the biodiversity that they may have helped to conserve. This loss of extensive traditional knowledge systems, practices and innovations is a result of changes in the socio-economic environment. The impacts of such changes on biological and cultural diversity cannot be ignored.

Despite playing a role in the conservation of biodiversity, traditional knowledge systems, innovations and practices have not been adequately promoted and documented. By achieving this target, traditional knowledge systems, innovations and practices will be valued and properly utilized.

Actions

a) Update an inventory of traditional management systems, innovations and practices in Malawi;
b) Conduct awareness campaigns among communities, researchers and NGOs to raise the profile on the value of traditional systems and knowledge;
c) Facilitate development of community protocols on traditional knowledge, practices and innovations;
d) Promote and upscale best traditional management systems.

Output Indicators

a) Inventory of tradition knowledge, innovations and practices updated;
b) Number of awareness campaigns conducted;
c) Number of community protocols developed and implemented;
d) Number of best traditional management practices promoted and up-scaled.

Responsible Institutions: Ministry responsible for Natural Resources, Energy and Mining; Ministry responsible for Tourism and Culture; Ministry responsible for Local Government and Rural Development; NHBGM; FRIM; National Commission for Science and Technology; Ministry responsible for Agriculture, Irrigation and Water Development; Museums of Malawi; Academia; Ministry of Justice; Traditional Institutions; Local Communities; NGOs; and CSOs.

Target 3: By 2025, at least 50% of the Malawi population is aware of the value of biodiversity to ensure its conservation and sustainable use

Environmental education and public awareness plays an important role in improving people's understanding of biodiversity and participation in conservation programs. Malawi developed a National Environment and Climate Change Communication Strategy (NECCCS) in 2010. The main objective of the NECCCS is to effectively and efficiently provide information, education and communication on environment and climate change issues that promote positive change for sustainable development. Despite having the communication strategy in place, there is limited knowledge on the values of biodiversity. It is important to raise awareness for active participation of organizations and individuals in biodiversity management.

Actions

a) Develop a communication, education and public awareness strategy for biodiversity;
b) Integrate biodiversity issues in primary and secondary school curricula;
c) Conduct awareness campaigns on the importance of biodiversity;
d) Promote active participation of local communities in biodiversity conservation through various Community-Based Institutions;
e) Publications to raise the profile on biodiversity in Malawi.

Output Indicator

a) A Communication Education and Public Awareness Strategy for biodiversity developed and operationalised;
b) Biodiversity integrated in primary and secondary school curricula;
c) Number of awareness campaigns conducted;
d) Number of active Community-Based Institutions;
e) Number of publications on Malawi's biodiversity developed;
f) Number of CBNRM programs on biodiversity promoted.

Responsible Institutions: Ministry responsible for Natural Resources, Energy and Mining; Ministry responsible for Information, Tourism and Culture; Media; Ministry responsible for Finance and Economic Planning and Development; Ministry responsible for Education, Science and Technology; NHBGM; Private Sector; NGOs; Ministry of Local Government and Rural Development; and Academia.

2.5.2 Strategic Objective Two: Mainstream Biodiversity into National, Sectoral and Local Development Plans

Implementation of biodiversity conservation programs is mostly done by sectors that are directly involved in environment and natural resource management. However, activities of all sectors have an impact on biodiversity. Despite their economic, social and environmental importance, biodiversity and its ecosystem services are poorly understood and undervalued. It is important that relevant sectors are aware of the value of biodiversity so that they are fully engaged to ensure protection, conservation and restoration of biodiversity.

Mainstreaming biodiversity conservation and its value into sectoral policies and accounting systems will improve the management of biodiversity in Malawi.

Target 4: By 2025, biodiversity values are integrated into national, sectoral and local development policies and plans

Malawi's economy is natural resource based and biodiversity has a high potential to contribute to the socio-economic development of the country. An economic valuation of natural resource use in Malawi established that the country is losing about 5.3% of GDP annually due to unsustainable natural resource management (Yaron et. al., 2010). It is vital to integrate biodiversity values into all development planning processes at the national and local level to realize its full potential towards the socio-economic development of Malawi.

The Malawi Growth and Development Strategy II is a medium-term strategy designed to implement Malawi's long-term aspirations as spelt out in its Vision 2020. It strives to foster more inclusive job creation growth to address unemployment and reduce poverty. This target aims to influence budget processes by providing evidence on the poverty biodiversity links and ensuring its inclusion during the revision process of the MGDS.

Actions

a) Conduct integrated ecosystem assessments and economic analyses to

evaluate the specific contributions of biodiversity to the national economy and human well-being;
b) Integrate biodiversity poverty linkages into the Malawi Growth Development Strategy III;
c) Develop guidelines on how sectors and national planners can integrate biodiversity conservation into relevant policies and plans;
d) Identify and engage sectors to integrate biodiversity conservation;
e) Develop Local Biodiversity Strategies and Actions Plans (LBSAPs).

Output Indicators
a) Evidence collected on the contribution of biodiversity to the national economy and human well-being;
b) Biodiversity poverty linkages included in the MGDS III;
c) Guidelines for integrating biodiversity into policies and plans developed;
d) Number of sectors integrated biodiversity conservation issues;
e) Number of Local Biodiversity Strategy and Action Plans developed.

Responsible Institution: Ministry responsible for Natural Resources, Energy and Mining; Ministry responsible for Tourism, Culture, Parks and Wildlife; Ministry responsible for Finance and Economic Planning and Development; NHBGM; National Commission for Science and Technology; Ministry responsible for Agriculture, Irrigation and Water Development; Ministry responsible for Local Government and Rural Development; NGOs; Private Sector; Academia; and Local Communities.

Target 5: By 2025, sustainable financing mechanisms for effective implementation of biodiversity programmes developed

The Government of Malawi and development partners are the primary source of funding that support implementation of biodiversity programmes. However, there is still inadequate financing in biodiversity management. This target seeks to develop sustainable financing mechanisms for effective implementation of biodiversity programmes.

Actions
a) Develop and implement a Biodiversity Resource Mobilization Strategy;
b) Promote and implement innovative finance mechanisms such as Access and Benefit Sharing (ABS) and Public-Private Partnership (PPP) programs;
c) Develop and implement market-based approaches for biodiversity conservation including Payment of Ecosystem Services (PES).

Output Indicators
a) A Biodiversity Resource Mobilization Strategy developed and implemented;
b) Number of ABS mechanisms and PPP promoted;
c) Number of market-based approaches for biodiversity conservation, including PES initiatives, developed and implemented.

Responsible Institutions: Ministry responsible for Natural Resources, Energy and Mining; Ministry responsible for Finance and Economic Planning; Ministry of Local Government and Rural Development; Ministry of Trade and Industry; NGOs; Academia; Malawi Revenue Authority; and the Private Sector.

2.5.3 Strategic Objective Three: Reduce Direct Pressures on Biodiversity

Malawi continues to lose its biodiversity at an unprecedented rate mainly due to human-induced causes such as deforestation, encroachment into protected areas, poaching, over fishing, bushfires, introduction of invasive alien species, pollution and climate change.

Programmes and actions aimed at protecting and restoring degraded ecosystems and

sustainably managing biodiversity will be implemented to achieve this strategic objective.

Target 6: By 2025, at least 50% of the degraded terrestrial habitats are restored and protected

Malawi's terrestrial habitats have been degraded and land use has changed due to population growth and shortage of land for agriculture. Protected areas have been encroached and species numbers are declining. This targets aims to identify the degraded habitats and restore them.

Actions

a) Identify degraded habitats;
b) Identify habitats with high species diversity;
c) Develop, review and implement strategies and programmes for restoring habitats;
d) Develop and implement programmes to protect habitats of high species diversity.

Output Indicators

a) Number of degraded habitats identified;
b) Number of habitats with high species diversity identified;
c) Number of strategies and programmes for habitat restoration developed and implemented;
d) Number of programmes to protect habitats developed.

Responsible Institutions: Ministry responsible for Natural Resources, Energy and Mining; Ministry responsible for Agriculture, Irrigation and Water Development; NHBGM; Ministry responsible for Information, Tourism and Culture; FRIM; NGOs, CSOs, Academia; and Local Communities.

Target 7: By 2025, aquatic biodiversity is managed and harvested sustainably within safe ecological limits

Management of aquatic biodiversity in Malawi has been compromised over the years. This has been mainly exacerbated by ever increasing human population, land degradation, loss of species habitats, declining water levels and limited implementation of specific regulations, among others. The exploitation regimes of the aquatic species have not paid any respect to the safe ecological thresholds. For instance, exploitation of fisheries resources has not obeyed the acceptable maximum sustainable yield (MSY) levels for most of the fish species. This target will aim to manage aquatic biodiversity and ensure that they are harvested sustainably within safe ecological limits.

Actions

a) Develop guidelines to promote integrated watershed management;
b) Develop programmes on integrated watershed management;
c) Promote use of legal fishing gear;
d) Develop a national wetlands policy;
e) Identify, rehabilitate and protect fish spawning and nursing areas;
f) Undertake ex-situ conservation of threatened or endangered aquatic species;
g) Review and implement strategies and plans for management of endemic fish species;
h) Reduce fishing effort in shallow waters by promoting deep-water fishing.

Output indicators

a) Guidelines for watershed management developed;
b) Number of programmes on integrated watershed management developed;
c) Number and type of legal water fishing gear promoted;
d) A National Wetlands Policy developed;
e) Number of fish spawning areas for

important species identified and protected;
f) Number of threatened or endangered aquatic biodiversity species conserved;
g) Number of strategies and plans for management of endemic fish species reviewed and implemented;
h) Indices of use of illegal fishing gears in shallow waters reduced

Responsible Institutions: Ministry responsible for Natural Resources, Energy and Mining; Ministry responsible for Agriculture, Irrigation and Water Development; Ministry responsible for Information, Tourism and Culture; Department of Forestry; Academia; Private Sector; NGOs; CSOs; and Local Communities.

Target 8: By 2025, area under forest cover is increased by 4% and managed sustainably, ensuring conservation of biodiversity

The Government of Malawi continues to implement actions and measures designed to conserve biodiversity in forest reserves and ensure they are managed sustainably, while monitoring their impacts and considering ways to apply such measures effectively. The National Forest Policy safeguards favourable conditions for the preservation of forest habitats for biodiversity conservation. Efforts to safeguard and manage forest biodiversity sustainably will be intensified by increasing the areas of forests under protection, improving the quality of protected forest habitats through ecological restoration and enhancing nature management methods used in commercially utilized forests.

Actions
a) Review and implement effective reforestation programmes that ensure survival and diversity of planted trees;
b) Develop and implement community-based programmes on conservation and sustainable use of forest biodiversity;
c) Promote improved forest management techniques;
d) Promote the use of alternative sources of energy.

Output Indicators
a) Number of reforestation programmes reviewed and implemented;
b) Number of community-based programmes on conservation and sustainable use of forest biodiversity developed and implemented;
c) Number of improved forest management techniques promoted;
d) Percentage of consumers adopting alternative sources of energy.

Responsible Institutions: Ministry responsible for Natural Resources, Energy and Mining; Ministry responsible for Agriculture, Irrigation and Water Development; NHBGM; Ministry responsible for Information, Tourism and Culture; FRIM; Private Sector; NGOs; and CSOs.

Target 9: By 2025, invasive alien species and their pathways are identified and prioritized for control and prevention from movement and spreading in and out of the country

When compared against the desirable outcomes, it would appear that Malawi has not made significant progress towards the eradication and prevention of entry of invasive alien species in the country. Malawi's fifth National Report to CBD (2014) reports that invasive alien species have grown in number from 29 to 31 with the inclusion of black wattle and Eucalyptus bug. Other attempts to document IAS in Malawi report numbers between 45 to 68. A proper documentation and definition of what should be regarded as invasive in the Malawian context is missing and some species that are regarded as native and welcome elsewhere in the country are regarded as invasive in other ecosystems in Malawi. For example, Mulanje Mountain alone

reports a total of 29 invasive species, 10 of which are not regarded as invasives in other parts of the country.

Invasive alien species disrupt the balance of natural ecosystems. They out-compete native species, affecting biodiversity in ecosystems. In some cases, invasive alien species may reproduce with native species and alter the gene pool, leading to hybridization and homogeneity and reducing genetic diversity. Therefore, invasive alien species and their pathways must be properly identified, controlled and eradicated.

Actions

a) Compile documentation and maps on IAS in Malawi, including an inventory of invasive alien species prevalent in the country;
b) Develop a national invasive species management plan;
c) Conduct awareness campaigns and build capacity of different stakeholders on how to identify, track and prevent IAS in their localities and on the threats of invasive alien species to biodiversity (cross-border inspection, quarantine and certification);
d) Procure and upgrade inspection infrastructure for tracking and identifying IAS in Malawi;
e) Conduct capacity-building initiatives on invasive alien species monitoring;
f) Monitor the entry and spread of invasive alien species;
g) Regulate and control movement and spreading of IAS.

Output Indicators

a) A national invasive alien species management plan developed;
b) Number of invasive alien species identified in different ecosystems;
c) Infrastructure for management for IAS procured;
d) Number of awareness campaigns and capacity-building initiatives on invasive alien species conducted;
e) Number of enforcement officers trained to monitor invasive alien species.
f) Number of IAS eradicated/area under IAS managed.

Responsible Institutions: Ministry responsible for Natural Resources, Energy and Mining; Ministry responsible for Agriculture, Irrigation and Water Development; FRIM; NHBGM; Academia; Ministry responsible for Trade and Industries; Malawi Revenue Authority; National Commission for Science and Technology; CSOs; and Local Communities.

Target 10: By 2025, pollution is reduced to minimize ecosystem degradation and biodiversity loss

Pollution is one of the major threats to biodiversity in Malawi. Implementing the following actions will help to minimize ecosystem degradation and biodiversity loss resulting from pollution.

Actions

a) Procure equipment for monitoring environmental pollution;
b) Conduct capacity-building initiatives on monitoring of environmental pollution;
c) Develop and implement polluter pays principle regulations;
d) Develop programs to promote the reduction, reuse and recycling of wastes;
e) Promote public-private partnerships on waste management;
f) Strengthen enforcement of policy and regulatory frameworks for pollution control.

Output indicators

a) Number of pieces of equipment for monitoring of environmental pollution procured;
b) Number of capacity-building initiatives on monitoring of environmental pollution;
c) Regulations on polluter pays principle developed and implemented;
d) Number of programs to promote

reduction, reuse and recycling of wastes developed;
e) Number of public-private partnerships on waste management promoted;
f) Enforcement of policy and regulatory frameworks for pollution control strengthened.

Responsible Institutions: Ministry responsible for Natural Resources, Energy and Mining; FRIM; Ministry responsible for Agriculture, Irrigation and Water Development; NHBGM; Academia; Ministry responsible for Trade and Industries; Malawi Revenue Authority; Malawi Bureau of Standards; CSOs; City Assemblies; and Local Councils.

Target 11: By 2025, anthropogenic pressures on vulnerable ecosystems are minimized, thereby improving ecosystems resilience to climate change

There is ample evidence that climate change affects biodiversity. According to the Millennium Ecosystem Assessment (2005), climate change is likely to become one of the most significant drivers of biodiversity loss by the end of the century. Climate change is already forcing biodiversity to adapt either through shifting habitat, changing life cycles, or the development of new physical traits.

Conserving natural terrestrial and freshwater ecosystems and restoring degraded ecosystems (including their genetic and species diversity) is essential for the overall goals of both the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change. Ecosystems play a key role in the global carbon cycle and in adapting to climate change, while also providing a wide range of ecosystem services that are essential for human well-being and the achievement of the Millennium Development Goals. Biodiversity supports efforts to reduce the negative effects of climate change. Conserved or restored terrestrial habitats increase the area for carbon dioxide sink. This target will aim to minimise anthropogenic pressures on vulnerable ecosystems to ensure that ecosystems are resilient to climate change.

Actions
a) Promote alternative energy sources to fuel wood and charcoal;
b) Promote sustainable livelihood programs such as bee keeping and mushroom production;
c) Identify and promote REDD+ program;
d) Promote afforestation programmes;
e) Promote initiatives on payment of ecosystem services;
f) Promote enforcement of legislation.

Output Indicators
a) Number of alternative energy sources promoted;
b) Number of sustainable livelihood programs promoted;
c) Number of REDD+ programs identified and promoted;
d) Number of afforestration programmes promoted;
e) Number of initiatives on payment of ecosystem services promoted;
f) Enforcement of legislation promoted - number of court cases; number of fines.

Responsible Institutions: Ministry responsible for Natural Resources, Energy and Mining; Ministry responsible for Agriculture, Irrigation and Water Development; Ministry responsible for Information, Tourism and Culture; NHBGM; Private Sector; NGOs; CSOs; and Academia.

2.5.4 Strategic Objective Four: Improve the Status of Biodiversity

Plant and animal species are threatened by habitat loss through urban expansion, human population growth, clearing of vegetation for agricultural production, forestry exploitation through removal of certain woody species for timber and poles, introduction of invasive alien species, fire, unsustainable harvesting of

other plant species for medicinal purposes, liberalisation of crop production and marketing. A general decline in plant and animals species has been observed in the country. For example, the population of roan antelopes and zebra in Vwaza wildlife reserves have dropped by 26% and 37%, respectively, between 2005 and 2008. (GoM, 2010).

In addition, genetic diversity is threatened with genetic erosion caused by the introduction of modern crop varieties and animal breeds that have been replacing the traditional crop varieties and livestock breeds. Genetic erosion is more pronounced in agro-biodiversity.

The Government is implementing a number of programs to safeguard the status of ecosystems, species and genetic diversity. These include, among others, the establishment of the Malawi Plant Genetic Resources Centre (MPGRC), which is responsible for the collection, documentation and preservation of plant genetic resources. This strategic objective aims to strengthen management of ecosystems, species and genetic diversity.

Target 12: By 2025, the extinction of known threatened species is prevented and their conservation status is improved and sustained

There has been a major decline in some species and reported cases of extinction. The rhino is the well known case of complete extinction in Malawi, but measures have been taken to reintroduce it in some of Malawi's national parks. The following actions will assist Malawi to minimize extinction incidences and improve the status of known threatened species.

Actions

a) Update the National Red Data List;
b) Increase connectivity between protected areas and wildlife home ranges both locally and internationally;
c) Reintroduce species that have been locally extinct;
d) Develop and implement strategies to manage threatened and endemic species;
e) Conduct robust species monitoring using methods that account for both common and threatened species;
f) Identify and characterize biodiversity hotspots;
g) Ensure that current protected areas with special designations (biosphere reserves, Ramsar sites, world heritage sites) actively seek and are able to access funds through these designations;
h) Develop a National Action Plan for implementation of POWPA.

Output Indicators

a) Red data list for Malawi updated;
b) Number of wildlife corridors created;
c) Number of species reintroduced;
d) Number of strategies on endangered species developed and implemented;
e) Number of biodiversity hotspots identified;
f) National Action Plan for implementation of POWPA developed.

Responsible Institutions: Ministry responsible for Natural Resources, Energy and Mining; Malawi Plant Genetic Resources Centre; Ministry responsible for Agriculture, Irrigation and Water Development; Ministry responsible for Information, Tourism and Culture; NHBGM; Ministry responsible for Trade and Industry; Malawi Revenue Authority; Private Sector; CSOs; and Local Communities.

Target 13: By 2025, the genetic diversity of wild and domesticated plants and animals is maintained and safeguarded

Agro-biodiversity contributes to food security and increased employment opportunities, hence improved living standards. Implementing the following actions will enhance agro-biodiversity conservation in

Malawi.

Actions

a) Document community practices and traditional knowledge on agro-biodiversity management;
b) Develop guidelines for collection, characterization and conservation of germplasm;
c) Conduct capacity-building initiatives on collection, characterization and conservation of species;
d) Procure equipment for collection characterization and conservation of species;
e) Update land use maps and management plans for biodiversity conservation sites;
f) Conduct research on genetic variation of domesticated wild plants;
g) Develop mechanisms to harmonize activities of organizations dealing with agro-biodiversity conservation (genetic material conservation);
h) Promote cultivation of indigenous plant species such as fruits and vegetables to enhance their preservation;
i) Maintain and promote local land races by establishing local community and provincial gene banks;
j) Promote farmers rights and collaborate on prioritization;
k) Collect representatives of common flora and fauna currently not available in the Herbarium and Museums' Natural History collections;
l) Conduct targeted conservation research in biodiversity hotspots.

Output Indicators

a) Number of indigenous species cultivated and protected;
b) Number of in-situ conservation sites of wild relatives of cultivated plants established and protected;
c) Number of land races kept in gene banks and botanic gardens;
d) Number of species collected and kept in herbarium and natural history collection;
e) Number of collections with nutritive potential established;
f) Number of programmes aimed at promoting farmer's rights;
g) Number of surveys to document traditional knowledge used for agro-biodiversity conservation conducted;
h) Guidelines for collection, characterization and conservation of germ-plasm developed;
i) Number of capacity-building initiatives on collection, characterization and conservation of species;
j) Number of pieces of equipment procured for collection, characterization and conservation of species;
k) Number of land use maps and management plans updated;
l) Number of research studies on genetic variation of domesticated wild plants conducted;
m) Mechanisms to harmonize activities of organisations dealing with agro-biodiversity conservation developed;
n) Number of targeted conservation research conducted.

Responsible Institutions: Ministry responsible for Natural Resources, Energy and Mining; Ministry responsible for Agriculture, Irrigation and Water Development; NHBGM; Academia; NGOs; Ministry responsible for Justice and Constitutional Affairs; Ministry responsible for Local Government and Rural Development; Malawi Plant Genetic Resource Centre; CSOs; and Local Communities.

Target 14: By 2025, the level of protection on safe handling, transfer and use of living modified organisms resulting from modern biotechnology that may have adverse impacts on biodiversity is strengthened, taking into account risks to human health

Malawi has made significant progress in biotechnology research and development. Currently Malawi is conducting trials for

insect-resistant cotton and herbicide-tolerant cotton that, when successful, will help smallholder farmers to minimize losses in their cotton harvests that currently arise from infestation of pests and diseases. However, knowledge on biodiversity is relatively low. This target will aim to ensure that the levels of protection on safe handling, transfer and use of living modified organisms is strengthened to ensure that there are no adverse impacts on biodiversity and human health.

Actions

a) Revise the Biosafety Act and regulations;
b) Conduct public awareness campaigns on biosafety legislation;
c) Develop and implement a National Biosafety Capacity Building Plan;
d) Establish national systems for documentation, management and information sharing on biosafety;
e) Establish an effective detection and monitoring system for biotechnology.

Output Indicators

a) Biosafety Act and regulations revised;
b) Public awareness campaigns on biosafety legislation conducted;
c) A national biosafety capacity-building plan developed and implemented;
d) A biosafety clearing house mechanism developed and operationalised;
e) An effective monitoring system for biotechnology established.

Responsible Institutions: Ministry responsible for Natural Resources Energy and Mining; Ministry responsible for Health; National Commission for Science and Technology; Ministry responsible for Industry and Trade; Ministry responsible for Agriculture, Irrigation and Water Development.

2.5.5 Strategic Objective Five: Enhance the Benefits to All from Biodiversity and Ecosystem Services

Ecosystems provide goods and services that are particularly important for human well-being. The condition and functioning of ecosystems determines their ability to supply ecosystem services for people. However, Malawi has not fully benefited from utilisation of ecosystem goods and services because of inadequate policy and legislative framework. This includes a need to focus on supplying important ecosystem services as part of the management of natural areas. Also, access to genetic resources by entrepreneurs has not benefitted the people of Malawi. In 2010, the international community adopted the Nagoya Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilisation, to which Malawi is a party to. This strategic objective will ensure that benefits arising from utilisation of biodiversity are enhanced.

Target 15: By 2025, the supply of important ecosystem services is safeguarded and restored, taking into account gender roles and responsibilities of the youth, the poor and the vulnerable

This target will assist Malawi to enhance the participation of vulnerable groups, the youth, and women in biodiversity management. Further implementing this target will ensure that these groups benefit fully from the ecosystem services that biodiversity provides in Malawi.

Actions

a) Develop policy and legislative frameworks on biodiversity management that take into account the needs of vulnerable groups and gender roles;
b) Develop and implement collaborative management programs for the terrestrial and aquatic ecosystems with the participation of vulnerable groups, including women;
c) Conduct awareness-raising campaigns in the fringes of protected ecosystems on biodiversity management from a poverty

and gender perspective;
d) Develop programs to support alternative income-generating activities that can take away pressure from the ecosystems, support livelihoods and address gender issues (e.g. bee keeping; energy efficient stoves)

Output Indicators

a) Biodiversity policy and legislation frameworks developed;
b) Number of collaborative management programs developed and implemented;
c) Number of awareness programs on biodiversity management;
d) Number of income-generating programs developed.

Responsible Institutions: Ministry responsible for Natural Resources, Energy and Mining; NHBGM; Ministry responsible for Agriculture and Food Security; Ministry responsible Local Government and Rural Development; Ministry responsible for Gender and Disability; NGOs; CSOs; Academia; and Local Communities.

Target 16: By 2025, access to genetic resources and traditional knowledge is regulated and benefits arising from utilization of the resources and associated traditional knowledge are shared in a fair and equitable manner

Malawi is committed to implementing measures to promote access and benefit sharing in the utilization of its genetic resources, since its ratification to the Nagoya Protocol on Access and Benefit Sharing in 2014. This target responds to the need to develop a comprehensive policy and legislative approach on access and benefit sharing and establishing administrative arrangements for the effective implementation of the protocol.

Actions

a) Develop legislation on Access and Benefit Sharing (ABS) and Intellectual Property Rights (IPR);
b) Conduct sensitisation on the ABS and IPR legislation at all levels;
c) Develop a valorization strategy for Malawi;
d) Strengthen capacity of institutions and local communities to effectively participate in negotiations, regulation and monitoring compliance of genetic resources (GR) and traditional knowledge (TK) users;
e) Establish an effective system for monitoring and tracking compliance to ABS legislation;
f) Establish institutional and administrative structures to facilitate implementation of the Nagoya Protocol in Malawi;
g) Establish an effective mechanism for documentation, management and sharing of information related to ABS and ensure effective participation in the Access and Benefit Sharing Clearing House (ABS-CH).

Output Indicators

a) Regulations on ABS and IPR developed and operationalised;
b) Number of sensitisation and awareness campaigns on the ABS and IPR legislation;
c) A valorization strategy for biodiversity in Malawi developed;
d) Number of capacity-building initiatives and trainings in negotiation, regulation and monitoring compliance of GR and TK users conducted;
e) A system for monitoring and tracking compliance to ABS legislation developed and operationalised;
f) Institutional and administrative structures for implementation of the Nagoya Protocol established;
g) A national mechanism for documentation, management and sharing of information related to ABS developed.

Responsible Institutions: Ministry responsible for Natural Resources, Energy and Mining; NHBGM; Ministry responsible for Agriculture, Irrigation and Water Development; Ministry responsible for Local Government and Rural Development; Ministry responsible for Gender and Disability; Ministry responsible for Information, Tourism and Culture; Ministry

responsible for Trade and Industry; Ministry responsible for Justice and Constitutional Affairs; NGOs; CSOs; Academia; and Local Communities.

Chapter Three

Implementation Arrangements

Photo Credit: Wildlife Environmental Society of Malawi

This NBSAP II is a product of a consultative process involving all stakeholders in the management and utilization of biodiversity in Malawi. Effective and efficient implementation of the strategy and action plan requires effective institutional arrangements and mechanisms to facilitate active participation of stakeholders. Therefore, it is important to continually evaluate the performance and capacity of key institutions as well as institutional arrangements to ensure attainment of the objectives and targets set in the NBSAP II.

3.1 IMPLEMENTATION OF NBSAP

Implementation of this strategy shall fall within the existing institutional arrangements at central and local government levels in which relevant statutory corporation, civil society, trusts and non-governmental organizations participate. Some of the institutions are as follows:

a) Ministry responsible for Natural Resources, Energy and Mining;
b) Ministry responsible for Information, Tourism and Culture;
c) Ministry responsible for Agriculture Irrigation and Water Development;
d) Ministry responsible for Finance, Economic Planning and Development;
e) National Commission for Science and Technology;
f) Ministry responsible for Local Government and Rural Development;
g) National Herbarium and Botanic Gardens of Malawi;
h) Non-governmental organizations and Civil Society;
i) Academia, e.g. Universities of Malawi, Mzuzu and LUANAR;
j) Malawi Revenue Authority; and
k) Ministry of Trade and Industry.

3.2 INSTITUTIONAL ARRANGEMENT

Malawi has in place an institutional arrangement aimed at creating an enabling environment for implementation of biodiversity programs as discussed in Chapter 1. The current arrangement includes the central and local government levels in which relevant statutory corporation and non-governmental organizations participate. The organizations are linked through committees and focal points at various levels. Implementation of the NBSAP II will follow the existing institutional arrangement.

3.2.1 Coordinating Agency

Ministry of Natural Resources, Energy and Mining, through Environmental Affairs Department (EAD), shall coordinate the overall implementation of the strategy. Its coordination mandate will enable it to balance concerns of both interested and affected parties under the CBD and other related conventions. The Environmental Affairs Department serves as a secretariat for implementation of biodiversity activities in Malawi.

The EAD will be responsible for;

- Facilitating harmonization of national environmental policies and legislation;
- Enforcing of legislation, capacity building, setting of standards and compliance monitoring;
- Identifying fragile ecosystems, biodiversity hotspots and threatened species that need protection and, where required, ensuring fulfilment of Malawi's obligations to the Convention on Biological Diversity and other related international agreements;
- Mobilizing financial resources for the implementation of biodiversity targets as set in the NBSAP II; and
- Promoting participation of local communities, NGOs and CBOs in biodiversity conservation.

3.2.2 Sectoral Agencies

Sectoral agencies will be responsible for

ensuring the implementation of the relevant strategies and actions. Specifically they will be responsible for:

a) Mainstreaming biodiversity considerations into their sectoral policies and plans;
b) Addressing sector specific issues prioritized in the NBSAP II;
c) Enforcing of legislation, capacity building, setting of standards and compliance monitoring;
d) Providing relevant guidance and support at national, district and local levels on biodiversity management;
e) Collecting and disseminating information on activities affecting biodiversity; and
f) Collaborating with the Environmental Affairs Department on relevant issues in NBSAP II.

3.2.3 Local Councils

Environmental management, including biodiversity conservation, is a decentralized function. As such, the roles of the local councils will include:

a) Coordinating the implementation of the NBSAP II in the councils;
b) Mainstreaming biodiversity considerations in Local Environment Action Plans and subsequently incorporating them in District Development Plans (DDPs);
c) Formulating and enforcing local policies and by-laws related to biodiversity conservation and its sustainable use;
d) Promoting and documenting traditional knowledge, innovations and practices in biodiversity conservation;
e) Monitoring biodiversity conservation programmes, including gathering, maintaining and disseminating accurate information;
f) Local communities will be responsible for implementation of the NBSAP.

3.2.4 Civil Society, Non-Governmental Organisations and Private Sector

Civil society, NGOs and private sector will be instrumental in the implementation of this strategy. Their functions, among others, will include:

a) Carrying out advocacy and awareness on biodiversity management;
b) Strengthening the capacity of community-based organisations and communities to implement biodiversity conservation programmes;
c) Promoting networking opportunities, especially among NGOs and other civil society organizations;
d) Assisting in promoting and documenting traditional knowledge, innovations and practices in biodiversity conservation;
e) Promoting and documenting traditional knowledge, innovations and practices in biodiversity conservation;
f) Assisting CBOs and communities to formulate and implement projects related to the NBSAP II, the convention and protocols; and
g) Contributing human and financial resources to support biodiversity conservation programmes.

3.2.5 Academia and Research Institutions

Academic institutions in Malawi play a vital role in capacity building, including research. Some of the key academic institutions include: University of Malawi, Lilongwe University of Agriculture and Natural Resources, Natural Resources College, Malawi College of Forestry and Wildlife and Mzuzu University. Their functions, among others, will include:

- Capacity building in biodiversity management;
- Collaborating with sectors on research and monitoring;
- Mobilizing financial resources for the implementation of biodiversity targets as set in the NBSAP II;
- Building specifically designed infrastructure and equipment for biodiversity management;

- Undertaking biodiversity research and increasing dissemination of knowledge on biodiversity.

3.2.6 Coordination Committees

The coordination and functioning of implementing organizations is linked through committees and designated focal points at various levels. Several decentralized structures have been established in the country to guide and support policy, legislation and programmes formulation as well as implementation of environment and natural resources management activities.

- The Cabinet Committee on Natural Resources and Environment (CCNRE) is the highest-level policy and decision-making body responsible for environmental policy issues. It informs the cabinet on the state of the environment and political guidance and support.
- The Parliamentary Committee on Agriculture and Natural Resources (PCANR) lobbies Parliament on all environmental matters.
- The National Biodiversity Steering Committee (NBSC) provides guidance to various sectors, institutions and organizations involved in biodiversity conservation and management.
- The National Council on Environment (NCE) advises both the CCNRE and PCANR. As a policy advisory institution, the NCE operates through working groups and national steering committees. The NCE provides policy direction and monitors the implementation of biodiversity programmes
- The Technical Committee on the Environment (TCE), which advises the NCE, examines scientific issues and makes recommendations for action.

3.3 COMMUNICATION, EDUCATION AND PUBLIC AWARENESS OF THE NBSAP

NBSAP II recognizes that effective communication is vital for biodiversity conservation. Planning for conservation requires communication to gain the commitment and cooperation of people who use, have an impact on, or conserve biodiversity. Effective communication requires better analysis of the issues and the required remedies, better understanding of the target groups, a clear understanding of communication objectives, identification of appropriate means and media for consultative processes and communication products.

This CEPA provides a framework for delivering key messages and proposes actions to raise awareness on biodiversity to specific target audiences. It is expected that this plan will inform, educate and raise public awareness and support for the implementation of the NBSAP II and other biodiversity-related issues. This will be achieved through the following specific objectives:

i. Raise awareness of the NBSAP II to mobilize support for its implementation among various target groups;
ii. Improve public understanding of the value of conserving biodiversity;
iii. Promote public participation in the implementation of NBSAP II;
iv. Enhance institutional and individual capacity for communication on biodiversity issues;
v. Enhance accountability in implementation, monitoring and evaluation of NBSAP II.

3.3.1 Approaches and Audience

This strategy seeks to successfully communicate key messages on the implementation of the NBSAP II and other biodiversity-related management activities to many different targeted groups, including government agencies, NGOs, the private sector, development partners and the general public. The CBD focal point will coordinate the implementation of this strategy and will identify and work with key partners to create a

society that is well informed about the NBSAP II and its implementation.

3.3.2 Media of Communication

A key part of successful promotion requires the use of the most effective channels of communication to reach the target audience. Key messages will be delivered through;

- Websites (nccp.mw.org; www.chmmw.org);
- Regular newsletters;
- Workshops/meetings;
- Bulletins and publications;
- Radio and television programmes;
- Other social media.

These channels of communications have been used inter-changeably in the past, depending on the type of message and the target audience. Resources will be mobilized to implement this strategy.

3.3.3 Key Messages

This strategy will provide a framework for appropriately communicating with stakeholders and target audiences regarding the implementation of the plans. Key messages will be relayed to the target audiences. The messages will include the following:

i. Values of biodiversity to the economy and human well-being;
ii. Sustainable use of biodiversity and strategies for its conservation;
iii. Information on major biodiversity concerns of Malawi as identified in the NBSAP II: habitat loss and fragmentation, overexploitation, increased incidences of invasive species, pollution and climate change.

The Table 4 on the following page indicates the categories of stakeholders and the tools that will be used in communicating key biodiversity messages. A range of different options is given for suitable approaches for communicating with specific audiences.

3.4 FINANCING THE IMPLEMENTATION OF THE NBSAP II

The implementation of the strategy will take a programme-based approach with participation of various stakeholders. However, the Government does not have adequate resources to implement all the programs within the strategy. Therefore, it is expected that development partners, civil society, NGOs and private sector will support implementation of programs financially and technically.

3.5 MONITORING, EVALUATION AND REPORTING

This strategy will be implemented over a period of 10 years with a mid-term review after 5 years. The strategy will require regular monitoring and evaluation. The Ministry of Natural Resources, Energy and Mining shall be the lead agency responsible for monitoring implementation of the strategy. For effective monitoring and evaluation of programmes under the strategy, a comprehensive Monitoring and Evaluation framework has been developed and placed in Annexe 4. This will form a basis for periodic reviews to establish progress made. To effectively monitor the implementation of activities under this strategy, the Ministry of Natural Resources, Energy and Mining will coordinate preparation of annual work plans and reports based on performance and impact indicators. These reports will feed into quarterly technical working group and sector working group reviews. The reports will include the following:

- Annual reports from relevant sectors, NGOs, Private Sector, etc.;
- Annual reports from Ministry of Natural Resources, Energy and Mining;
- Periodic national reports to the CBD.

Table 4: Categories of Stakeholders and Tools for Communication

Target Audience	Objective/Messages	Communication Material
Policy Makers	• To influence changes in policy and legislation. • Values of biodiversity and the need to mainstream biodiversity in development planning and allocate financial and human resources to biodiversity concerns.	Meetings/workshops, media, brochures, policy briefs
Local Communities	• To inform and build awareness of the need to conserve biodiversity and encourage their participation in biodiversity conservation.	Meetings, workshops, media, films/documentaries, drama, pamphlets
General Public	• Information on the values of biodiversity and how they contribute to human development and survival. Suggestions on how communities, schools and individuals can protect, conserve and sustainably use biodiversity.	Radio and television materials, video documentaries
Schools and Other Learning Institutions	• Information on how schools and youths can participate in biodiversity conservation.	Bookmarks, posters, newsletters, fact sheets, internet, research publications, targeted meetings. School activities - presentations, exhibitions, career day competitions - essay, art, quizzes, public exhibitions
Business and Their Associations	• Businesses depend on biodiversity for their raw materials and should therefore get involved in protecting and conserving biodiversity to ensure sustained supplies. Businesses should support the NBSAP II through their Corporate Social Responsibility.	Internet, trade fairs, newsletters, brochures and promotional material, meetings, compiled information and policy material
Research Institutions	• To receive updated information on the status and threats posed to biodiversity. • To solicit assistance and build capacity in biodiversity conservation	Targeted meetings, workshops, internet, fact sheets, briefs, radio, research publications, reports, brochures, seminars
NGOs and Other Private Sector	• To inform and build awareness of the need to conserve biodiversity and encourage their participation in biodiversity conservation	Targeted meetings, workshops, internet, fact sheets, briefs, radio, research publications, brochures, seminars, project reports
Regional and International Institutions	• To solicit assistance and build capacity in undertaking activities in biodiversity conservation. • To build partnership/networks to collaborate on projects in biodiversity conservation.	Consultation, meetings, email, internet, international seminars
Media	• To provide information for public dissemination. • To obtain support for publicizing issues on biodiversity vulnerability. • To report on work done in biodiversity conservation	Press releases, media tours/visits, website, internet/email, media events and relations, media briefings, coverage in magazines, producing press releases

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ANNEXE 1: LIST OF STAKEHOLDERS CONSULTED

Government Ministries and Department	
Alban Pulaizi Orton Kachinjika Moffat Manase	Department of Fisheries
John Mussa	Department of Land Resources Conservation
Sipho Billiat William Simwanza	Ministry of Finance and Economic Development
Khombe A.	Department of Culture
Bernard Chimera	Department of Livestock and Animal Health
Christopher Salema Dr. Tiwonge Gawa	Museums of Malawi
Dr. Zachariah Magombo Dr. Montfort Mwanyambo Dr. Mwafongo Jameson Kamwendo	National Herbarium and Botanical Gardens of Malawi
Jester Kaunga Nyirenda Mary Chilimampunga	Department of Parks and Wildlife
Titus Zulu Stella Gama	Forestry Department
Nolipher Mponya	Malawi Plant Genetic Resources Centre
Tawonga Mbale Shamiso Najira Mpeta K. M. Mwanyongo Michael Makonombera Bennon Yassin Victoria Kachimera	Environmental Affairs Department
Research and Higher Learning Institutions	
Dr. Chimwemwe Mhango	University of Malawi - Chancellor College
Edwin Chiwona James Kazembe Wilson Jere	Lilongwe University for Agriculture and Natural Resources
Dr. T Chinyenga Gerald Meke	Forestry Research Institute of Malawi
Leonard Manda	Mzuzu University
Ishmael Kosamu	University of Malawi – The Polytechinc
Civil Society	
Bright Phiri Agatha Chimsewa William Chanza	Centre for Environmental Policy and Advocacy
Gelvaz Thamala	Wildlife Environmental Society of Malawi
Khumbo Kamanga Reginald Mumba Clifford Mwale Chris Mwambene	Coordination Union for the Rehabilitation of the Environment

Parastatals and Private Sector	
Chris Dhose	Tree Crops Limited
David Nangoma	Mulanje Mountain Conservation Trust
Jonathan Vaughan	Lilongwe Wildlife Centre
Karen Price	Malawi Environment Endowment Trust
Dr G.Y Mkamanga	Biodiversity Conservation Initiative
Samuel Kamoto	African Parks - Majete Wildlife Reserve
Mshawa Tembo Yohane Chimbalanga Lyson Kampira	National Commission for Science and Technology
International Organisations	
David Chalmers Madalitso Kaferawanthu	USAID
Michael Mmangisa	UNDP - Poverty Environment Initiative
George Phiri	Food and Agriculture organisation
Joseph Nagoli	WorldFish Centre
Local Communities and the Youth	
Chiza Duncan Mkandawire	Nyika Vwaza Association
Gloria Masula	National Forum for Youth Development
James Sadalaki	Nkhotakota Wildlife Reserve Association

ANNEXE 2: IMPLEMENTATION PLAN FOR THE NBSAP II

National Targets	Relevant Aichi Biodiversity Target	Actions	Timeframe (2015-2025) 1	2	3	4	5	6	7	8	9	10	Responsible Institutions	Est. Cost (USD '000)	Possible Funding Source
STRATEGIC OBJECTIVE 1: Improve Capacity and Knowledge on Biodiversity Issues															
Target 1: By 2025, human and institutional capacity for science and technology related to biodiversity is improved.	Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends and the consequences of its loss are improved, widely shared and transferred and applied	a) Establish a National Biodiversity Information Facility;	■	■	■	■	■	■	■	■	■	■	MoNREM, NCST, MoAIWD, Ministry of Tourism and Culture, Museums of Malawi, NHBGM, FRIM, NGOs, CSOs, Academia	5,000	Multilateral Bilaterals like World Bank, African Development Bank, Norwergian Embassy FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
		b) Update an inventory of institutions that are involved in biodiversity research and management;	■												
		c) Assess knowledge gaps and identify priority research areas;	■												
		d) Enhance institutional capacity to manage and monitor implementation of biodiversity programmes;		■	■	■	■	■							
		e) Increase the number of programs on biodiversity research;		■	■										
		f) Strengthen the capacity of training institutions on biodiversity research and dissemination;	■	■	■	■	■	■	■	■	■	■			
		g) Strengthen human capacity to manage biodiversity.	■	■	■	■	■	■	■	■	■	■			
Target 2: By 2025, traditional knowledge, innovations and practices of	Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the	a) Update an inventory of traditional knowledge systems, innovations and practices in Malawi;	■										MoNREM, Ministry of Tourism and Culture, MoLGRD, NHBGM,	3,000	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA,

local communities are respected and harnessed in line with national and international legislation	conservation and sustainable use of biodiversity and their customary use of biological resources are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention, with the full and effective participation of indigenous and local communities, at all relevant levels	b) Conduct awareness campaigns among communities, researchers and NGOs to raise the profile on the value of traditional knowledge;	■	■	■	■	■	■	■	■	■	■	FRIM, NCST, MoAIWD, Museums of Malawi, Academia, Ministry of Justice, Traditional Institutions, Local Communities, NGOs, CSOs		ODA, GIZ, GoM and the private sector
		c) Facilitate development of community protocols on traditional knowledge, practices and innovations;	■	■	■										
		d) Promote and upscale best traditional management systems.	■	■	■	■									
Target 3: By 2025, At least 50% of the Malawi population is aware of the values of biodiversity to ensure its conservation and sustainable use	Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably	a) Develop a communication, education and public awareness strategy for biodiversity;	■	■									MoNREM, Ministry of Information, Tourism and Culture, Media, MoF, MoEP&D, Ministry of Education, Science and Technology, NHBGM, Private Sector, NGOs, MoLGRD, Academia	2,000	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
		b) Integrate biodiversity issues into primary and secondary school curricula;	■	■	■	■									
		c) Conduct awareness campaigns on the importance of biodiversity;			■	■	■	■	■	■	■	■			
		d) Promote active participation of local communities in biodiversity conservation through various CBNRM institutions such DESCs, VNRMCs, ADC, BVCs and Wildlife Clubs.	■	■	■	■	■	■	■	■	■	■			

National Targets	Relevant Aichi Biodiversity Target	Actions	Timeframe (2015-2025) 1	2	3	4	5	6	7	8	9	10	Responsible Institutions	Est. Cost (USD '000)	Possible Funding Source
STRATEGIC OBJECTIVE 2: Mainstream Biodiversity into National, Sectoral and Local Development Plans															
Target 4: By 2025, biodiversity values are integrated into national, sectoral and local development policies and plans	Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems	a) Conduct integrated ecosystem assessments and economic analyses to evaluate the specific contribution of biodiversity to national economy and human well-being;	■	■	■	■							MoNREM, Ministry of Tourism, Culture, Parks and Wildlife, MoF, MoEP&D, NHBGM, NCST, MoAIWD, MoLGRD, NGOs, Private Sector, Academia, Local Communities	8,000	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
		b) Integrate biodiversity poverty linkages into the Malawi Growth and Development Strategy III;		■	■										
		c) Develop guidelines on how sectors and national planners can integrate biodiversity conservation into relevant policies and plans;		■	■	■									
		d) Identify and engage sectors to integrate biodiversity conservation;		■	■	■	■	■	■						
		e) Develop LBSAP's.	■	■	■	■	■	■	■	■					
Target 5: By 2025, sustainable financing mechanisms for effective	Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for	a) Develop and implement a Biodiversity Resource Mobilization Strategy	■	■									MoNREM, MoF, MoEP&D, MoLGRD, Ministry of Trade and	1,500	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA,

implementation of biodiversity programs developed	Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels	b) Promote and implement innovative financing mechanisms such as Access and Benefit Sharing and Public-Private Partnership programs										Industry, NGOs, Academia, Malawi Revenue Authority, Private Sector		ODA, GIZ, GoM and the private sector
		c) Develop and implement initiatives on PES												
STRATEGIC OBJECTIVE 3: Reduce Direct Pressures on Biodiversity														
Target 6: By 2025 at least 50% of the degraded terrestrial habitats are restored and protected	Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced	a) Identify degraded habitats;										MoNREM, MoAIWD, NHBGM, Ministry of Information, Tourism and Culture, FRIM, NGOs, CSOs, Academia, Local Communities	2,000	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
		b) Identify habitats with high species diversity;												
		c) Develop, review and implement strategies and programmes for restoring habitats;												
		d) Develop and implement programmes to protect habitats of high species diversity.												
Target 7: By 2025, aquatic biodiversity is managed and harvested sustainably within safe ecological limits	Target 6: By 2020. all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and	a) Develop guidelines to promote integrated watershed management;										MoNREM, MoAIWD, Ministry of Information, Tourism and Culture, DoF, Academia, Private Sector, NGOs, CSOs, Local Communities	2,000	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
		b) Develop programmes on integrated watershed management;												
		c) Promote use of legal fishing gear;												
		d) Develop a national wetlands policy;												
		e) Identify, rehabilitate and protect fish spawning areas for important species;												

National Targets	Relevant Aichi Biodiversity Target	Actions	Timeframe (2015-2025) 1 2 3 4 5 6 7 8 9 10	Responsible Institutions	Est. Cost (USD '000)	Possible Funding Source
STRATEGIC OBJECTIVE 3: Reduce Direct Pressures on Biodiversity						
	ecosystems are within safe ecological limits	f) Undertake ex-situ and conservation of threatened or endangered aquatic biodiversity species;				
		g) Review and implement strategies and plans for management of endemic fish species;				
		h) Reduce fishing effort in shallow waters to sustainable levels by promoting deep-water fishing.				
Target 8: By 2025, area under forest cover is increased by 4% and managed sustainably, ensuring conservation of biodiversity	Target 7: By 2020, areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity	a) Review and implement effective reforestation programmes that ensure survival and diversity of planted trees;		MoNREM, MoAIWD, NHBGM; Ministry of Information, Tourism and Culture, FRIM, Private Sector, NGOs, CSOs	5,000	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
		b) Develop and implement community-based programmes on conservation and sustainable use of forest biodiversity;				
		c) Promote improved forest management techniques;				
		d) Promote the use of alternative sources of energy.				

Target 9: By 2025, invasive alien species and their pathways are identified and prioritized for control and prevention from movement and spreading in and out of the country	Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment	a) Compile documentation and maps on IAS in Malawi, including an inventory of IAS prevalent in the country;	MoNREM, MoAID, FRIM, NHBGM, Academia, Ministry of Trade and Industries, Malawi Revenue Authority, NCST, CSOs, Local Communities	6,500	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
		b) Develop a national IAS management plan;			
		c) Conduct awareness campaigns and build capacity of different stakeholders on how to identify, track and prevent IAS in their localities and on the threat of IAS to biodiversity;			
		d) Procure and upgrade inspection infrastructure for tracking and identifying IAS in Malawi;			
		e) Conduct capacity-building initiatives on IAS monitoring;			
		f) Monitor the entry and spread of IAS;			
		g) Regulate and control movement an spreading of IAS.			

National Targets	Relevant Aichi Biodiversity Target	Actions	Timeframe (2015-2025) 1	2	3	4	5	6	7	8	9	10	Responsible Institutions	Est. Cost (USD '000)	Possible Funding Source
STRATEGIC OBJECTIVE 3: Reduce Direct Pressures on Biodiversity															
Target 10: By 2025, pollution is reduced to minimize ecosystem degradation and biodiversity loss	Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity	a) Procure equipment for monitoring environmental pollution;	■	■	■								MoNREM, FRIM, MoAIWD, NHBGM, Academia, Ministry of Trade and Industries, Malawi Revenue Authority, Malawi Bureau of Standards, CSOs, City Assemblies, Local Councils	14,000	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
		b) Conduct capacity-building initiatives on monitoring of environmental pollution;	■	■	■	■	■	■	■	■					
		c) Develop and implement polluter pays principle regulations;	■	■	■	■	■	■	■	■	■	■			
		d) Develop programs to promote the reduction, reuse and recycling of wastes;	■	■	■										
		e) Promote public-private partnerships on waste management;	■	■	■	■	■	■	■	■	■	■			
		f) Strengthen enforcement of policy and regulatory frameworks for pollution control.	■	■	■	■	■	■	■	■	■	■			
Target 11: By 2025, anthropogenic pressures on vulnerable ecosystems are minimized, thereby improving ecosystems resilience to climate change	Target 10: By 2015, the multiple anthropogenic pressures on coral reefs and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning	a) Promote alternative energy sources to fuel wood and charcoal;	■	■	■	■	■	■	■	■	■	■	MoNREM, MoAIWD, Ministry of Information, Tourism and Culture, NHBGM, Private Sector, NGOs, CSOs, Academia	5,000	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
		b) Promote sustainable livelihood programs such as bee keeping and mushroom production;	■	■	■	■	■	■	■	■	■	■			
		c) Identify and promote REDD+ programs;	■	■	■	■	■	■	■	■					
		d) Promote afforestation programmes;	■	■	■	■	■	■	■	■	■	■			

		e) Promote initiatives on payment of ecosystem services;													
		f) Promote enforcement of legislation.													
STRATEGIC OBJECTIVE 4: Improve the Status of Biodiversity															
Target 12: By 2025, the extinction of known threatened species is prevented and their conservation status is improved and sustained	Target 12: By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained	a) Update the National Red Data List;											MoNREM, Malawi Plant Genetic Resources Centre, MoAIWD, Ministry of Information, Tourism and Culture, NHBGM; Ministry of Trade and Industry, Malawi Revenue Authority, Private Sector, CSOs, Local Communities	20,000	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
		b) Increase connectivity between protected areas and wildlife home ranges both locally and internationally;													
		c) Introduce species that have been locally extinct;													
		d) Develop and implement strategies to manage threatened and endemic species;													
		e) Conduct robust species monitoring using methods that account for both common and threatened species;													
		f) Identify and characterize biodiversity hotspots;													
		g) Ensure that current protected areas with special designations actively seek and are able to access funds available through these designations;													
		h) Develop a national plan for implementation of PoWPA.													

National Targets	Relevant Aichi Biodiversity Target	Actions	Timeframe (2015-2025) 1	2	3	4	5	6	7	8	9	10	Responsible Institutions	Est. Cost (USD '000)	Possible Funding Source
STRATEGIC OBJECTIVE 4: Improve the Status of Biodiversity															
Target 13: By 2025, the genetic diversity of wild domesticated plants, and animals is maintained and safeguarded	Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity	a) Document community practices and tradition knowledge on agro-biodiversity management;											MoNREM, MoAIWD, NHBGM, Academia, NGOs, Ministry of Justice and Constitutional Affairs, MoLGRD, Malawi Plant Genetic Resource Centre, CSOs, Local Communities	18,000	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
		b) Develop guidelines for collection, characterization and conservation of germplasm;													
		c) Conduct capacity-building initiatives on collection, characterization and conservation of species;													
		d) Procure equipment for collection characterization and conservation of species;													
		e) Update land use maps and management plans for biodiversity conservation sites;													
		f) Conduct research on genetic variation of domesticated wild plants;													

g) Develop mechanisms to harmonize activities of organizations dealing with agro-biodiversity conservation;	h) Promote cultivation of indigenous plant species such as fruits and vegetables to enhance their preservation;	i) Maintain and promote local land races by establishing local community and provincial gene banks;	j) Promote farmers rights and collaborate in prioritization;	k) Collect representatives of common flora and fauna currently not available in the Herbarium and Museums' Natural History collections;	l) Conduct targeted conservation research in biodiversity hotspots.

National Targets	Relevant Aichi Biodiversity Target	Actions	Timeframe (2015-2025) 1	2	3	4	5	6	7	8	9	10	Responsible Institutions	Est. Cost (USD '000)	Possible Funding Source
STRATEGIC OBJECTIVE 4: Improve the Status of Biodiversity															
Target 14: By 2025, the level of protection on safe handling, transfer and use of living modified organisms resulting from modern biotechnology that may have adverse impacts on biodiversity is strengthened, taking onto account risks to human health	Target 3: By 2020, at the latest, incentives, including subsidies harmful to biodiversity are eliminated, phased out, or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions	a) Revise the Biosafety Act and regulations;											MoNREM, Ministry of Health, NCST, Ministry of Industry and Trade, MoAIWD	10,000	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
		b) Conduct public awareness campaigns on biosafety legislation;													
		c) Develop and implement a national Biosafety Capacity Building Plan;													
		d) Establish national systems for documentation, management and information sharing on biosafety;													
		e) Establish an effective detection and monitoring system for biotechnology.													
STRATEGIC OBJECTIVE 5: Enhance the Benefits to All from Biodiversity and Ecosystem Services															
Target 15: By 2025, the supply of important ecosystems services is safeguarded and restored, taking into	Target 14: By 2020, ecosystems that provide essential services, including services related to water and contribute to health, livelihoods and well-being, are restored and safeguarded,	a) Develop policy and legislative frameworks on biodiversity management that take into account the needs of the vulnerable and gender roles;											MoNREM, NHBGM, MoAIWD, MoLGRD, Ministry of Gender and Disability, NGOs, CSOs, Academia,	10,000	UNEP, UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector

account gender roles and responsibilities of the poor and the vulnerable	taking into account the needs of women, indigenous and local communities and the poor and vulnerable	b) Develop and implement collaborative management programs for the terrestrial and aquatic ecosystems with the participation of vulnerable groups, including women.											Local Communities		
		c) Conduct awareness-raising campaigns in the fringes of protected ecosystems on biodiversity management from a poverty and gender perspective;													
		d) Develop programs to support alternative income-generating activities that can take away pressure from the ecosystems, support livelihoods and address gender issues.													
Target 16: By 2025, access to genetic resources and associated traditional knowledge is regulated and benefits arising from utilization of the resources and associated traditional knowledge are shared in a fair and equitable manner	Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation	a) Develop legislation on ABS and IPR;											MoNREM, NHBGM, MoAIWD, MoLGRD, Ministry of Gender and Disability, Ministry of Information, Tourism and Culture, Ministry of Trade and Industry, Ministry of Justice and Constitutional	5,000	UNEP ,UNDP, WB, Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
		b) Conduct sensitization on the ABS and IPR legislation at all levels;													
		c) Develop a valorization strategy for Malawi;													

National Targets	Relevant Aichi Biodiversity Target	Actions	Timeframe (2015-2025) 1	2	3	4	5	6	7	8	9	10	Responsible Institutions	Est. Cost (USD '000)	Possible Funding Source
STRATEGIC OBJECTIVE 5: Enhance the Benefits to All from Biodiversity and Ecosystem Services															
		d) Strengthen capacity of institutions and local communities to effectively participate in negotiations, regulation and monitoring compliance of genetic resources (GR) and traditional knowledge (TK) users;											Affairs, NGOs, CSOs, Academia, Local Communities		
		e) Establish an effective system for monitoring and tracking compliance to ABS legislation;													
		f) Establish institutional and administrative structures to facilitate implementation of the Nagoya Protocol in Malawi;													
		g) Establish an effective mechanism for documentation, management and sharing of information related to ABS and ensure effective participation in the ABS-CH.													

ANNEXE 3: CAPACITY BUILDING PLAN FOR IMPLEMENTATION OF THE NBSAP IN MALAWI

The capacity building plan responds to strategic objective 1 of this NBSAP that aims to improve capacity and knowledge on biodiversity issues. The capacity building plan has been developed to ensure that knowledge and skills for effective implementation of the NBSAP are enhanced, institutions and individuals are equipped and prepared to effectively implement the NBSAP and conserve biodiversity. This will be done through mobilization of resources to conduct training workshops, research and strengthening of infrastructure for biodiversity management. Capacity building will further be achieved through networking between specialized institutions to exchange information and enhance knowledge on biodiversity.

Key Area	Activity	Expected Output	Target	Timeframe	Budget (USD '000)	Responsible
Update an inventory of institutions involved in biodiversity research and management and identify their needs	Conduct surveys to identify training and infrastructure needs at an organizational and individual level	A database of institutions and experts involved in biodiversity research Capacity Needs Assessment Report	A database produced Report	Sept 2015 – Sept 2016	25	EAD
Assess knowledge gaps and identify priority research areas	Identify priority research areas	Priority research areas identified	5 research priority areas identified	Dec 2015 – Dec 2016	50	EAD, NSCT, Academic and Research Institutions
	Identify institutions that offer knowledge in the areas identified	Institutions offering specified knowledge in biodiversity identified and contacted	5 institutions identified and contacted	Dec 2015	20	EAD, NSCT, Academic and Research Institutions
	Identify individuals to undertake postgraduate studies or carry out research in the areas identified	Increase the number of programmes on biodiversity research and the amount of information available on biodiversity	10 Individuals identified to undertake research and studies	2015-2025	35	EAD, NSCT, Academic and Research Institutions
Promote awareness of biodiversity issues amongst different stakeholders in	Identify key stakeholder and develop mechanisms for communication, coordination and networking between stakeholders	Key stakeholders identified and mechanisms for communication, coordination and networking between stakeholders identified	30 stakeholders identified	Jan 2016	10	EAD

Key Area	Activity	Expected Output	Target	Timeframe	Budget (USD '000)	Responsible
Malawi	Conduct seminars and workshops for Government departments, NGOs and local governments on the NBSAP	Seminars and workshops on the NBSAP conducted	6 workshops on NBSAP conducted	June 2015 – Dec 2015	60	EAD
	Lobby policy makers to support implementation of the NBSAP.	MPs and Councilors lobbied	5 meetings conducted	Oct 2015 – March 2016	50	EAD
	Organize Round Table Dialogues with the private sector and other actors that utilize biodiversity to implement the NBSAP	Round tables organized	3 round tables organized	Nov 2015 – July 2021	80	EAD
	Press conferences, releases and policy briefs	Information on the NBSAP and its status of implementation made available to the general public	5 press releases and 4 policy briefs released	2015-2025	100	EAD
	Conduct awareness campaigns among communities, researchers and NGOs to raise the profile on the value of genetic resources and traditional knowledge	People aware of the value of traditional knowledge and genetic resources	10 awareness campaigns conducted	2015-2025	500	EAD
Training	Develop training materials for different stakeholders on biodiversity	Manuals developed for conducting training on biodiversity	3 manuals developed in 3 languages	September 2018	420	EAD, Ministry of Education, NGOs
	Conduct Training of Trainer on NBSAP implementation	Local government officers like EDO, DFO's trained	5 TOT conducted	2015-2018	150	EAD
	Conduct national training workshops on access and benefit sharing	People aware about the Nagoya Protocol and integrate it in their plans	3 workshops conducted	July 2015 – Dec 2015	90	EAD, NCST
	Conduct national training workshop on invasive alien species	People aware of IAS and implement mechanisms to control their spread	5 workshops conducted	Jan 2016 – June 2021	100	NHBG, EAD, Academia
	Conduct training of law enforcement officers on IAS	Law enforcement officers able to identify and control border crossing of IAS	10 trainings conducted	2015-2018	300	NHBG, EAD, Academia
	Identify, organize and train local communities directly important for implementing the NBSAP	Important groups of local communities identified and trained	5 trainings conducted	2015-2020	200	EAD, EDO's and Local Governments

Documentation of Biodiversity	Update an inventory of important genetic resources and traditional knowledge systems, innovations and practices in Malawi	Biodiversity and traditional knowledge inventory developed and documented	2 inventories compiled (1 on GR, 1 on TK)	2015-2019	200	EAD in consultation with CNAs
	Train national designated officers to manage systems for documentation, management and information sharing on CHM	National designated officers identified and trained to manage systems for documentation, management and information sharing on CHM	3 trainings conducted	2015-2019	100	EAD
	Effectively operationalize the CHM and populate it with national biodiversity information	CHM operationalized and frequently updated	Quarterly update of CHM	2015-2025	100	EAD
	Conduct training, workshops, seminars, conferences on biodiversity data management, communication and publishing skills	Biodiversity officers trained on information dissemination skills	2 trainings conducted	April 2016-July 2018	150	EAD
	Develop national database on ABS	National database established and operational	Database developed	2015-2020	120	EAD
Conduct Valuation of Biodiversity and Develop Strategies to Promote Research and Development on Biodiversity	Identify available economic valuation data on biodiversity and compile it and determine data gaps	Available data on economic valuation of biodiversity identified and compiled	2 reports compiled	2015-2016	50	EAD, Academic and Research institutions
	Identify Institutions that can carry out economic valuation of biodiversity	Institutions identified and consulted	4 institutions identified	Dec 2015	20	EAD
	Identify and train local experts in valuation methods	Local experts identified and trained	5 experts identified	2015-2016	20	EAD, Academic and Research Institutions, Regional and International Partners
	Conduct economic valuation studies on biodiversity	Economic valuation studies conducted	6 economic valuations studies conducted	2015-2022	500	EAD, Academic and Research Institutions, Regional and International Partners

Key Area	Activity	Expected Output	Target	Timeframe	Budget (USD '000)	Responsible
	Consolidate economic valuation reports on biodiversity and make them available on the CHM	Economic valuation reports on biodiversity made available	4 reports published	2015-2016	100	EAD
Establish Institutional Arrangements and Administrative Systems to Effectively Monitor Biodiversity	Empower the National Biodiversity Steering Committee and other organization's to monitor implementation of the NBSAP	Meetings frequently conducted to update the National Biodiversity Steering Committee	40 meetings conducted	2015-2025	200	EAD, NCST, Biodiversity Steering Committee
	Strengthen herbarium institutions by mobilizing equipment and material support to specialized departments, e.g. border crossings, control units for ABS and IAS management	Materials procured	Equipment procured for 3 institutions	2015-2022	1,000	EAD, Development Partners
Develop Mechanisms for Promoting Cooperation and Management of Trans-Boundary Biodiversity	Identify trans-boundary biodiversity and document it	Shared biodiversity and genetic resources with potential economic value identified	Inventory of trans-boundary GR produced and published	2015-2016	500	EAD, Local Government
	Identify key bodies in which national delegates should be represented and connected to	Key national representatives identified and linked to national, regional and international organizations of importance to the implementation of the NBSAP	20 key national representatives identified	2015-2017	30	EAD
	Participate in appropriate regional and international meetings and capacity-building programmes	Malawi in line and up-to-date with regional and international activities and proceedings	Over 50 meetings attended	2015-2025	2,000	EAD
	Disseminate international, regional and national information in meetings	Malawi aware of the international and regional situation on biodiversity	Over 50 reports presented to the general public	2015-2025	1,000	EAD, Ministry Responsible for Information
Develop and Implement a Resource Mobilization Strategy for Implementation of the Nagoya Protocol	Identify human resources important for implementation of the NBSAP	Legal, technical and administrative experts important for implementation of the NBSAP identified and included in the implementation process	15 experts identified	2015-2016	50	EAD, NCST, Justice

ANNEXE 4: MONITORING AND EVALUATION PLAN

Objectives/ Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
Objective 1: Improve Capacity and Knowledge on Biodiversity Issues	**Outcome Indicator 1:** Trend in accessibility of scientific/technical/ traditional knowledge and its application	0	25%	Evaluation Report	Annual	Administrative Data	EAD
	Output Indicators A National Biodiversity Information Facility Established	0	1	Progress Report	Annual	Annual Reviews	NCST, EAD
	An updated inventory of institutions involved in biodiversity issues	0	3	Inventory Report	Annual	Administrative Data	EAD, NHBGM
	Number of biodiversity gaps and priority research areas identified	0	2	Study Reports	Annual	Research Study	Academic Institutions
	Number of institutions with the capacity to carry out biodiversity research	3	5	Capacity Evaluation Reports	Midterm and final	Research Study	EAD/Academic Institutions
	Number of biodiversity research programs implemented	0	5	Evaluation Report	Midterm and final	Administrative Data	EAD, NCST, Academia
	Number of institutions with the capacity to manage and monitor implementation of biodiversity programs	5	10	Evaluation Report	Annual	Annual Reviews	EAD
	Number of people trained to manage biodiversity	0	50	Training Reports	Annual	Administrative Data	EAD
	Outcome Indicator 2: Trend in the degree to which traditional knowledge and practices are respected through full integration, participation and safeguards in the implementation of the NBSAP	0	20%	Evaluation/Review Reports	Midterm and Final	Sector Reviews	EAD
	Output Indicators Inventory of traditional knowledge, innovations and practices updated	0	9	Inventory Report	Annual	Administrative Data	EAD
	Number of awareness campaigns conducted	0	20	Awareness Materials Produced	Annual	Administrative Data	EAD

Objectives/ Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
	Number of community protocols developed and implemented	0	2	Community Protocols Developed	Midterm and Final	Administrative Data	EAD
	Number of best traditional knowledge and practices promoted and up-scaled	0	10	Evaluation Reports	Midterm and Final	Annual Reviews	EAD
	Outcome Indicator 3: Trends in awareness and attitudes to biodiversity	Not Established	50% of population	Evaluation Reports	Midterm and Final	Desk Reviews	EAD
	Output Indicators A communication, education and public awareness strategy for biodiversity developed and operationalized	0	1	Strategy in Place	Midterm and Final	Administrative Data	EAD
	Biodiversity integrated in primary and secondary school curricula	0	1	Curricula Guidelines Developed	Midterm and Final	Administrative Data	EAD
	Number of awareness campaigns conducted	0	50	Awareness Materials Produced	Annual	Administrative Data	EAD
	Number of active Community-Based Institutions	Not Established	50%	Progress Reports	Annual	Annual Reviews	EAD, Ministry responsible for Local Government
	Number of publications on Malawi's biodiversity developed	Not Established	30	Progress Reports	Annual	Annual Reviews	EAD
Objective 2: Mainstream Biodiversity Management into Sectoral and Local Development Planning	**Outcome Indicator 4:** Trend in integration of biodiversity and ecosystem service values into sectoral plans and development policies	0	100%	Progress Reports	Midterm and Final	Research Studies	EAD

	Output Indicators Evidence collected on the contribution of biodiversity to national economy and human well-being	0	1	Study Reports	Midterm and final	Annual Reviews	EAD
	Biodiversity poverty linkages included in the MGDS III	0	1	Strategy Evaluation Reports	Midterm and final	Research Studies	EAD
	Guidelines for integrating biodiversity into policies and plans developed	0	1	Guidelines Developed	Midterm and final	Desk Reviews	EAD
	Number of sectors integrated biodiversity conservation issues	7	20	Evaluation of Sectoral Plans, Reports and Programmes	Annual	Annual Reviews	EAD
	Number of Local Biodiversity Strategies and Action Plans developed	1	30	LBSAPs	Midterm and final	Desk Reviews	EAD and local councils
	Outcome Indicator 5: Trend in mobilization of resources for effective implementation of biodiversity programs	0	100%	Progress Reports	Midterm and Final	Desk Reviews	EAD and Ministry of Finance
	Output Indicators A Biodiversity Resource Mobilization Strategy developed and implemented	0	1	Resource Mobilisation Strategy	Midterm and Final	Desk Reviews	EAD and Ministry of Finance
	Number of ABS mechanisms and PPP promoted	2	5	PPP Contracts	Annual	Annual Reviews	EAD
	Number of market-based approaches for biodiversity conservation, including PES initiatives, developed and implemented	0	2	PES Initiatives	Annual	Annual Reviews	EAD
Objective 3: Reduce Direct Pressures on Biodiversity	**Outcome Indicator 6:** % of degraded terrestrial habitats are restored and protected	0	50%	Annual Progress Reports	Annual	Administrative Data	EAD
	Output Indicators Number of degraded habitats identified	0	5	Survey Reports	Annual	Research Studies	EAD

Objectives/ Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
	Number of habitats with high species diversity identified	5	10	Survey Reports	Annual	Research Studies	EAD
	Number of strategies and programmes for habitat restoration developed and implemented	2	5	Strategies Developed	Annual	Annual Reviews	EAD
	Number of programmes to protect habitats developed	0	2	Program Documents	Midterm and annual	Administrative Data	EAD
	Outcome Indicator 7: Trend in frequency and intensity of destructive fishing practices	100%	0%	Annual Progress Reports	Annual	Administrative Data	EAD
	Output Indicators Guidelines for watershed management developed	0	1	Guidelines in Place	Once	Administrative Data	Ministry of Water
	Number of programmes on integrated watershed management developed	0	5	Program Documents	Midterm and final	Administrative Data	Ministry of Water
	Number and type of legal water fishing gear promoted	2	5	Annual Progress Reports	Annual	Annual Reviews	Fisheries Department
	A National Wetlands Policy developed	0	1	Policy in Place	Once	Administrative Data	Ministry of Water
	Number of fish spawning areas for important fish species identified and protected	1	5	Annual Progress Reports	Annual	Administrative Data	Fisheries Department
	Number of threatened or endangered aquatic biodiversity species conserved	0	5	Annual Progress Reports	Annual	Administrative Data	Fisheries Department
	Number of strategies and plans for management of endemic fish species reviewed and implemented	0	2	Reviewed Strategies and Plans	Annual	Administrative Data	Fisheries Department
	Indices of use of illegal fishing gears in shallow waters reduced	100%	30%	Annual Progress Reports	Annual	Annual Reviews	Fisheries Department

	Outcome Indicator 8: % increase of area under forest cover	34%	38%	GIS Forestry Reports	Midterm and Final	Research Studies	Forestry Department
	Output Indicators Number of reforestation programmes reviewed and implemented	0	5	Program Documents	Annual	Administrative Data	Forestry Department
	Number of community-based programmes on conservation and sustainable use of forest biodiversity developed and implemented	2	7	Program Documents	Annual	Administrative Data	Forestry Department
	Number of improved forest management techniques promoted	3	10	Progress Reports	Annual	Administrative Data	Forestry Department
	Percentage of consumers adopting alternative sources of energy	3%	10%	Annual Progress Reports	Annual	Annual Reviews	Department of Energy
	Outcome Indicator 9: Trend in policy responses, legislation and management plans to control and prevent spread of invasive alien species	1 legislations/ plans/ policies	8 legislations/ plans/ policies	Progress Reports	Annual	Administrative Data	EAD
	Output Indicators A national invasive alien species management plan developed	0	1	Management Plan	Midterm and Final	Administrative Data	EAD
	Number of invasive alien species identified in different ecosystems	31	60	Progress Reports	Quarterly	Research Studies	EAD
	Infrastructure for management of IAS procured	0	2	Equipment Procured	Midterm and Final	Administrative Data	MRA, EAD, Ministry of Agriculture, NHBGM
	Number of awareness campaigns and capacity-building initiatives on invasive alien species conducted	0	50	Awareness Materials Produced	Annual	Administrative Data	EAD
	Number of enforcement officers trained to monitor invasive alien species	0	20	Training Reports	Annual	Administrative Data	EAD
	Number of IAS eradicated/area under IAS managed	0	20	Progress Reports	Annual	Administrative Data	EAD

Objectives/ Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
	Outcome Indicator 10: Trend in pollutant release into the environment	100%	50%	Progress Reports	Annual	Administrative Data	EAD
	Output Indicators Number of pieces of equipment for monitoring of environmental pollution procured	0	2	Equipment Procured	Midterm and Final	Administrative Data	MBS, EAD, Department of Water
	Number of capacity-building initiatives on monitoring of environmental pollution	0	10	Training Reports	Annual	Administrative Data	MBS, EAD, Department of Water
	Regulations on polluter pays principle developed and implemented	0	1	Regulations Developed	Once	Administrative Data	EAD
	Number programs to promote the reduction, reuse and recycling of wastes developed	0	2	Program Reports	Midterm and Final	Administrative Data	EAD
	Number of public-private partnerships on waste management promoted	20	50	PPP Agreement Documents	Midterm and Final	Administrative Data	EAD
	Enforcement of policy and regulatory frameworks for pollution control strengthened	0	100%	Progress Reports	Annual	Administrative Data	EAD
	Outcome Indicator 11: Trends in ecosystem resilience to climate change	0	100%	Progress Reports	Annual	Administrative Data	EAD
	Output Indicators Number of alternative energy sources promoted	3	6	Annual Progress Reports	Annual	Administrative Data	Forestry Department
	Number of sustainable livelihood programs promoted	2	5	Annual Progress Reports	Annual	Administrative Data	Forestry Department
	Number of REDD+ Programs identified and promoted	1	2	REDD+ Progress Report	Annual	Administrative Data	Forestry Department
	Number of afforestration programmes promoted	1	6	Progress Reports	Annual	Administrative Data	Forestry Department

	Number of initiatives on PES promoted	0	2	Number of Initiatives	Annual	Administrative Data	Forestry Department
	Enforcement of legislation promoted - number of court cases; number of fines	0	500	Number of Court Cases Number of fines	Annual	Administrative Data	Forestry Department
Objective 4: Improve the Status of Biodiversity	**Outcome Indicator 12:** Trend in abundance and distribution of known threatened species	2 species	20 species	Progress Reports	Annual	Research Studies	DNPW
	Output Indicators Red data list for Malawi updated	0	1	Red Data List	Midterm and Final	Research Studies	NHBGM
	Number of wildlife corridors created	2	3	Evaluation Reports	Midterm and Final	Research Study	DNPW
	Number of species reintroduced	1 park	4 parks	Progress Reports	Annual	Administrative Data	EAD, DNPW
	Number of strategies on endangered species developed and implemented	2	5	Strategies Developed	Midterm and Final	Administrative Data	DNPW
	Number of biodiversity hotspots identified	97	105	Progress Reports	Annual	Administrative Data	EAD, DNPW
	Number of National Action Plans for implementation of POWPA developed	0	1	Action Plan Developed	Once	Administrative Data	DNPW
	Outcome Indicator 13: Trend in number of effective policy mechanisms implemented to reduce genetic erosion and safeguard genetic diversity related to plant and animal genetic resources	0	2 programmes	Progress Reports	Annual	Administrative Data	Ministry of Agriculture
	Output Indicators Number of indigenous plant species cultivated and protected	10	30	Progress Reports	Annual	Research Study	MPGRC
	Number of in-situ conservation sites of wild relatives of cultivated plants established and protected	1	3	Progress Reports	Midterm and Final	Research Study	MPGRC
	Number of land races kept in gene banks and botanic gardens	30	50	Progress Reports	Annual	Administrative Data	MPGRC and NHBGM

Objectives/ Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
	Number of species collected and kept in herbarium and natural history collection	6,000	8,000	Progress Reports	Annual	Administrative Data	EAD, NHBGM, DARS, FRIM, UNIMA
	Number of collections with nutritive potential established	13	25	Progress Reports	Annual	Research Study	MPGRC
	Number of programmes aimed at promoting farmer's rights	5	10	Progress Reports	Annual	Administrative Data	EAD, NHBGM, DARS, FRIM, UNIMA
	Number of surveys to document traditional knowledge used for agro-biodiversity conservation conducted	0	10	Progress Reports	Annual	Research Studies	MPGRC
	Guidelines for collection characterization and conservation of germplasm developed	0	1	Guidelines Developed	Once	Administrative Data	MPGRC
	Number of capacity-building initiatives on collection, characterization and conservation of species	0	20	Training Reports	Annual	Administrative Data	MPGRC
	Number of pieces of equipment procured for collection, characterization and conservation of species	0	5	Pieces of Equipment	Midterm and Final	Administrative Data	MPGRC
	Number of land use maps and management plans updated	1	3	Land Use Maps	Midterm and Final	Administrative Data	Ministry of Lands
	Number of research studies on genetic variation of domesticated wild plants conducted	0	3	Study Reports	Midterm and Final	Research Studies	Ministry of Agriculture
	Mechanisms to harmonize activities of organizations dealing with agro-biodiversity conservation developed	0	1	Progress Reports	Annual	Research Studies	Ministry of Agriculture
	Number of targeted conservation research conducted	Not Known	10	Progress Reports	Annual	Administrative Data	AD, NHBGM, DARS, FRIM, UNIMA

	Outcome Indicator 14: Trend in identification, assessment and strengthening of incentives that reward positive contribution to biodiversity and ecosystem services and penalize adverse impacts	0	100%	Progress reports	Annual	Research studies	EAD
	Output Indicators Biosafety Act and regulations revised	0	1	Biosafety Act and Regulations Developed	Once	Administrative Data	EAD
	Public awareness campaigns on biosafety legislation conducted	0	20	Training Reports	Annual	Annual Reviews	EAD
	A national biosafety capacity-building plan developed and implemented	0	1	National Biosafety Capacity Building Plan	Once	Midterm Review	EAD
	A biosafety clearing house mechanism developed and operationalised	0	1	Biosafety clearing house in place	Annual Reviews	Administrative Data	EAD
	An effective monitoring system for biotechnology established	0	1	M&E Strategy Developed	Annual	Annual Reviews	EAD
Objective 5: Enhance the Benefits to All from Biodiversity and Ecosystem Services	**Outcome Indicator 15:** Trend in distribution, condition and sustainability of ecosystem services for human well-being	0	100%	Progress Reports	Annual	Research Studies	EAD
	Output Indicators Biodiversity policy and legislation framework developed	0	1	Developed Policy	Once	Administrative Data	EAD
	Number of collaborative management programs developed and implemented	0	1	Progress Reports	Annual	Administrative Data	EAD
	Number of awareness programs on biodiversity management	0	40	Progress Reports	Annual	Administrative Data	EAD
	Number of income-generating programs developed	0	10	Progress Reports	Annual	Administrative Data	EAD

Objectives/ Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
	Outcome Indicator 16: Trend in access and equity in benefit sharing of genetic resources	0	100%	Progress Reports	Annual	Annual Reviews	EAD
	Output Indicators Regulations on Access and Benefit Sharing developed and operationalized	0	1	Regulations Developed	Once	Administrative Data	EAD
	Number of sensitization and awareness activities on the ABS and IPR legislation	0	5	Progress Reports	Once Every Two Years	Administrative Data	EAD
	A valorization strategy for biodiversity in Malawi developed	0	1	Strategy Developed	Once	Administrative Data	EAD
	Number of capacity-building initiatives and trainings in negotiations, regulation and monitoring compliance of GR and TK users conducted	0	8	Training Reports	Midterm and Final	Administrative Data	EAD
	A system for monitoring and tracking compliance to ABS legislation developed and operationalised	0	1	M&E Strategy Developed	Once	Administrative Data	EAD
	Institutional and administrative structures for implementation of the Nagoya Protocol established	0	1	Structures in Place	Midterm and Final	Administrative Data	EAD
	A national mechanism for documentation, management and sharing of information related to ABS developed	0	1	Mechanisms in Place	Annual	Administrative Data	EAD

ANNEXE 5: STRATEGIC PLAN FOR BIODIVERSITY 2011-2020 AND THE AICHI BIODIVERSITY TARGETS

"Living in harmony with nature"

VISION

The vision of this Strategic Plan is a world of "*Living in harmony with nature*" where "By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people."

THE MISSION OF THE STRATEGIC PLAN

The mission of the Strategic Plan is to "take effective and urgent action to halt the loss of biodiversity in order to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life and contributing to human well-being and poverty eradication. To ensure this, pressures on biodiversity are reduced, ecosystems are restored, biological resources are sustainably used and benefits arising out of utilization of genetic resources are shared in a fair and equitable manner, adequate financial resources are provided, capacities are enhanced, biodiversity issues and values mainstreamed, appropriate policies are effectively implemented and decision-making is based on sound science and the precautionary approach."

STRATEGIC GOALS AND THE AICHI BIODIVERSITY TARGETS

Strategic goal A. Address the Underlying Causes of Biodiversity Loss by Mainstreaming Biodiversity Across Government and Society

Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out, or reformed in order to minimize or avoid negative impacts and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.

Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Strategic Goal B. Reduce the Direct Pressures on Biodiversity and Promote Sustainable Use

Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Target 6: By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Target 7: By 2020, areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated and measures are in place to manage pathways to prevent their introduction and establishment.

Target 10: By 2015, the multiple anthropogenic pressures on coral reefs and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Strategic Goal C. Improve the Status of Biodiversity by Safeguarding Ecosystems, Species and Genetic Diversity

Target 11: By 2020, at least 17% of terrestrial and inland water areas and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures and integrated into the wider landscapes and seascapes.

Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Strategic Goal D: Enhance the Benefits to All from Biodiversity and Ecosystem Services

Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

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

Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Strategic Goal E. Enhance Implementation Through Participatory Planning, Knowledge Management and Capacity-Building

Target 17: By 2015, each Party has developed, adopted as a policy instrument and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends and the consequences of its loss, are improved, widely shared and transferred and applied.

Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

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