



GOVERNMENT OF MALAWI

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

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FOREWORD

Biodiversity provides goods and services in 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.

This National Biodiversity Strategy and Action Plan II is a framework for action that will guide Malawi to sustainably manage its biodiversity. 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 grassroot 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 particularly grateful to the Global Environmental Facility through the United Nations Environment Program for the financial and technical support during the development of this strategy.

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Minister of Natural Resources, Energy and Mining

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Secretary for Environment and Climate Change

ACRONYMS AND ABBREVIATIONS

ABS	Access and Benefit Sharing
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
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
HIV/AIDS	Human Immunovirus / Acquired Immunodeficiency Syndrome
IAS	Invasive Alien Species
IBAs	Important Bird Areas
IKS	Indigenous Knowledge Systems
IPR	Intellectual Property Rights
LUANAR	Lilongwe University of Agriculture and Natural Resources
MEET	Malawi Environmental Endowment Trust
MGDSII	Malawi Growth and Development Strategy II

MMCT	Mulanje Mountain Conservation Trust
MoAIWD	Ministry of Agriculture, Irrigation and Water Development
MoECCM	Ministry of Energy and Climate Change Management
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
PPP	Public Private Partnerships
THA	Traditional Healers Association
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 (NBSAP II) provides Malawi's strategies and action plans for the management of biodiversity from 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 2011-2020.

The strategy aims to enhance Malawi's conservation and sustainable use of biodiversity for the environment and human wellbeing. This strategy is a key element in ensuring that biodiversity contributes significantly to economic development and poverty alleviation in Malawi.

This strategy describes Malawi's unique biodiversity, which comprise a variety of ecosystems and species. The greatest diversity of these species in Malawi are in protected areas, comprising 87 Forest Reserves, Five National Parks and Four Wildlife Reserves which 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, which has over 1000 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 Forestry Research Institute of Malawi. As of the year 2014, the Malawi Genetic Resource Centre gene banks had over 4613 accessions from 32 species and of these 4097 are seed samples and 516 are vegetative materials collected from all districts of Malawi.

Biodiversity in Malawi contributes significantly to the economy and well-being of the people of Malawi. A variety of activities that are necessary for daily life like farming, hunting, energy production, ecotourism, cultural activities depend heavily on biodiversity and the ecosystems services it provides. However, over the years, rapid population growth (annual growth rate of 2.8%), extreme poverty and overdependence on biodiversity (deforestation rate of 2.4%) have led to overexploitation, habitat loss and fragmentation of biodiversity. Owing to these losses are other factors like Invasive alien species, pollution of water and land as well as climate change which have led to reduction in species abundance in affected areas.

The major challenge for Malawi has been to ensure sustainable use of natural resources whilst addressing the pressing needs of poverty and identifying alternative livelihoods for its people. Further, even when solutions have been identified, the challenge of mobilizing human, financial and technical resources affects successful implementation of biodiversity programs. During stakeholder consultations, various stakeholders stressed the importance of ensuring adequate biodiversity research, equipment and infrastructure to support development and implementation of biodiversity programmes all of which require finances. Concerns also exist on the lack of framework legislation on biodiversity and weak coordination amongst institutions involved in biodiversity management. To address these concerns and achieve the major goal for Malawi of enhancing conservation and sustainable use of biodiversity for the environment and human well-being, specific strategic objectives and actions for ensuring effective implementation of the strategies have been developed. Five major strategic objectives on which Malawi will focus on up to 2025 have been developed as listed below;

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

With a view to attaining these objectives, 16 targets and a set of actions which outline tasks and responsibilities that should be undertaken to ensure that the strategic objectives are met have been developed. Priority will be given to enhancing coordination amongst all parties involved in implementation to enhance an ecosystem based approaches and prevent fragmentation of activities. The supervision and monitoring of operations will also be strengthened with a view to improving and ensuring the time completion of expected actions by all parties involved in the implementation of the strategy. To support these actions, coordination mechanisms and 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 1:

OVERVIEW OF BIODIVERSITY STATUS, TRENDS AND THREATS

1.1 Background

Malawi is located in the southern part of Africa with a total area of 119,140 km² 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 /km² and population growth rate of 2.8% per annum (GoM, 2012). This population is highly dependent on biological resources for its livelihood.

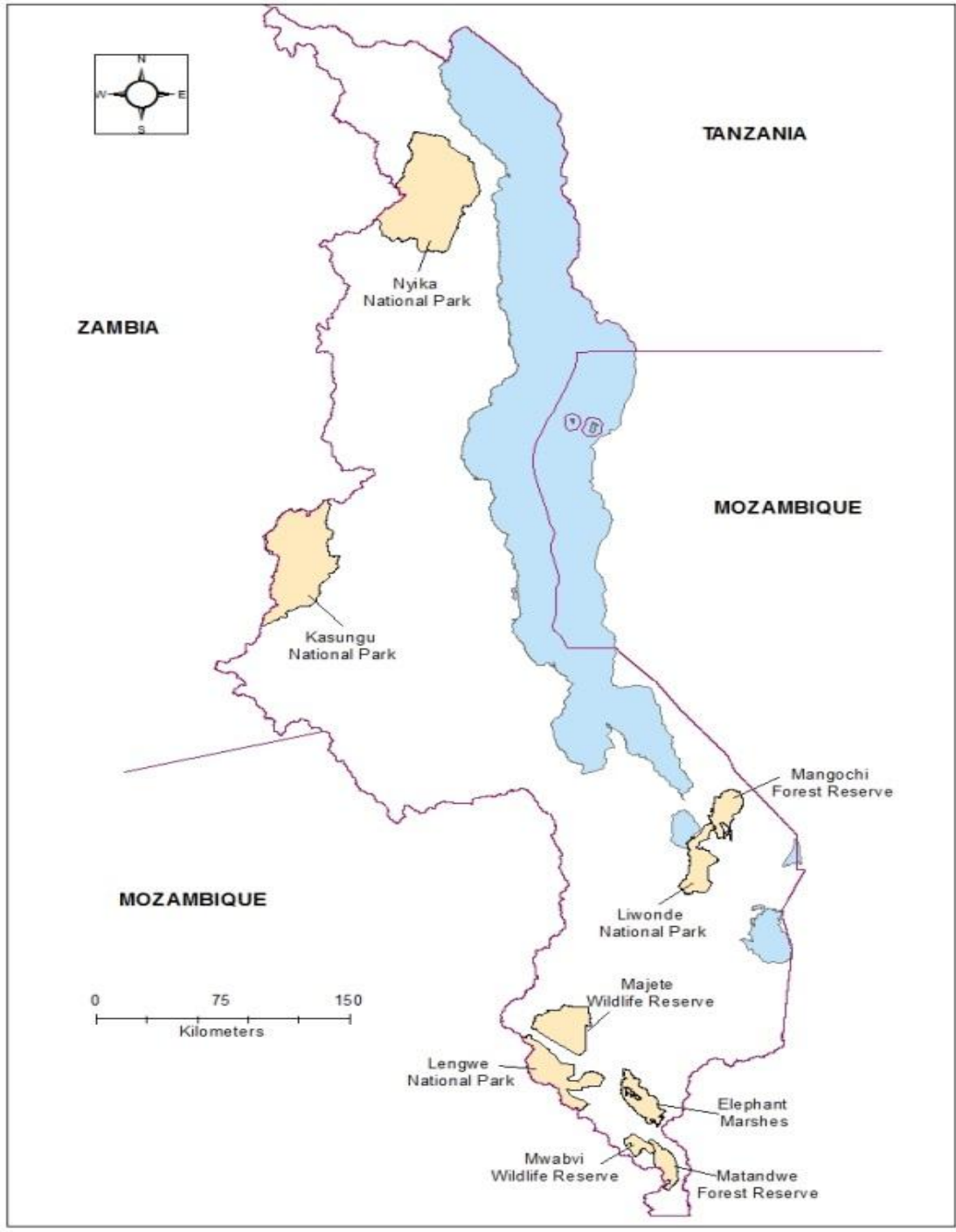


Figure 1: Map of Malawi

The country is endowed with a diversified natural resource base, which comprises abundant water resources, 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, 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 prioritizes 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 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, promotion of eco-tourism, and 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 worships their ancestral spirit M'bona in Khuluvi Forest. Gule wa Mkulu from the Chewa tribe and 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 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, which are used as medicinal plants. For example, the red fiber of the Baobab fruit (*Adonsonia 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 to 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, 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

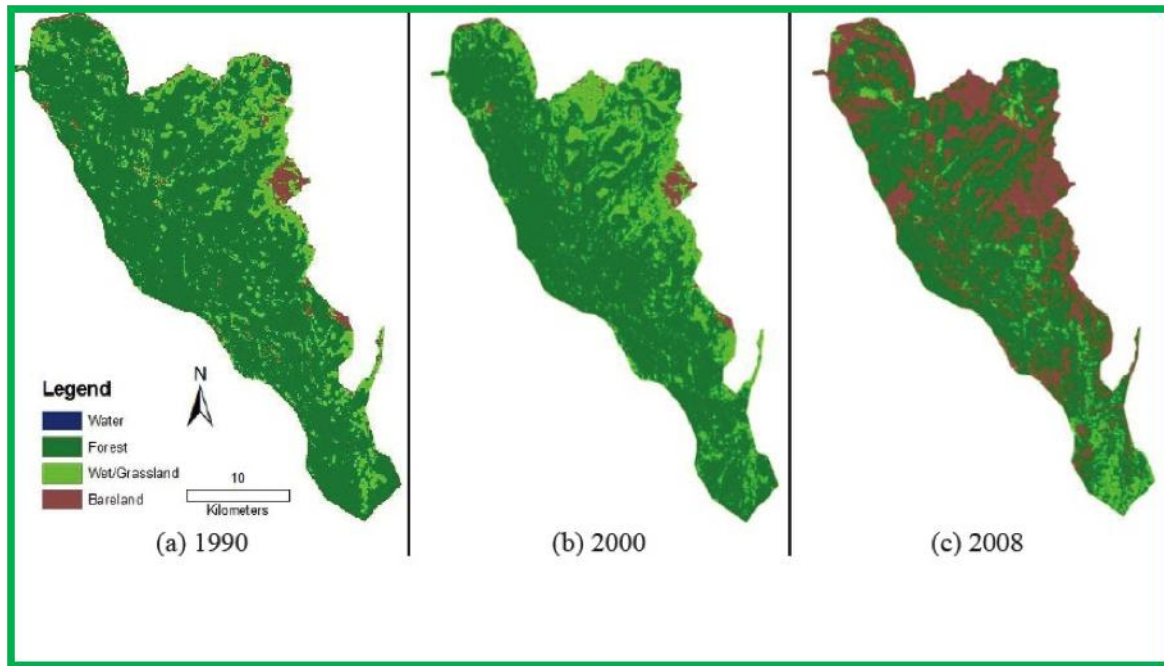
1.3.1.1 Terrestrial Ecosystems

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 MK2, 918, 050 (U\$18, 238) in 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; 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 grasslands and wetlands as the second dominant land cover in the reserve as shown in Figure 2 below.



Source: Munthali et al, 2012.

Figure 2: Land Cover Change in Dzalanyama Forest Reserve

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 km² and drains a catchment area of 100,500 km². 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 have 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 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 and 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 most of indigenous vegetables. Other factors that have led to loss of local crop landraces 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 shows 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).

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.

Table 1: Species diversity in Malawi

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

Source: Malawi's Fifth Report to CBD, 2014

As seen from the table above, 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.

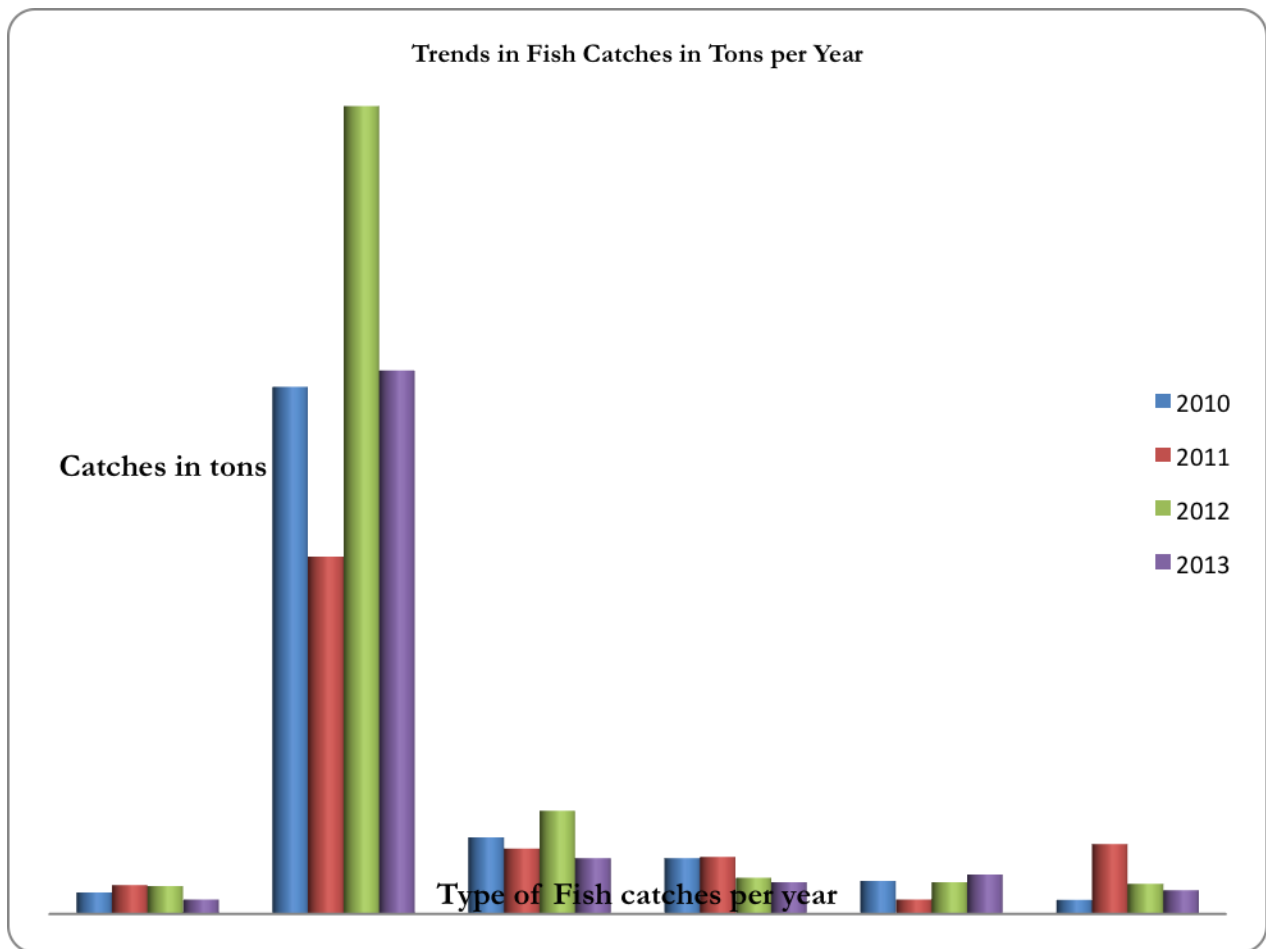


Figure 3: Trends in Fish Catches in tons per year in Lake Malawi

From the figure above, 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 the table that Usipa (*Engraulicypris engraulicyprisardella*) 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 a result of illegal fishing as well as overfishing. The enormous 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 severe decline in numbers, especially in recent years, mainly due to poaching and habitat loss. 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 below. This is attributed to the Nyika Vwaza Transfrontier Project, which is aimed at sustainably managing the Nyika Vwaza Conservation area.

Table 2: Comparative figures of large mammal populations in Nyika National Park for 2009 and 2013 Survey results.

Mammal Species	Year	
	2009	2013
Elephant	0	47
Eland	656	625
Roan	341	461
Zebra	112	279
Reedbuck	471	1787
Bushbuck	10	51
Warthog	24	106
Duiker - Common	10	93
Duiker - Red	0	2
Bushpig	18	0
Klipspringer	0	10
Total	1642	3461

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 National Plant Genetic Resource Centre, Agricultural Research Stations, Botanical Gardens, Academic institutions and Forestry Research Institute of Malawi. The Malawi Genetic Resource Centre gene bank has over 2513 accessions from 32 species and of these 2344 is seed samples and 169 are vegetative materials collected from all districts of Malawi. (MPGRC report, 2013)

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 (MZ) 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 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.

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 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 bush fires 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.

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 percent 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 percent 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 used charcoal for cooking, 41.8% used firewood and only 13.6% used electricity for cooking (NSO, 2008). 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 favored 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.

Invasive Alien Species

Invasive Alien Species in Malawi cover both terrestrial and aquatic ecosystems and are in 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 effect on biodiversity by reducing oxygen content in the aquatic ecosystems. This IAS 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 \$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 costed \$12 million to repair. Measures to control water hyacinth started in the 1990s, when its impacts on the country's watercourses 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 plant in localized areas and private dams is still prevalent.

Other IAS like *Pinus patula*, *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, 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 been 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 need to conduct comprehensive assessment and documentation of IAS and to 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 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.

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 agriculture chemicals 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 percent of the total wastes generated (20,754 tones) 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 into the rivers.

Although air pollution is not yet a big environmental problem in Malawi, generally 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 bush-fires 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.

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).

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 leading to losses in fish stocks.

Changes in the rainfall pattern have affected the growing 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 Mt. 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, per-com, 2014).

Through the National Climate Change Program, The Sustainable Land Management and ENRM programs, government has been sensitizing people on the need for replacing tree cover in fragile ecosystems to ensure that the occurrences of floods are reduced in the rainy season.

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 below highlights some of the legislation, their gaps and areas of conflict that prevent effective regulation of biodiversity conservation in Malawi.

Table 3: Provisions and gaps on Biodiversity in some ENRM policies in Malawi

POLICY	PROVISIONS FOR BIODIVERSITY	Gaps /Area of Conflict in Policy
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.
Environmental Management Act (1996)	The Act provides for establishment of environmental protection areas and conservation of biological diversity and access to genetic resources. It also makes the provision of preparation of National Environment Actions Plans (NEAP), conducting of 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 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	To strengthen institutional capacity by involving various	Section 3(7) of Fisheries Conservation and Management Act

<p>Management Act (1997)</p>	<p>stakeholders in the management of fisheries; promotes community participation and protection of fish; and provides for establishment and operation of aquaculture.</p>	<p>does not recognize water officials as fisheries protection officers.</p> <p>Section 20 and 21 of Fisheries Conservation and Management Act are silent on EIA in granting of an aquaculture permit. The Act is being revised.</p>
<p>National Parks and Wildlife Act, 2004</p>	<p>The Act provides for wildlife management, including identification of species, which should be designated for protection.</p>	<p>Section 23 of National Parks and Wildlife Act does not give prescription of projects that are required for EIA as stipulated in Section 24 of EMA.</p>
<p>Water Resources Management Policy (2004)</p>	<p>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, and 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.</p>	<p>The policy does not provide guidelines for the conservation and sustainable use of aquatic biodiversity</p>
<p>Land Policy, 2002</p>	<p>Promotes community participation and public</p>	

	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 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 & Botanic Gardens of Malawi.	

1.5.2 Institutional Framework

Malawi has an institutional arrangement aimed at creating an enabling environment for implementation of the 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) informs 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). 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) coordinates biodiversity issues in the district and Village Natural Resource Based Committees (VNRMCs) coordinate biodiversity activities at 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 always not 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 gene bank. 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 integrates 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 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) which 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 Environmental Affairs Department, which is the National focal point for 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 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 (outlined in Appendix 1) in the process, 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 1

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 that 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 ecosystem 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 the 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 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 ensures 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, analyze, interpret and act on biodiversity data is often insufficient; and existing staff are frequently needed to fulfill 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 2: STRATEGY FOR BIODIVERSITY MANAGEMENT IN MALAWI

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 wellbeing. 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 which 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 co-operation 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) 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.

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 National Herbarium and Botanic Gardens of Malawi (NHBGM), Museums of Malawi, Fisheries

Department (FD), Agricultural Research Stations, Forestry Research Institute of Malawi (FRIM), Academia, NGO's and Civil Society Organizations among others.

Similarly, human and institutional capacities are important in biodiversity management. Government and other organizations have made efforts to strengthen capacity on biodiversity management through training provided by institutions such as 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) Update an inventory of institutions that are involved in biodiversity research and management;
- b) Assess knowledge gaps and identify priority research areas;
- c) Enhance institutional capacity to manage and monitor implementation of biodiversity programmes;
- d) Increase the number of programmes on biodiversity research.
- e) Strengthen the capacity of training institutions on biodiversity research and dissemination;
- f) Strengthen human capacity to manage biodiversity.

Output Indicators

- a) An updated inventory of institutions involved in biodiversity issues;

- b) Number of biodiversity gaps and priority research areas identified;
- c) Number of institutions with capacity to carry out biodiversity research;
- d) Number of Biodiversity Research Programmes implemented;
- e) Number of institutions with the capacity to manage and monitor implementation of biodiversity programs; and
- f) Number of people trained to manage biodiversity.

Responsible Institution: Environmental Affairs Department, National Commission for Science and Technology, Department of Agricultural Research Services, Department of Livestock and Animal Health, Museums of Malawi, National Herbarium and Botanic Gardens of Malawi, Forestry Research Institute of Malawi, Department of National Parks and Wildlife, Fisheries Department, Ministry of Agriculture, Irrigation and Water development, NGO's, CSO's 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 knowledge 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 knowledge practices.

Output Indicators

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

Responsible Institutions: Environmental Affairs Department, Ministry of Natural Resources, Energy and Mining, Department of Culture, Department National Parks and Wildlife, Ministry of Local Government and Rural Development, National Herbarium and Botanical Gardens of Malawi, Forest Research Institute of Malawi, Department of Forestry, National Commission for Science and Technology, Department of Agricultural Research Services, Museums of Malawi, Academia, Ministry of Justice, Traditional Institutions, NGO's and CSO's.

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 Natural Resources Management (CBNRM) institutions such as Village Natural Resource Management Committees (VNRMCs), Area Development Committees (ADC), Beach Village Committees (BVCs) and Wildlife Clubs.

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 CBNRM programs on biodiversity promoted;

Responsible Institutions: Ministry of Natural Resources, Energy and Mining, Environmental affairs Department, Department of Forestry, Department of National Parks and Wildlife, Ministry of Information, Tourism and Civic education; Media, Ministry of Economic Planning and Development, Ministry of Finance, Ministry of Education, Science and Technology, NHBG, Private Sector and Non-Governmental Organizations, Ministry of Local Government and Rural Development and Academia.

2.5.2 Strategic Objective Two: Mainstream biodiversity in 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 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 creating 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 national economy and human wellbeing;
- 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) Develop Local Biodiversity Strategies and Actions Plans (LBSAP's).

Output Indicators

- a) Evidence collected on the contribution of biodiversity to national economy and human wellbeing;
- b) Biodiversity poverty linkages included in the MGDS III;
- c) Guidelines for integrating biodiversity into policies and plans developed;
- d) Number of Local Biodiversity Strategy and Action Plans developed;

Responsible Institution: Ministry of Natural Resources, Energy and Mining, Environmental Affairs Department, Ministry of Finance and Economic Development, Department of Forestry, Department of Fisheries, National Herbarium and Botanic Gardens of Malawi, Department of National Parks and Wildlife, National Commission for Science and Technology, Ministry of Agriculture, Irrigation and Water Development, Ministry of Local Government and Rural Development, Non-Governmental Organizations, Private sectors and Academia.

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

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 initiatives on 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 PES initiatives developed and implemented.

Responsible Institutions: Environmental Affairs Department, Ministry of Natural Resources, Energy and Mining, Ministry of Finance and Economic Development, Ministry of Local Government and Rural Development, , Ministry of Trade and Industry, Non-Governmental Organizations, 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 unprecedented rate mainly due to human induced causes such as deforestation, encroachment into protected areas, poaching, over fishing, bush fires, 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 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 of Natural Resources, Energy and Mining, Environmental Affairs Department, Department of Forestry, Department of Fisheries, Ministry of Agriculture, Irrigation and Water Development, National Herbarium and Botanic Gardens of Malawi, Department of National Parks and Wildlife, Forestry Research Institute of Malawi, NGO's and CSO's.

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 fishing gear that exploit deep water fish;
- d) Develop a national wetlands policy;
- e) Identify and protect fish spawning areas for important species;
- f) Undertake ex-situ and in-situ conservation of threatened or endangered aquatic species;
- g) Review and implement strategies and plans for management of endemic fish species;
- h) Promote use of legal fishing gears in shallow waters.

Output indicators

- a) Guidelines for watershed management developed;
- b) Number of programmes on integrated watershed management developed;
- c) Number and type of deep 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) Reduction in use of illegal fishing gears in shallow waters.

Responsible Institutions: Ministry of Natural Resources, Energy and Mining, Environmental Affairs Department, Department of Fisheries, Ministry of Agriculture, Irrigation and Water

Development, Department of National Parks and Wildlife, Department of Forestry, Academia, Private Sector, NGO's and CSO's.

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

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 favorable 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) Number of alternative sources of energy adopted and promoted.

Implementing Institutions: Ministry of Natural Resources, Energy and Mining, Environmental Affairs Department, Department of Forestry, Energy Department, Ministry of Agriculture and Food Security, National Herbarium and Botanic Gardens of Malawi, Department of National Parks and Wildlife, Forestry Research Institute of Malawi, Private Sector, Non-Governmental Organizations and CSO's.

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 a 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 on 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 for management of IAS;
- 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 of Natural Resources, Energy and Mining, Department of Forestry, Department of Agricultural Research Services, Forestry Research Institute of Malawi, National Herbarium and Botanical gardens of Malawi, Academia, Department of Fisheries, Ministry of Trade and Industries, Malawi Revenue Authority, Environmental Affairs Department and National Commission for Science and Technology.

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

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 partnership 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 partnership on waste management promoted;
- f) Enforcement of policy and regulatory frameworks for pollution control strengthened.

Responsible Institution: Ministry of Natural Resources, Energy and Mining, Environmental Affairs Department, Forestry Research Institute of Malawi, Department of Forestry, Department of Agricultural Research Services, National Herbarium and Botanical Gardens of Malawi, Academia, Fisheries Department, Ministry of Trade and Industries, Malawi Revenue Authority, Malawi Bureau of Standards, 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 support efforts to reduce the negative effects of climate change. Conserved or restored terrestrial habitats increase 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 afforestation programmes promoted;
- e) Number of initiative on payment of ecosystem services promoted;
- f) Number of court cases;
- g) Number of fines.

Responsible Institutions: Ministry of Natural Resources, Energy and Mining, Environmental Affairs Department, Department of Forestry, Department of Fisheries, Ministry of Agriculture, Irrigation and Water Development, Department of Land Resources, National Herbarium and Botanic Gardens, NGOs, Private Sector, Department of National Parks and Wildlife, NGO's, CSO's and Academia.

2.5.4 Strategic Objective Four: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

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 and 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.

Government is implementing a number of programs to safeguard the status of ecosystems, species and genetic diversity. These include among others, the establishment of 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.

Aquatic species as is the case with terrestrial species do become extinct in life. This is the situation where the populations become drastically reduced and that their presence is no longer appreciated. In Malawi, fish species such as Nchila have been lost to extinction. Some species such as Chambo are experiencing localized extinction. Some conservation measures including restocking programs are therefore being considered to have their status improved and sustained.

Actions

- a) Update the National Red Data List;
- b) Increase connectivity between protected areas;
- c) Reintroduce species that have been locally extinct ;
- d) Develop and implement strategies to manage threatened species;
- e) Identify areas to be designated as biosphere reserves;
- f) 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 big 5 reserves;
- d) Number of strategies on endangered species developed and implemented;
- e) Number of areas identified and designated as biosphere reserves;
- f) National Action Plan for implementation of POWPA developed.

Responsible Institution: Ministry of Natural Resources, Energy and Mining, Department of Forestry, Malawi Plant Genetic resources Centre, Department of Agricultural Research Services, National Herbarium and Botanical Gardens of Malawi, Department of National Parks and Wildlife, Fisheries Department, Ministry of Trade and Industry, Malawi Revenue Authority, Environmental Affairs Department and the Private Sector.

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

Agro-biodiversity contributes to food security; 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, characterisation and conservation of species;
- d) Procure equipment for collection characterisation 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) Identify and protect wild relatives of cultivated plants;
- j) Maintain and promote local land races by establishing local community and provincial gene banks;
- k) Integrate Intellectual Property Rights into framework legislation on biodiversity management;
- l) Promote the collection of plant species to establish their nutritive potential.
- m) Promote farmers rights; and collaborate on prioritization.

Output Indicators

- a) Number of indigenous plant 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) Intellectual Property Rights integrated into framework legislation;
- e) Number of collections with nutritive potential established;
- f) Farmers' rights promoted.
- g) Number of surveys to document traditional knowledge used for agro-biodiversity conservation conducted;
- h) Guidelines for collection, characterisation and conservation of germ-plasm developed;
- i) Number of capacity building initiatives on collection, characterisation and conservation of species;
- j) Number of pieces of equipment procured for collection characterisation 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 organizations dealing with agrobiodiversity conservation developed.

Responsible Institutions: Ministry of Natural Resources, Energy and Mining, Environmental Affairs Department, Department of Agricultural Research Services, National Herbarium and Botanical Gardens, Academia and Non-Governmental Organizations, Ministry of Justice and Constitutional Affairs, Ministry of Local Government and Rural Development, Department of Livestock and Animal Health, Malawi Plant Genetic Resource Centre and Traditional Healers Association of Malawi

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 which 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.

2.5.5 Strategic Objective Five: Enhance the benefits to all from biodiversity and ecosystem services

Ecosystems provide goods and services, which are particularly important for human wellbeing. 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 poor and the vulnerable.

Actions

- a) Develop policy and legislative framework 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 and support livelihood's and address gender issues (e.g. bee keeping; energy efficient stoves)

Output Indicators:

- a) Biodiversity policy and legislation framework 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 of Natural Resources, Energy and Mining, Department of National Parks and Wildlife, Department of Forestry, National Herbarium and Botanical Gardens of Malawi, Department of Fisheries, Environmental Affairs Department, Ministry of Agriculture

and Food Security. Ministry of Local Government and Rural Development, Ministry of Gender, Children, Disability and Social Welfare, NGOs and CSOs.

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

Actions

- (a) Develop legislation on ABS and IPR;
- (b) Conduct sensitization 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 negotiation, regulation and monitoring compliance of GR and 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 ABS-CH.

Output Indicators

- a. Regulations on Access and Benefit Sharing and IPR developed and operationalised;
- b. Number of Sensitization 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 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 of Natural Resources, Energy and Mining, Environmental Affairs Department, Department of National Parks and Wildlife, Department of Forestry, National Herbarium and Botanical Gardens of Malawi, Department of Fisheries, Ministry of Agriculture, Irrigation and Water Development, Ministry of Local Government and Rural Development, Ministry of Gender, Children, Disability and Social Welfare, Ministry of Tourism, information and culture, Ministry of Trade, Ministry of Justice and Constitutional Affairs, NGO's and CSO's.

CHAPTER 3: IMPLEMENTATION ARRANGEMENTS

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 of Natural Resources, Energy and Mining through Departments of Environmental Affairs, Climate Change and Meteorological Services, Mining, Energy and Forestry;
- b) Ministry of Information, Tourism and Civic Education through the Departments of National Parks and Wildlife; Museums of Malawi, and Tourism;
- c) Ministry of Agriculture Irrigation and Water Development through Departments of Fisheries, Crop Production, Agricultural Research Services, Livestock and Animal Health, Water Development and Irrigation;
- d) Ministry of Finance and Economic Development;
- e) National Commission for Science and Technology;
- f) Ministry of 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 organisations participate. The organisations 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 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,
- enforcement of legislation, capacity building, setting of standards, compliance monitoring
- Identifying fragile ecosystems, biodiversity hotspots and threatened species that need protection and where required ensuring fulfillment 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.

3.3.2 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) Providing relevant guidance and support at national, district and local levels on biodiversity management;
- d) Collecting and disseminating information on activities affecting biodiversity; and
- e) Collaborating with 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 (DDP's);
- 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;

3.3.4 Civil Society, Non-Governmental Organisations (NGOs) 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 (CBOs) 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) Contribute human and financial resources to support biodiversity conservation programmes.

3.3.5 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:

- Train students and staffs on biodiversity management;
- Mobilizing financial resources for the implementation of biodiversity targets as set in the NBSAP II;
- Build specifically designed infrastructure for biodiversity management;
- Undertake biodiversity research and increase dissemination of information on biodiversity.

3.3.6 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, legislative 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 and informs cabinet on the state of the environment. Cabinet Committee provides 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.

3.4 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 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.

3.4.1 Approaches and Audience

This strategy seeks to successfully communicate key messages on the implementation of 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.

3.4.2 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;

- Website (nccp.mw.org; www.chmmw.org),
- Regular newsletter,
- 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 targeted audience. Resources will be mobilized to implement this strategy.

3.4.3 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 below 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.

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 brief.
Local communities	To inform and build awareness of the need to conserve biodiversity	Meetings, workshops, media, Film/documentaries, drama,

	and encourage their participation in biodiversity conservation	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 documentary
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	Targeted meetings, workshops, Internet, fact sheets, briefs, radio, research publications, reports, brochures, seminars

	conservation	
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

3.5 Financing the implementation of the NBSAP II

The implementation of the strategy will take a programme based approach with participation of various stakeholders. However, 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.

3.6 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 annexed. This will form a basis for periodic reviews to establish progress made. To effectively monitor the implementation of activities under this strategy, 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, NGO'S, Private Sector etc;
- Annual reports from Ministry of Natural Resources, Energy and Mining;
- Periodic national reports to the CBD.

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ANNEXE 1: LIST OF STAKEHOLDERS CONSULTED

GOVERNMENT MINISTRIES AND DEPARTMENTS	
Alban Pulaizi	Department of Fisheries
Annie Mapulanga	Ministry of Natural Resources, Energy and Mining
Bernard Chimera	Department of Livestock and Animal Health
Christopher Salema	Museums of Malawi
Jameson Kamwendo	National Herbarium and Botanical Gardens of Malawi
Jester Kaunga Nyirenda	Department of Parks and Wildlife
Lovemore Nyongo	Ministry of Natural Resources, Energy and Mining
Luka Nyirongo	Ministry of Natural Resources, Energy and Mining
Moffat Manase	Department of Fisheries
Montfort Mwanyambo	National Herbarium and Botanical Gardens of Malawi
Mpeta K.M. mwanyongo	Environmental Affairs Department
Nolipher Mponya	Malawi Plant Genetic Resources Centre
Shamiso Najira	Environmental Affairs Department
Tawonga Mbale	Environmental Affairs Department

Titus Zulu	Forestry Department
Tiwonge Gawa	Museums of Malawi
Victoria Kachimera	Environmental Affairs Department
William Simwanza	Ministry of Finance and Economic Development
RESEARCH AND HIGHER LEARNING INSTITUTIONS	
Dr. Chimwemwe Mhango	Chancellor College
Edwin Chiwona	Lilongwe University for Agriculture and Natural Resources
Gerald Meke	Forestry Research Institute of Malawi
James Kazembe	Lilongwe University for Agriculture and Natural Resources
Leonard Manda	Mzuzu University
Tembo Chanyenga	Forestry Research Institute of Malawi
Wilson Jere	Lilongwe University for Agriculture and Natural Resources
CIVIL SOCIETY	
Bright Phiri	Centre for Environmental Policy and Advocacy
Gelvazio Thamala	Wildlife Environmental Society of Malawi
Khumbo Kamanga	Coordination Union for the Rehabilitation of the Environment

Reginald Mumba	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
Leonard Manda	Biodiversity Conservation Initiative
Samuel Kamoto	Majete Wildlife Reserve
Yohane Chimbalanga	National Commission for Science and Technology
	Ripple Africa
INTERNATIONAL ORGANISATIONS	
David Chalmers	USAID
George Phiri	Food and Agriculture organisation
	WorldFish Centre
	ICRISAT

ANNEXE 2: IMPLEMENTATION PLAN FOR NBSAP II

STRATEGIC OBJECTIVE 1: Improve capacity and knowledge on biodiversity issues																
National Targets	Relevant Aichi Biodiversity Target	Actions	Timeframe (2015-2025)											Responsible Institutions	Estimated Cost (USD '000)	Possible sources of funding
			1	2	3	4	5	6	7	8	9	10				
Target 1: By 2024, 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 shares and transferred, and applied	a) Update an inventory of institutions that are involved in biodiversity research and management; b) Assess knowledge gaps and identify priority research areas; c) Enhance institutional capacity to manage and monitor implementation of biodiversity programmes; d) Increase the number of programs on biodiversity research e) Strengthen the capacity of training institutions on biodiversity research and dissemination; f) Strengthen human capacity to manage biodiversity.												MoNREM, EAD, Academia, NCST, DARS, NHBGM, Department of Livestock and Animal Health, Museum of Malawi, FRIM, DNPW, Fisheries Research Unit, Fisheries Department.	5,000	Multilateral Bilaterals like World Bank, African Development Bank, Norwegian Embassy, FAO, DFID, USAID, IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector

<p>Target 2: By 2025, traditional knowledge, innovations and practices of local communities are respected and harnessed in line with national and international legislation</p>	<p>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.</p>	<p>a) Update an inventory of traditional knowledge systems, innovations and practices in Malawi</p> <p>b)</p> <p>c) Conduct awareness campaigns among communities, researchers and NGOs to raise the profile on the value of traditional knowledge;</p> <p>d)</p> <p>e) Facilitate development of community protocols on traditional knowledge, practices and innovations;</p> <p>f) Promote and upscale best traditional knowledge practices.</p>	<p>[Shaded cells]</p>	<p>Department of Culture, DNPW, MoLGRD, NHBGM, EAD, DoF, DF, NCST, Museums of Malawi</p>	<p>3,000</p>	<p>UNEP,UNDP, WB,Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector</p>
<p>Target 3: By 2025, At least 50% of the Malawi population is aware of the</p>	<p>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</p>	<p>a) Develop a communication, education and public awareness strategy for biodiversity;</p>	<p>[Shaded cells]</p>	<p>EAD, DoF, DNPW, MoI, Media, MoEP&D, MoF, NHBGM, Private Sector,</p>	<p>2,000</p>	<p>UNEP,UNDP, WB,Norway FAO, DFID, USAID IrishAid, UNICEF,</p>

values of biodiversity to ensure its conservation and sustainable use	sustainably.	<p>b)</p> <p>c) Integrate biodiversity issues into primary and secondary school curricula</p> <p>d)</p> <p>e) Conduct awareness campaigns on the importance of biodiversity;</p> <p>f) Promote active participation of local communities in biodiversity conservation through various CBNRM institutions such as DESCs, VNRMCs, ADC, BVCs and Wildlife Clubs.</p>									NGOs, MoLGRD, Academia		UNESCO, CIDA, ODA, GIZ, GoM and the private sector
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	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	<p>a) Conduct integrated ecosystem assessments and economic analyses to evaluate the specific contribution of biodiversity to national economy and human wellbeing.</p> <p>b) Integrate biodiversity poverty linkages into the Malawi Growth and</p>									EAD, MoF, MoEP&D, DoF, DF, NHBGM, DNPW, NCST, MoAFS, MoLGRD, NGOs, Private Sector and Academia.	8,000	UNEP, UNDP, WB, Norway, FAO, DFID, USAID, IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private

		fish species.													
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.	<p>a) Review and implement effective reforestation programmes that ensure survival and diversity of planted trees;</p> <p>b) Develop and implement community based programmes on conservation and sustainable use of forest biodiversity;</p> <p>c) Promote improved forest management techniques;</p> <p>d) Promote the use of alternative sources of energy.</p>											EAD, DoF, MoAFS, NHBGM, DNPW, FRIM and NGOs involved in forestry management	5,000	UNEP,UNDP, WB,Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector
Target 9: By 2025 Invasive alien species and their pathways are identified and prioritized for control and prevention from movement and spreading in	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.	<p>a) Compile documentation and maps on IAS in Malawi including an inventory of IAS prevalent in Malawi.</p> <p>b) Develop a national IAS management plan</p> <p>c)</p> <p>d) Conduct awareness campaigns and capacity building initiatives of</p>											MoECCM, DoF, DARS, FRIM, NHBGM, Academia, FD, MoT&I, MRA, EAD.	6,500	UNEP,UNDP, WB,Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector

		<p>f) Promote public private partnership on waste management.</p> <p>g) Strengthen enforcement of policy and regulatory frameworks for pollution control</p>																			
<p>Target 11: By 2025, anthropogenic pressures on vulnerable ecosystems are minimized thereby improving ecosystems resilience to climate change</p>	<p>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.</p>	<p>a) Promote alternative energy sources to fuel wood and charcoal;</p> <p>b) Promote sustainable livelihood programs such as bee keeping and mushroom production;</p> <p>c) Identify and promote REDD+ programs</p> <p>d) Promote afforestation programmes;</p> <p>e) Promote initiatives on payment of ecosystem services;</p> <p>f) Promote enforcement of legislation</p>																	<p>EAD, DoF, FD, MoAFS, NHBGM, DNPW, Department of Land Resources</p>	5,000	<p>UNEP,UNDP, WB,Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector</p>
STRATEGIC OBJECTIVE FOUR: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity																					
<p>Target 12: By 2025, the extinction of</p>	<p>Target 12: By 2020 the extinction of known threatened species has been</p>	<p>a) Update the National Red Data List;</p>																	<p>DNPW, DoF, MPGRC, NHBGM, FD,</p>	20,000	<p>UNEP,UNDP, WB,Norway FAO, DFID,</p>

<p>known threatened species is prevented and their conservation status is improved and sustained.</p>	<p>prevented and their conservation status, particularly of those most in decline, has been improved and sustained.</p>	<p>b) Increase connectivity between protected areas; c) d) Introduce species that have been locally extinct; e) Develop and implement strategies to manage threatened species; f) Identify areas to be designated as biosphere reserves. g) Develop a national plan for implementation of PoWPA</p>	<p>██████████</p>	<p>EAD</p>		<p>USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector</p>
<p>Target 13: By 2025, the genetic diversity of domesticated plants, and animals; and their wild relatives is maintained, and safeguarded</p>	<p>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</p>	<p>a. Document community practices and tradition knowledge on agro-biodiversity management; b. Develop guidelines for collection, characterisation and conservation of germ-plasm; c. Conduct capacity building initiatives on collection, characterisation and conservation of species; d. e. Procure equipment for collection characterisation and conservation of</p>	<p>██████████</p>	<p>MoECCM, EAD, DoF, DNPW, DARS, NHBGM, MoLGRD, Academia and NGOs, Traditional Healers Association of Malawi, Ministry of Justice and Constitutional Affairs.</p>	<p>18,000</p>	<p>UNEP,UNDP, WB,Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector</p>

		<p>biodiversity management;</p> <p>m. Promote the collection of plant species to establish nutritive potential.</p> <p>n.</p> <p>o. Promote farmers rights and collaborate in prioritization.</p>											
<p>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</p>	<p>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.</p>	<p>a. Revise the Biosafety act and regulations</p> <p>b. Conduct public awareness campaigns on Biosafety legislation</p> <p>c. Develop and implement a national Biosafety capacity building plan</p> <p>d. Establish national systems for documentation, management and information sharing on Biosafety</p> <p>e. Establish an effective monitoring system for biotechnology</p>										10,000	<p>UNEP,UNDP, WB,Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector</p>

STRATEGIC OBJECTIVE FIVE: Enhance the benefits to all from biodiversity and ecosystem services																				
By 2025, the supply of important ecosystems services is safeguarded and restored, taking into account gender roles and responsibilities of the poor and the vulnerable.	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.	<p>a) Develop policy and legislative framework on biodiversity management that take into account the needs of the vulnerable and gender roles;</p> <p>b)</p> <p>c) Develop and implement collaborative management programs for terrestrial and aquatic ecosystems with full participation of vulnerable groups including women.</p> <p>d)</p> <p>e) Conduct awareness campaigns in the fringes of protected ecosystems on biodiversity management from a poverty and gender perspective; and</p>																DNPW, DoF, NHBGM, FD, EAD, MoAFS, MoLGRD	10,000	UNEP,UNDP, WB,Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector

		f) Develop programs to support alternative income generating activities that can take away pressure from the ecosystems and support livelihoods and gender issues e.g. bee keeping.											
By 2025, access to genetic resources and associated traditional knowledge is regulated and benefits arising from their utilisation 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.	<p>a) Develop legislation on ABS and IPR</p> <p>b) Conduct sensitization meeting on the ABS and IPR legislation at all levels</p> <p>c)</p> <p>d) Develop a valorization strategy for Malawi</p> <p>e)</p> <p>f) Strengthen capacity of institutions an local communities o effectively participate in negotiations, regulation and monitoring compliance of genetic resources and traditional knowledge issues.</p> <p>g) Establish an effective system for monitoring and tracking compliance to ABS</p>							EAD, OPC, , MoFA, MoJ, MoTW&C DF, DoF, DNPW, MoAFS, NHBG, MoT&I	5,000	UNEP,UNDP, WB,Norway FAO, DFID, USAID IrishAid, UNICEF, UNESCO, CIDA, ODA, GIZ, GoM and the private sector		

		<p>legislation</p> <p>h) Establish institutional and administrative structures to facilitate implementation of the Nagoya Protocol in Malawi</p> <p>i) Establish an effective mechanism for documentation, management and sharing of information related to ABS and ensure effective participation in the ABS-CH</p>																
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ANNEX 3: CAPACITY BUILDING PLAN FOR IMPLEMENTATION OF 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	Time frame	Budget (USD '000)	Responsible
Update an inventory of institutions involved in biodiversity research and management and identify their needs	Conduct surveys to identify training, infrastructure needs at 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 and Research and academic 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, NCST, and Research and academic Institutions
	Identify individuals to undertake	Increase the number of programmes on biodiversity	10 Individuals	2015-2025	35	EAD, NCST and Research

	postgraduate studies or carry out research in the areas identified.	research and the amount of information available on biodiversity	identified to undertake research and studies			and academic Institutions
Promote Awareness of biodiversity issues amongst different stakeholders in Malawi	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
	Conduct Seminars and workshops for Government departments , NGO's and Local governments on NBSAP	Seminars and workshops on the NBSAP conducted	6 workshops on NBSAP conducted	June – 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 Dialogue with the private sector and other actors that utilize biodiversity to implement the NBSAP.	Round table organized	3 round tables organized	Nov 2015-july 2021	80	EAD
	Press Conferences and Releases and Policy briefs	Information on the NBSAP and its status of implementation made	5 press releases and 4 policy	2015-2025	100	EAD

		available to the general public.	briefs released			
	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 , NGO's
	Conduct Training of Trainer on NBSAP implementation	Local government officers like EDO, DFO's trained	5 TOT conducted	2015-2018	150	EAD a

	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 – 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	January 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 update	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
	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	20 key national representatives identified	2015-2017	30	EAD

		implementation of the NBSAP				
	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, 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							
	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	Mid Term 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 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	Mid Term and Final	Sector Reviews	EAD
Output Indicators							
	Inventory of tradition knowledge, innovations	0	9	Inventory	Annual	Administrative	EAD

Objectives / Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
	and practices updated			Report		data	
	Number of awareness campaigns conducted	0	20	Awareness materials produced	Annual	Administrative data	EAD
	Number of community protocols developed	0	2	Community protocols developed	Mid Term and Final	Administrative data	EAD
	Number of best traditional knowledge and practices promoted and up-scaled	0	10	Evaluation reports	Mid-term and Final	Annual Reviews	EAD
Outcome Indicator 3							
	Trends in awareness and attitudes to biodiversity	0	1	Evaluation Reports	Mid-term 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

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 CBNRM programs on biodiversity promoted	0	5	Review reports	Annually	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	1	Progress reports	Mid Term and Final	Research studies	EAD
Output Indicators							
	Evidence collected on the contribution of biodiversity to national economy and human wellbeing	0	1	Study reports	Midterm and final	Annual Reviews	EAD
	Biodiversity poverty linkages included in the MGDS III	0	1	Strategy Evaluation Reports	Mid Term 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 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	1	Progress reports	Mid-term and final	Desk reviews	EAD and Ministry of Finance
Output Indicators							
	A biodiversity resource mobilization Strategy developed and implemented	0	1	Resource Mobilisation Strategy	Mid-term and final	Desk reviews	EAD and Min of Finance
	Number of ABS mechanisms and PPP promoted	2	5	PPP	Annually	Annual reviews	EAD

Objectives / Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
				contracts			
	Number of PES initiatives developed and implemented	0	2	PES initiatives	Annually	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
	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	Mid Term and Annual	Administrative Data	EAD
Outcome Indicator 7							
	Trend in frequency and intensity of destructive fishing practices	10	0	Annual progress report	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	0	5	Program	Mid Term	Administrative	Ministry of

Objectives / Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
	watershed management developed			Documents	and Final	Data	Water
	Number of deep water fishing gear promoted (by type)	0	5	Annual progress report	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
	Outcome Indicator 8						
	% increase of area under forest cover	34%	38%	GIS Forestry reports	Mid Term 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
	Outcome Indicator 9						
	Trend in policy responses, legislation and	0	3	Progress	Annually	Administrative	EAD

Objectives / Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
	management plans to control and prevent spread of Invasive alien species			reports		data	
	Output Indicators						
	Number of invasive alien species identified in different ecosystems	31	60	Progress reports	Quarterly	Research Studies	EAD
	National Invasive alien species management plan developed	0	1	Management Plan	Mid-term and Final	Administrative Data	EAD
	Infrastructure for management of IAS procured	0	2	Equipment procured	Midterm and Final	Administrative data	MRA, EAD, Min of Agriculture, NHBGM
	Number of awareness campaigns and capacity building initiatives on invasive alien species conducted	0	50	Awareness materials produced	Annually	Administrative data	EAD
	Number of enforcement officers trained to monitor invasive alien species	0	20	Training reports	Annually	Administrative data	EAD
	Number of IAS eradicated /area under IAS managed	0	20	Progress reports	Annually	Administrative data	EAD
	Outcome Indicator 10						
	Trend in pollutant release into the environment	15	0	Progress reports	Annually	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	Annually	Administrative data	MBS, EAD, Department of Water

Objectives / Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
	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	Mid term and final	Administrative data	EAD
	Percentage increase in number of public private partnership on waste management promoted	0	100%	PPP Agreement documents	Mid term and final	Administrative data	EAD
	Enforcement of policy and regulatory frameworks for pollution control strengthened	0	100%	Progress reports	Annually	Administrative data	EAD
	Outcome Indicator 11						
	Trends in ecosystem resilience to climate change	0	100%	Progress reports	Annually	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 afforestation 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	10%	100%	Number of	Annually	Administrative	Forestry

Objectives / Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
				court cases Number of fines		data	Department
Objective 4: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity							
Outcome Indicator 12							
	Trend in abundance and distribution of known threatened species	2	7	Progress reports	Annual	Research studies	DPNW
Output indicator							
	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	Mid term and final	Research study	DPNW
	Number of big 5 reserves	2	3	Evaluation reports	Mid term and final	Research study	DPNW
	Number of strategies on endangered species developed and implemented	2	5	Strategies developed	Midterm and final	Administrative data	DPNW
	Number of areas identified and designated as biosphere reserves	1	2	Biosphere reserves	Midterm and final	Administrative data	DPNW
	Number of National Action Plan for implementation of POWPA	0	1	Developed action plan	Once	Administrative data	DPNW
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	Progress reports	Annually	Administrative data	Ministry of Agriculture
Output indicators							

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 indigenous plant species cultivated and protected	10	30	Progress reports	Annually	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	Annually	Administrative data	MPGRC and NHBGM
	IPR integrated into framework legislation	0	1	Progress reports	Midterm and final	Administrative data	EAD
	Number of collections with nutritive potential established	13	25	Progress reports	Annually	Research study	MPGRC
	Number of surveys to document traditional knowledge used for agrobiodiversity conservation conducted	0	10	Progress reports	Annually	Research studies	MPGRC
	Guidelines for collection characterisation and conservation of germplasm developed	0	1	Guidelines developed	once	Administrative data	MPGRC
	Number of capacity building initiatives on collection, characterisation and conservation of species	0	20	Training reports	Annually	Administrative data	MPGRC
	Number of pieces of equipment procured for collection, characterisation 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	0	1	Progress	Annually	Research	Ministry of

Objectives / Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
	organizations dealing with agrobiodiversity conservation developed			reports		studies	Agriculture
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	Annually	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	Annually	Annual reviews	EAD
	A national Biosafety capacity building plan developed and implemented	0	1	National Biosafety capacity building plan	Once	Midterm review	EAD
	National systems for documentation, management and information sharing on Biosafety established	0	1	Progress reports	Annually	Annual reviews	EAD
	An effective monitoring system for biotechnology established	0	1	M and E strategy developed	Annually	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 wellbeing	0	100%	Progress reports	Annually	Research studies	EAD
Output Indicators							

Objectives / Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
	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
	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	Developed regulations	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	Developed strategy	Once	Administrative data	EAD
	Number of trainings in negotiations, regulation and monitoring compliance of GR and TK users conducted	0	8	Training reports	Mid term 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

Objectives / Goals	Indicators	Baseline (2015)	Target (2025)	Data Collection & Reporting			
				MOV	Frequency of data collection	Data Collection Instruments/ Strategy	Responsibility for Data Collection
	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 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

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

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

Strategic goal D: Enhance the benefits to 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 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

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

Strategic goal E. Enhance implementation through participatory planning, knowledge management and capacity-building

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

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

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

Target 20:By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource

Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by P