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VICE PRESIDENT'S OFFICE

National Biodiversity Strategy and Action Plan (NBSAP) 2015-2020

DIVISION OF ENVIRONMENT

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For further information, please contact:
Division of Environment,
Vice President's Office,
P.O BOX 5380,
Dar es Salaam.
TANZANIA.
Phone: +255-222-2113857/2116995
Fax: +255-22-211113856/2113082
E-mail: ps@vpo.go.tz

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PREFACE

Tanzania is one of the twelve mega-diverse countries of the world endowed with different natural ecosystems that harbour a massive wealth of biodiversity. The country hosts 6 out of the 25 world renowned biodiversity hotspots hosting more than one-third of the total plant species on the continent and about 20% of the large mammal population. The Biodiversity wealth contributes significantly to the socio-cultural, economic and environmental goods and services to the country and peoples' livelihood.

Tanzania is a Party to the Convention on Biological Diversity (CBD) since 1996, and adheres to its international obligation to protect and conserve its biodiversity as a global resource. The country needs to conserve its biodiversity and in doing so it has taken a number of initiatives. As per requirements of Article 6 of the CBD, Tanzania formulated her first National Biodiversity Strategy and Action Plan (NBSAP) in 2001. In 2010, the CBD Conference of Parties (COP) which serves as the Meeting of the Parties, in its 10th meeting made a decision (decision X/2), on the Global Strategic Plan for Biodiversity 2011-2020. The Strategic Plan 2011-2020 has twenty biodiversity targets known as the Aichi targets. Parties to the convention are required to develop NBSAPs to address these targets. The NBSAP 2015-2020 therefore, seeks to address national biodiversity targets based on the national priorities that contribute to the global targets. The NBSAP 2015-2020 addresses among other things, a number of emerging issues such as climate change and variability, invasive species, GMOs, biofuel development, mining, oil and gas exploration and the continuous anthropogenic impacts that were not sufficiently addressed in the NBSAP 2001.

The preparation of the NBSAP 2015-2020 was participatory involving a broad range of stakeholders from Sector Ministries, Academic and Research Institutions, Public, Local Government Authorities (LGAs), Private sector, Media and Community Based Organisations (CBOs). Consultations with the stakeholders provided the baseline and design of the NBSAP 2015-2020, which responds to their needs and capacities to enhance ownership.

The NBSAP 2015-2020 highlights the value and contribution of biodiversity to human well-being; the causes and consequences of biodiversity loss; legal and institutional framework; lessons learned; national biodiversity targets; strategies and actions needed to mainstream biodiversity into development, poverty reduction and natural resource management plans.

In this regard, I call upon all stakeholders to participate fully in the implementation of NBSAP 2015-2020 in order to reduce loss and promote value of biodiversity with the aim to improve community livelihoods while maintaining environmental sustainability for the present and future generations.

Eng. Dr. Binilith S. Mahenge (MP)
MINISTER OF STATE
VICE PRESIDENT'S OFFICE (ENVIRONMENT)

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Biodiversity is complex transcending disciplines cutting across several institutions and individuals. The development of this National Biodiversity Strategy and Action Plan required contribution from a range of actors and contributors to ensure that a mega-biodiverse country such as Tanzania is able to sustainably conserve and protect its biodiversity. The contributors to the NBSAP 2015-2020 hail from all levels of government, civil society, national and international actors and individuals and I would like to personally recognise and appreciate the concerted efforts of those who played their part.

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ACRONYMS AND ABBREVIATIONS

ABS	Access and Benefit Sharing
AEWA	Agreement on the Conservation of African-Eurasian Migratory Waterbirds
ASCLME	Agulhas and Somali Current Large Marine Ecosystems
BMUs	Beach Management Units
BSAPs	Biodiversity Strategy and Action Plans
CAMARTEC	Centre for Agricultural Mechanization and Rural Technology
CBD	Convention on Biological Diversity
CBFM	Community Based Forest Management
CBOs	Community Based Organisations
CFMAs	Collaborative Fisheries Management Areas
CHM	Clearing House Mechanism
CIDA	Canadian International Development Agency
CITES	Convention on International Trade on Endangered Species
CMS	Convention on Migratory Species
COP	Conference of Parties
COSTECH	Tanzania Commission for Science and Technology
CSOs	Civil Service Organisations
DANIDA	Danish International Development Agency
DNA	Deoxyribonucleic Acid
DoE	Division of Environment
EAC	East African Community
EAME	Eastern African Marine Ecoregion
EAMs	Eastern Arc Mountains
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIRF	Environment Incident Report Forms
EMA	Environmental Management Act
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GBS	General Budget Support
GISP	Global Invasive Species Programme
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GMOs	Genetically Modified Organisms
GMPs	General Management Plans
IAPs	Invasive Alien Plants
IAS	Invasive Alien Species
IFAD	International Fund for Agricultural Development
IPBES	Intergovernmental Platform on Biodiversity and Ecosystem Services
IPMP	Integrated Pest Management Plan
IRBM	Integrated River Basin Management
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IUCN	International Union for Conservation of Nature
JFM	Joint Forest Management
KENBIF	Kenya Biodiversity Information Facility
LGAs	Local Government Authorities

LMOs	Living Modified Organisms
LVEMP	Lake Victoria Environmental Management Programme
MACEMP	Marine and Coastal Environment Management Project
MAFC	Ministry of Agriculture, Food Security and Cooperatives
MBREMP	Mnazi Bay and Ruvuma Estuary Marine Park
MCST	Ministry of Communication, Science and Technology
MDAs	Ministries, Departments and Agencies
MEAs	Multilateral Environmental Agreements
MIMP	Mafia Island Marine Park
MKUKUTA	Mkakati wa Kukuza Uchumi na Kuondoa Umaskini
MKUZA	Mkakati wa Kuondoa Umaskini Zanzibar
MLFD	Ministry of Livestock and Fisheries Development
MNRT	Ministry of Natural Resources and Tourism
MoU	Memorandum of Understanding
MPAs	Marine Protected Areas
MPRU	Marine Parks and Reserves Unit
NAFORMA	National Forestry Resources Monitoring and Assessment
NAP	National Action Plan
NAPA	National Adaptation Programme of Action
NBI	Nile Basin Initiative
NBS	National Bureau of Standards
NBSAP	National Biodiversity Strategy and Action Plan
NBSC	National Biodiversity Steering Committee
NBTC	National Biodiversity Technical Committee
NCAA	Ngorongoro Conservation Area Authority
NCSA	National Capacity Self-Assessment
NEAP	National Environmental and Action Plan
NEECS	National Environmental Education and Communication Strategy
NEMC	National Environmental Management Council
NEP	National Environmental Policy
NEPZ	National Environmental Policy for Zanzibar
NGOs	Non-Governmental Organisations
NPGRC	National Plant Genetic Resources Centre
NSGRP	National Strategy for Growth and Reduction of Poverty
NTEAP	Nile Trans-boundary-Environmental Action Project
NWFPs	Non-Wood Forest Products
PAs	Protected Areas
PES	Payment for Ecosystem Services
PFM	Participatory Forest Management
PMORALG	Prime Minister’s Office - Regional Administration and Local Government
POPs	Persistent Organic Pollutants
PPP	Public Private Partnership
REA	Rural Energy Agency
REDD+	Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
RGZ	Revolutionary Government of Zanzibar
SADC	Southern Africa Development Community
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
SEA	Strategic Environmental Assessment

SEAPs	Sectoral Environmental Action Plans
SIDA	Swedish International Development Cooperation Agency
SLM	Sustainable Land Management
SOPs	Standard Operating Procedures
SWA	Sanitation and Water for All Partnership
TACMP	Tanga Coelacanth Marine Park
TANAPA	Tanzania National Parks
TANBIF	Tanzania Biodiversity Information Facility
TDV	Tanzania Development Vision
TFS	Tanzania Forest Services Agency
TPRI	Tropical Pesticides Research Institute
TTSS	Tanzania Tourism Sector Survey
TWPF	Tanzania Wildlife Protection Fund
TZS	Tanzanian Shilling
UGABIF	Uganda Biodiversity Information Facility
UN REDD	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organizations
URT	United Republic of Tanzania
USAID	United States Agency for International Development
USD	United State Dollar
VPO	Vice President's Office
WMAs	Wildlife Management Areas
WWF	World Wide Fund for Nature

EXECUTIVE SUMMARY

INTRODUCTION

Tanzania boasts an extraordinary wealth of biodiversity at ecosystem, species and genetic levels and is one of twelve mega-diverse countries of the world. It is one of the top five African mega-diverse countries, hosting more than one-third of the total plant species on the continent and about 20% of the large mammal population. Benefits of biodiversity in Tanzania are far reaching from individual to local and national levels. Tanzania's economy depends significantly on Agriculture, Livestock, Forestry and Fisheries, which in total account for approximately 65% of the GDP, 60% of the total export earnings and employs over 80% of the population. Eco and sport tourism an important revenue source for the country depends heavily on the biodiversity wealth featured in the numerous globally recognised hot spots protected in a network of 16 National Parks, 3 Biosphere Reserves, 4 World Heritage Sites, 28 Game Reserves, 42 Game Controlled Areas, 38 Wildlife Management Areas, 109 Forests, 4 Marine Parks, 17 marine reserves and 4 Ramsar Sites.

Tanzania is a signatory to the Convention on Biological Diversity (CBD) of 1992 having ratified it in 1996 making the country a fully-fledged party to the convention in response to international obligations to protect and conserve its biodiversity as a global resource. At national level a functional policy and legislative framework serves to ensure that international, regional and national obligations are met at all levels from central government to the individual level. A key intervention by Tanzania was the development of a National Biodiversity Strategy and Action Plan (NBSAP) in 2001, a guidance document to realise and promote sustainable utilisation and conservation of biodiversity.

In 2010, during COP 10, the Parties to the Conference adopted decision X/2 on the Global Strategic Plan for Biodiversity 2011-2020, which included the adoption of twenty biodiversity targets also known as Aichi Targets. This decision required parties to the Convention to develop NBSAPs to address the targets. Tanzania has thus undertaken to review the NBSAP of 2001, in accordance with the guidance provided by the NBSAP forum and subject to review every five years. The NBSAP 2015-2020 therefore aims at reducing loss of biodiversity, promoting the value of biodiversity and improving community livelihoods.

This document covers Country Profile, Current Biodiversity Status and Trends; Analysis of Challenges; Policy, Legal and Institutional Framework; Threats to Biodiversity; Principles and Targets; Priority Actions and Implementation Plans.

BIODIVERSITY STATUS AND TRENDS

Tanzania's biodiversity is influenced by a number of factors including climate, altitude, anthropogenic activity and physical features. The country hosts terrestrial, coastal and marine and inland water (lakes, rivers, dams and wetlands) ecosystems. Notably these are trans-boundary, shared with the seven countries that border Tanzania.

Forests are predominant, distributed over approximately 55% of the total land area with woodlands being most common occupying about 93% of the forested area. The remaining 7% is composed of lowland forests, humid montane forest, mangrove forests and plantations. Coastal and marine ecosystems occupy about 20% of total land including coastal forests, mangroves, coral reefs, seagrass beds, sandy beaches, rocky shores and numerous islets. Freshwater resources which include lakes, rivers, springs, natural ponds, underground sources, wetlands as well as man-made reservoirs harbour important biodiversity and exhibit high endemism.

Tanzania exhibits a high degree of species endemism, which can be attributed to the complex topographical conditions and biological isolations in some areas resulting in unique microclimate and distinct ecological conditions. The country is among 15 globally registering the highest number of threatened species, with at least 900 threatened species under the IUCN Red List, 2013. This is due to increased ecosystem-wide deterioration, habitat fragmentation and degradation, and climate change.

It is estimated that Tanzania has lost at least one-third of its important ecosystems and biodiversity hosted within from forests and wooded areas over the past few decades due to agriculture expansion and urban growth. Almost 38% of Tanzania's forest cover is being lost at the rate of about 400,000 ha annually and should this continue, the country would deplete its forest cover in the next 50-80 years. Along the coast, 18% of the mangrove forest cover has been lost over a period of 25 years (1980 – 2005). Similarly, more than half of inland water ecosystems (rivers, lakes and dams) have been degraded and 90% of the wetlands are under increasing pressure losing many of their important functions.

In addition to agricultural expansion and urban growth, biodiversity is threatened by a number of issues including: overexploitation; pollution; invasive alien species; exploration and extraction of oil and gas; climate change; genetic erosion; poverty; the need for economic growth; political and social instability in neighbouring countries; culture and beliefs; inadequate awareness and knowledge; and inadequate policy, legal and institutional response.

PRINCIPLES, GOALS AND TARGETS (NBSAP 2015)

The current NBSAP is in line with the national vision 2025 articulation on the importance of biodiversity, i.e. to build a society that values all the Biodiversity richness, using it sustainably and equitably, while taking the responsibility for actions that meet both the competing requirements of the present and the legitimate claims of the future generations. Thus, consistent with Tanzania's development vision 2025, and the 2020 Aichi Biodiversity Targets, NBSAP 2015-2020 will be guided by the vision, mission and stipulated principles, goals and targets.

The Vision for the NBSAP 2015:

> *"By 2025, biodiversity and ecosystems are well protected, restored and used sustainably, ecosystem functioning maintained, so that they perpetually deliver sustainable intrinsic benefits for socio-economic development."*

The mission to realise the vision is:

> *"Take effective action to reduce biodiversity loss and ecosystem degradation, and long-term ecosystems functioning is ensured in order that by 2020 Tanzania's rich biodiversity is secured and contribution of biodiversity and other ecosystem services to the well-being and economic prosperity of the people is guaranteed, through capacity building, knowledge management, funding and mainstreaming biodiversity across government and society, and involvement of all stakeholders."*

The five defined strategic goals for intervention provide a clear guidance for the development of national targets and an action plan with priorities for biodiversity protection.

STRATEGIC GOAL A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.

Four (4) targets have been identified for the realisation of this defined strategic goal.

TARGET 1: By 2020 at least 60% of the population is aware of the importance of biodiversity and its impact on human well-being and socio-economic development of the country.

TARGET 2: By 2020, programmes for the valuation of biodiversity and payments for ecosystem services developed and integrated into national and local development strategies and plans.

TARGET 3: By 2020, incentives harmful to biodiversity are eliminated, phased out or reformed and positive incentives for the conservation and sustainable use of biodiversity are developed and applied.

TARGET 4: By 2020 investments in systems of production and consumption based on sustainable eco-friendly practices increased.

STRATEGIC GOAL B. Reduce the direct pressures on biodiversity and promote sustainable use

Six (6) targets have been identified for the realisation of this defined strategic goal.

TARGET 5: By 2020, the rate of degradation and fragmentation of ecosystems and the loss of habitats is significantly reduced

TARGET 6: By 2020, at least three Legislations that govern exploitation of aquatic and terrestrial resources are reviewed and enforced.

TARGET 7: By 2020, biodiversity and agriculture related policies, laws and strategies promote sustainable management of forest, agricultural and aquaculture ecosystems are reviewed and implemented.

TARGET 8: By 2020, all forms of pollution from water and land-based activities are brought to levels that are non-detrimental to biodiversity ecosystem functions.

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 prevent their introduction and establishment.

TARGET 10: By 2020, the multiple anthropogenic pressures on coral reef and vulnerable ecosystems impacted by climatic change are minimized.

STRATEGIC GOAL C. To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

Three (3) targets have been identified for the realisation of this defined strategic goal.
TARGET 11: By 2020, area covered under marine protected areas be increased from 6.5% to 10% and effectively manage the existing terrestrial and marine protected areas.

TARGET 12: By 2020, species that require special attention are identified and managed for long-term sustainability in biodiversity assessment.

TARGET 13: By 2020, strategies to reduce genetic erosion developed and implemented to maintained genetic diversity of cultivated plants, farmed and domesticated animals and their wild relatives.

STRATEGIC GOAL D. Enhance the benefits to all from biodiversity and ecosystem services

Three (3) targets have been identified for the realisation of this defined strategic goal.

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

TARGET 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks enhanced, through conservation and restoration, thereby contributing to climate change mitigation and adaptation and to combating desertification.

TARGET 16: By 2020, Fair and Equitable Sharing of Benefits arising from utilization of biodiversity resource is in force and operational, consistent with national and international legislation.

STRATEGIC GOAL E. Enhance implementation through participatory planning, knowledge management and capacity building

Four (4) targets have been identified for the realisation of this defined strategic goal.

TARGET 17: By 2016, Tanzania has adopted NBSAP as a policy instrument, and has commenced implementation with effective participation.

TARGET 18: By 2020, traditional knowledge, innovation and practices relevant for the conservation and sustainable use of biodiversity respected and safeguarded.

TARGET 19: By 2020, significant increase in the contribution of knowledge, technology and scientifically based information that are generated and shared.

TARGET 20: By 2020, financial resources in support of biodiversity programmes significantly increased.

It is within this framework that twenty (20) National Biodiversity Targets corresponding to the Aichi targets have been defined to ensure that by 2020 the five strategic goals will effectively be realized.

THE ACTION PLAN

The NBSAP action plan is presented as a road map to achieving the Aichi targets whilst prioritizing and setting timelines with responsible parties for each action. The action plan sets the time required to realize the action, performance and verifiable indicators and allocates responsibilities for implementation to different institutions that include Government MDAs, Local Government, Private sector, Research and Academic Institutions, NGOs and CBOs.

Effective and efficient implementation of NBSAP requires public participation and partnership with non-state actors, fostered through development and implementation of Sub-national (i.e. sector and local) Biodiversity Strategies and Action Plans (SBSAPs). For successful implementation of NBSAP it is imperative to build inclusive partnerships between State (relevant ministries, departments and agencies, local government authorities) and Non-State Actors (International and national NGOs, CSOs, Private Sector, etc.) during development and implementation of NBSAP.

Mainstreaming biodiversity conservation into sector policies, plans and programmes is a pre-requisite towards successful protection of biodiversity and achievement of the long-term vision of the country. Tanzania has so far made various efforts to conserve biodiversity by integrating it into various national, sector and cross-sector policies, plans and programmes. More effort is however required especially considering the regressive trends in biodiversity in the country. NBSAP 2015-2020, has considered this necessity, and it calls for formulation of new policies for new emerging policy issues and review of some policies, it also stresses on the need to strengthen implementation of the existing policies, plans and strategies.

NATIONAL BIODIVERSITY IMPLEMENTATION PLAN

The implementation plan of NBSAP 2015 focuses on capacity development, communication and outreach, resource mobilization, clearing house mechanism, monitoring and evaluation and implementation arrangement as important components of the implementation plan.

Capacity is required to implement the NBSAP and thus specific areas such as the clearinghouse mechanism, access and benefit sharing, economic valuation, genetic assessments, and development and implementation of sub-national BSAPs have been identified for address. To mainstream and complement existing measures, the EMA 2004 mechanism for communication and reporting will be used for issues related to NBSAP implementation. Public awareness will be done through educational platforms as well as through the use of mass media platforms. Effective implementation of NBSAP will largely depend on government subventions supported with contributions from the international community; private sector, individual contributions as well as revenue accrued from the payment of ecosystem services

The implementation mechanism gives the coordination responsibility to the Ministry responsible for Environment (VPO) under the guidance of CBD Focal Point. This NBSAP proposes establishment of an administrative mechanism to support the focal point and ensure adequate coordination in decision-making and planning amongst ministries, government agencies, local authorities, non-state actors and the public at large. Two committees, National Biodiversity Steering Committee (NBSC) and the National Biodiversity Technical Committee (NBTC) are proposed.

In recognition of the value of information sharing for planning and decision-making purposes, and in fulfilment of its obligation as a party to CBD, establishment of national Clearing-House Mechanism has been set as one of the priorities in this NBSAP. Regular monitoring and evaluation of the implementation of NBSAP is essential.

The monitoring and evaluation will ensure that national objectives and international obligations are met. Sectors will prepare and present periodic reports of their monitory activities to the central coordinating unit at VPO. Measuring progress on the implementation plan will be based on the various priority actions, performance indicators and verifiable indicators and timeframe for each target as per the Action Plan. It is expected that the monitoring process will generate progress reports, which will later feed into the evaluation process, which will ultimately establish a basis for further planning and revision of the NBSAP.

CHAPTER ONE

INTRODUCTION

1.1 The Value of Biodiversity to Tanzania

Tanzania is one of twelve mega-diverse countries in the world. It is among the top five in Africa harbouring more than one-third of the total plant species and twenty percent of the continent's large mammal population. Tanzania ranks 12th globally with regards numbers of bird species. The Biodiversity wealth renders significant socio-cultural, economic and environmental service to the country.

Tanzania's wildlife is the fourth richest and most diversified in Africa. Notably, the country is custodian of World Heritage Sites namely: Selous Game Reserve, Ngorongoro Conservation Area, Serengeti National Park, Kilimanjaro National Park and three Biosphere Reserves i.e. East Usambara, Lake Manyara, and the Ngorongoro – Serengeti (URT, 2014a,b). The Protected Areas network is endowed with different species of mammals, birds, amphibians and reptiles, which has a significant contribution in provision of food security, income to communities and revenue to the government. In 2013, the Ngorongoro Conservation Authority collected about TZS 47 billion from 507, 984 tourists, while the Tanzania National Parks Authority (TANAPA) collected revenues of TZS 105 billion from 750,977 tourists in the same year.

Tourism sector provides on aesthetic value and sport. Although not an explicitly independent sector in the national accounts, its contribution is inherently captured in other sectors through earnings from hunting, and in the services sector through earnings by hotels and restaurants, transport and communication, and financial services (TTS, 2001). Tourism is an important industry for job creation, foreign currency generation and poverty alleviation (MNRT, 1999). It is one of the fastest growing industries in Tanzania, with annual earnings amounting to USD 1,712.7 million in 2012, which is an increase of about 26 per cent from USD 1,353.2 million recorded in 2011.

Forestry renders consumptive, productive and non-consumptive values of biodiversity. It contributes 4.6% of the nation's GDP (NBS, 2014), employing about 800,000 people. It is a source of fodder for livestock and supports the development of other sectors such as agriculture and tourism. The country is yet to benefit from the consumptive use of non-wood forest products (NWFPs) such as medicinal plants and animals that host genetic information with the potential to transform livelihoods of communities, and contribute to a green economy. Forests alone contribute over 90% of energy (both firewood and charcoal) consumption (URT, 2014a), with the highest percentage of charcoal being consumed in the urban centers such as the city of Dar es Salaam. Furthermore, forests also offer ecosystem services as water catchment areas, carbon sinks, and biodiversity protection (URT, 2014a). Tanzania hosts significant forest cover that is productively exploited for direct use in furniture, energy, textile and leather industries.

The livestock sector also renders consumptive and productive use, value of biodiversity contributing 4.6% in 2012 and 4.4% in 2013 to the national GDP. With a

density of animals amounting to 22.8 million cattle, 15.6 million goats, 7 million sheep, 2 million pigs and 60 million chickens, Tanzania registers third on the continent. Livestock occupies about 26 million ha of Tanzanian land, out of the 50 million ha of land classified as suitable for production.

Agriculture is the largest employer engaging approximately 70% of the total population contributing 24.5% of the GDP (NBS, 2014). Forty four (44) million hectares, (equivalent to 46%) of Tanzania's land are classified as suitable for agriculture (URT, 2012c), however, to-date only about 10 million hectares (equivalent to 23% of suitable land) is under cultivation (URT, 2009).

Tanzania is endowed with marine and inland aquatic resources including a coastline of 1,424 km stretching from Tanga in the north to Mtwara on the south side including islands, 64,000 km^2 of territorial waters, 223,000 km^2 of Exclusive Economic Zone (EEZ), 54,277 km^2 of large freshwater lakes (Victoria, Tanganyika and Nyasa), medium and small lakes, various rivers and wetlands that is considerably rich in fisheries resources. The sector employs more than 4 million people and its contribution to the GDP in 2012 and 2013 was 1.4%. Fisheries provide 30% of the national total animal protein intake (URT, 2010a), and is a source of foreign exchange and supports recreation as well as the tourism industry.

Tanzania is home to over 220 tribes with diverse cultural practices, customs, religion and psycho-spiritual aspects. Biodiversity, in particular plants are considered sacred by some communities and hold a distinct social value. Tanzania is an ethical and conscious society and thus conservation of species and ecosystems for purposes of healthy and productive environment is embedded in the countries vision 2025.

1.2 Biodiversity Conservation Initiatives

Tanzania has undertaken various measures to ensure sustainable conservation demonstrated by the signing Convention of Biological Diversity (CBD) on 12th June 1992 and ratifying of the same on 1st March 1996; Development and implementation of the 2001 National Biodiversity Strategy and Action Plan (NBSAP) (URT, 2001); Development and implementation of National strategies such as:- Climate Change (2012); Strategy on Urgent Actions on Land degradation and Water Catchments (2006); Strategy on Urgent Actions for the Conservation of Marine and Coastal Environment, Lakes, Rivers and Dams (2008); and Development of National Environmental and Action Plan (2013-2018) and other Strategies aimed at pollution control. In addition to that, formulation of different Acts, Regulations and Policies has led to among other things, development and implementation of Programmes and Projects, strengthening and establishment of Institutions and Agencies to manage biodiversity such as the Tanzania Forest Services Agency (TFS); Institutions to conduct research which include, Tanzania Fisheries Research Institute (TAFIRI), Tanzania Wildlife Research Institute (TAWIRI), Tanzania Forestry Research Institute (TAFORI) and several Agricultural Research Institutes (ARIs); Long term monitoring initiatives such as the National Forest Resources Monitoring and Assessment (NAFORMA) Programme; educational programmes like the "Malihai clubs"(1,687) in primary and secondary schools as well as Beach Management Units (BMUs).

National level interventions are carried out in tandem with and or complement to regional and international obligations as Tanzania implements several multilateral agreements for protection of biodiversity.

1.3 Rationale

NBSAP preparation and implementation is a requirement to Parties as per Article 6 of the CBD and Tanzania prepared its first NBSAP in 2001. However, since then a number of issues such as climate change and variability, invasive species, GMOs, synthetic biology, biofuel development, mining, oil and gas exploration, green and blue economy have emerged that necessitate review of the 2001 NBSAP. Furthermore obligations of CBD member countries to address and implement the Strategic Plan for Biodiversity 2011-2020 and achievement of 2020 Aichi Biodiversity Targets warrant a revised NBSAP to be developed for Tanzania.

NBSAPs provide countries with coordinated holistic road maps that ensure national and international obligations are met whilst delivering socio-economic and cultural gains from biodiversity.

The NBSAP (2015-2020) is developed in line with the national development vision 2025 articulation on the importance of biodiversity, i.e. to build a society that values Biodiversity richness, using it sustainably and equitably, while taking responsibility for actions that meet both the competing requirements of the present and the legitimate claims of the future generations.

1.4 Scope and Objectives of the NBSAP

1.4.1 Scope of the NBSAP

The NBSAP emphasises biodiversity conservation from ecosystem, species to genetic diversity, highlighting strategies to assess and mitigate trends and threats as linked to development and poverty alleviation. The aim is to set strategic goals and targets for a five year period till 2020 that take into consideration a multi-sectoral approach in implementation.

In ensuring compliance with national commitments to global conventions, the scope of the NBSAP goes beyond the borders of Tanzania and the text of the CBD as it seeks to ensure synergy with other national and Multilateral Environment Agreements, and Strategies like the National Strategy for Growth and Poverty Reduction (NSGPR), National Environmental Action Plan (NEAP), National Action Programme to Combat Desertification (NAP), National Adaptation Programme of Action (NAPA).

1.4.2 Objectives of the NBSAP

The overall objective of the NBSAP is to reduce loss of biodiversity, promote the value of biodiversity and improve community livelihoods. Specifically this NBSAP is set to:

i) Mainstream biodiversity conservation and sustainable use in national development plans, policies, programmes and across sectors;

ii) Ensure multi-stakeholder involvement in planning, implementation and management of biodiversity;
iii) Ensure sustainable use of biodiversity through strengthened knowledge, awareness raising, support to scientific research and innovations;
iv) Protect and rehabilitation of degraded biomes and threatened species to reduce the rate of habitat loss and genetic erosion;
v) Ensure equitable access and benefit sharing of biodiversity whilst safeguarding traditional knowledge to benefit biodiversity conservation;
vi) Promote effective response measures against natural and anthropogenic threats to biodiversity;
vii) Promote economic valuation for biodiversity and payments for ecosystem services; and
viii) Ensure sustainable biodiversity financing mechanisms.

1.5 Preparation Process of the Revised NBSAP

The process for the development of this NBSAP followed a consultative path as recommended by the NBSAP forum. Notably not all the phases are included in the NBSAP document as these are to be developed as action plans by the next level of implementation parties. The scheme below (**Figure 1-1**) is indicative of the process though this document focuses on the first five phases and gives direction for the last three, which are implementation, planning, monitoring and evaluation.

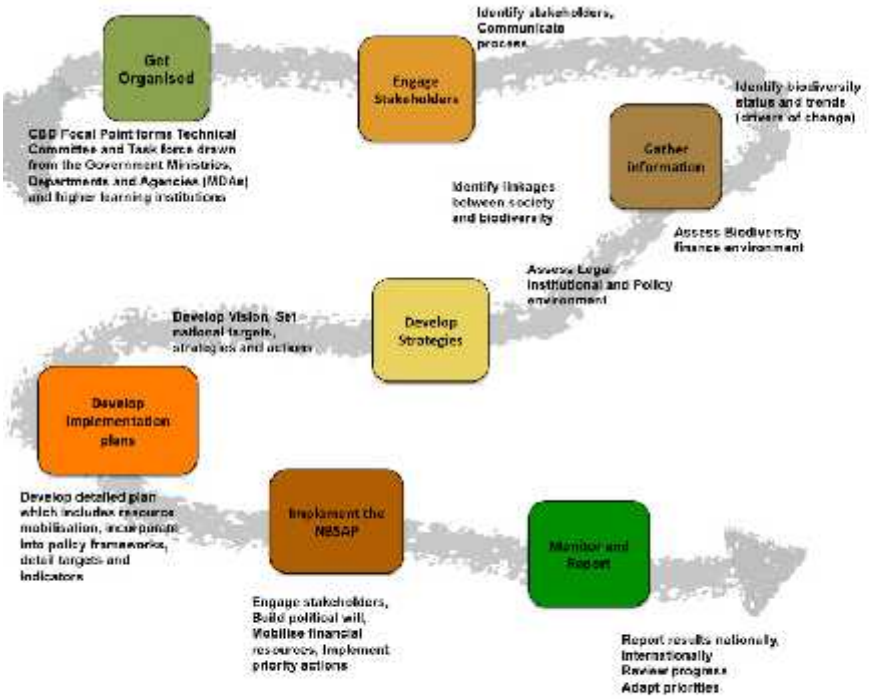

Figure 1-1: The NBSAP process
(*Adapted from the NBSAP forum)*

1.6 Structure of the NBSAP 2015 - 2020

The NBSAP has eight (8) chapters.

Chapter one highlights the value of biodiversity and draws rationale for the current document.

Chapter two gives a brief country profile in terms of location, climate and physical features.

Chapter three presents an overview of the current status and trends at ecosystem, species and genetic levels, major programmes and financing mechanisms. It also provides an analysis of the challenges of the 2001 NBSAP and sets direction for the strategies and targets presented in chapter six.

Chapter four gives an overview of the natural and anthropogenic causes of biodiversity loss and consequences of biodiversity loss to the ecological environment and to the human well-being.

Chapter five draws reference to the policy, legal and institutional framework governing conservation and the financing mechanisms that support interventions in relation to socio-economic development.

Chapter six presents the roadmap of the NBSAP 2015-2020 outlining the vision, mission statement, guiding principles, goals and targets needed to reverse current trends. The NBSAP 2015-2020 aligns to the five strategic Aichi goals and 20 achievable and measurable targets drawn up in line with the Aichi targets and 2011-2020 Biodiversity targets.

Chapter seven is the heart of the NBSAP 2015-2020 detailing the action plan set to achieve the targets with milestones.

Chapter eight elaborates the administration and oversight of the NBSAP 2015-2020 with the implementation plan. The plan provides mechanisms for effective implementation of the strategy including resource mobilization and development, capacity development, information sharing and dissemination, communication, monitoring and evaluation, and reporting.

CHAPTER TWO

LOCATION, CLIMATE AND PHYSICAL FEATURES

2.1 Location

Tanzania is located in Eastern Africa, between Latitude 1º and 12º South and Longitude 29º and 41º east. It is bordered by Kenya and Uganda to the North; Rwanda, Burundi and Democratic Republic of Congo to the West; Zambia and Malawi to the South West; Mozambique to the South; and Indian Ocean to the East (Figure 2-1). The United Republic of Tanzania (URT) consists of Tanzania Mainland and Zanzibar with a total area of 945,087 $km^{2.}$ Out of this 883,749 km^2 (881,289 km^2 is for Tanzania mainland and 2,460km^2 is for Zanzibar) comprise the terrestrial land area and 59,050 km^2 comprise the inland water bodies and part of the Exclusive Economic Zone (EEZ) of the Indian Ocean that is approximately 0.204 Million Km^2 (Somoilys *et al.*, 2015).

Figure 2-1: The map of Tanzania showing regional and international boundaries

2.2 Climate

The climate in the country is diverse as a result of location, wide altitudinal range that governs temperature, proximity to the ocean and presence of large inland lakes.

Temperature

The country experiences temperature ranges that vary according to geographical location, relief and altitude. The coast has average temperatures between 27°C and 29°C, while the central, northern and western parts temperatures range between 20°C and 30°C. Temperatures are higher between the months of December and March and lower during the months of June and July. In the Southern highlands and mountainous areas of the north and northeast, temperature occasionally drops below 15°C at night (URT, 2014b), and in the cold months in June and July sub-zero temperatures can also be experienced.

Rainfall

Tanzania has two rainy seasons, long rains (*Masika* in Kiswahili) that begin mid of March and end at the end of May, and the short rains (*Vuli* in Kiswahili) which begin in the middle of October and continue to early December which are associated with the southward and northwards movement of the Inter-Tropical Convergence Zone. The northern part of the country including areas around Lake Victoria Basin, North-Eastern Highlands and the Northern Coast experience a bimodal rainfall regime, whilst the Central, South and Western areas have a prolonged unimodal rainfall regime starting from November, continuing to the end of April. Generally, annual rainfall varies from 550 mm in the central part of the country up to 3,690 mm in some parts of south-western highlands (Chang'a *et al*., 2010). Most of the country receives less than 1,000 mm, except the highlands and parts of the extreme south and west ,where 1,400 to 2,000 mm can be expected. Average rainfall in the central regions is around 600 mm.

Winds

The climate of Tanzania is influenced by the monsoon winds, the southerly monsoons and the northerly monsoons. The southerly monsoons begin in April, ending in September. They are usually strong and predominantly southerly, characterised with lower temperatures (approximately 25°C) and bring the long rains. The northerly monsoons begin in November ending in February. These are lighter winds and predominantly northerly. The northerly monsoon are characterised with high air temperatures (>30°C) and bring short rains.

Humidity

The mean relative humidity in Tanzania for an average year is recorded as 44.6% and on a monthly basis ranges from 30% in September and October, to 58% in March. The coastal areas are more humid as compared to the rest of the country.

2.3 Physical Features

Tanzania is comprised of five major landscapes:

i) *Coastal Plains* that extend along the coastline of Tanzania Mainland for about 800 km long from the border with Kenya in the north, to the border with Mozambique in the South.

ii) *Plateaux* in the central area of the country (includes the national capital, Dodoma), and is part of the East African Plateau that ranges between 1,000 and 1,500 meters above sea level (m.a.s.l.).

iii) *Highlands and mountains* that include the Usambara and Pare Mountain ranges, widely known as the Eastern Arc Mountains; Southern Highlands, which include Livingstone, Kipengere, Udzungwa and Uluguru mountain ranges; Mt. Meru (4,565 m.a.s.l.) and Mt. Kilimanjaro (5,895 m.a.s.l.) the highest point in Africa.

iv) *River and lake basins* made of nine drainage water basins (Pangani, Wami/Ruvu, Rufiji, Ruvuma and the Southern Coast, Lake Nyasa, the Internal Drainage Basins of Lake Eyasi, Manyara and Bubu depression, Lake Rukwa, Lake Victoria and Lake Tanganyika. The main rivers are the Pangani, Rufiji, Wami, Ruaha, Ruhudji, Ruvu and Ruvuma.

v) *The Great East African Rift Valley* composed of two branches namely; the eastern branch that runs eastward through central Tanzania and include Lake Natron, Manyara and Eyasi; and the western branch that includes Lake Nyasa, Rukwa and Tanganyika.

Other spectacular physical features of the country include diverse vegetation types such as extensive savannah and bushy vegetation that are fringed by narrow belts of forested highlands, the Itigi thickets, the Masai steppes, the miombo woodlands and the mangrove forests along the coast. These ecosystems are famous habitats for diverse types of wildlife.

2.4 Agro-climatic Zones

Based on altitude, precipitation and temperature pattern, dependable growing seasons and average water holding capacity of the soils and physiographic features, Tanzania has been divided into seven agro-climatic zones as presented in (**Table 2-1**).

Table 2-1: Tanzania Agro-climatic zones

Zone	Sub-Zone and areas	Soils and Topography	Altitude (m)	Rainfall (mm/yr)	Growing season
COAST	North: Tanga (except Lushoto), Coast and Dar-es- Salaam.	Infertile sands on gently rolling uplands, Alluvial soils in Rufiji, sand and infertile soils.	Under 3000	North: Bimodal, 750-1200mm	October-December and March-June
	South: Eastern Lindi and Mtwara (except Makonde Plateau).	Fertile clays on uplands and river flood plains.		South: unimodal, 800-1200mm	December-April
ARID LANDS	North: Serengeti, Ngorongoro Parks, Part of Masai land.	North: Volcanic ash and sediments. Soils variable in texture and very susceptible to water erosion.	1300-1800	North: unimodal, unreliable, 500-600mm	March- May
	Masai Steppe, Tarangire Park, Mkomazi Reserve, Pangani and Eastern Dodoma.	South: Rolling plains of low fertility. Susceptible to water erosion. Pangani river flood plain with saline, alkaline soil.	500-1500	South: unimodal and unreliable, 400-600mm	
SEMI-ARID LANDS	Central Dodoma, Singida, Northern Iringa, some part of Arusha, Shinyanga.	Central: Undulating plains with rocky hills and low scarps. Well drained soils with low fertility. Alluvial hardpan and saline soils in Eastern Rift Valley and lake Eyasi. Black cracking soils in Shinyanga.	1000-1500	Central: unimodal and unreliable: 500-800mm	December - March
	Southern: Morogoro (except Kilombero and Wami Basins and Uluguru Mts).Also Lindi and Southwest Mtwara.	Southern: Flat or undulating plains with rocky hills, moderate fertile loams and clays in South (Morogoro), infertile sand soils in centre of Morogoro	200-600	South-eastern: unimodal 600-800mm	
PLATEAUX	Western: Tabora, Rukwa (North and Centre), Mbeya.	Western: Wide sandy plains and Rift Valley scarps.	800-1500	Western: unimodal, 800-1000mm	November-April
	North: Kigoma, and Part of Mara.	Flooded swamps of Malagarasi and Ugalla rivers, have clay soil with high fertility.	1,500-1,700		
	Southern: Ruvuma and Southern Morogoro.	Southern: upland plains with rock hills. Clay soils of low to moderate fertility in south, infertile sands in North.	500-2,000	Southern: unimodal, very reliable, 900-1300mm	

Zone	Sub-Zone and areas	Soils and Topography	Altitude (m)	Rainfall (mm/yr)	Growing season
SOUTHERN AND WESTERN HIGHLANDS	Southern: A broad ridge of N. Morogoro to N. Lake Nyasa, covering part of Iringa and Mbeya.	Southern: Undulating plains to dissected hills and mountains. Moderately fertile clay soils with volcanic soils in Mbeya.	1200-1500	unimodal, reliable, local rain shadows, 800-1400	December – April
	South-western: Ufipa plateau in Sumbawanga	South-western: Undulating plateau above Rift Valleys and sand soils of low fertility.	1400-2300	unimodal, reliable, 800-1000	November-April
	Western: Along the shore of Lake Tanganyika in Kigoma and Kagera.	Western: North-south ridges separated by swampy valleys, loam and clay soils of low fertility in hills, with alluvium and ponded clays in the valleys.	100-1800	Bimodal, 1000-2000	October-December and February-May
NOTHERN HIGHLANDS	Northern: foot of Mt. Kilimanjaro and Mt. Meru. Eastern Rift Valley to Eyasi.	Northern: Volcanic uplands, volcanic soils from lavas and ash. Deep fertile loams. Soils in dry areas prone to water erosion.	1,000-2,500	Bimodal, varies widely 1000-2000	November-January and March-June
	Granite Mts Uluguru in Morogoro, Pare Mts in Kilimanjaro and Usambara Mts in Tanga, Tarime highlands in Mara.	Granite steep Mountain side to highland plateaux. Soils are deep, arable and moderately fertile on upper slopes, shallow and stony on steep slopes.	1,000-2,000	Bimodal and very reliable 1000-2000	October-December and March-June
ALLUVIAL PLAINS	Kilombero (Morogoro)	Cental clay plain with alluvial fans east and west.	750-1200	unimodal, very reliable, 900-1300	November-April
	Rufiji (Coast)	Wide mangrove swamp delta, alluvial soils, sandy upstream, loamy down steam in floodplain	<500	unimodal, often inadequate 800-1200	December-April
	Usangu (Mbeya)	Seasonally flooded clay soils in North, alluvial fans in South	2,400-5,000	unimodal, 500-800	December-March
	Wami (Morogoro)	Moderately alkaline black soils in East, alluvial fans with well drained black loam in West	400-1,000	unimodal, 600-1800	December-March

(Source: Adopted from ARI Mlingano, 2015)

CHAPTER THREE

BIODIVERSITY STATUS AND TRENDS

Tanzania's mega-biodiversity is distributed over ecosystems, species and genetic resources both in protected and non-protected areas. These areas are subject to anthropogenic and environmental impacts that require regular monitoring for devising appropriate strategies to ensure conservation and sustainable use.

3.1 Ecosystem Status

The natural ecosystems in Tanzania are broadly divided into three categories, namely: Terrestrial ecosystems, coastal and marine ecosystems, and inland water (lakes, rivers, dams and wetlands) ecosystems.

3.1.1 Terrestrial ecosystems

Terrestrial ecosystems include forests, mountains, drylands, savannah and agricultural lands. Tanzania's forest cover is about 48 million hectares (about 55% of the total land area) with woodlands being the most common, occupying about 51% of the total land area equivalent to 93% of the forest area (**Figure 3-1**). The remaining 7% is composed of lowland forests, humid montane forest, mangrove forests and plantations (URT, 2014a). The estimated total volume of trees is 3,100 million m^3, of which 97% comes from trees of natural origin, and only 3% from planted trees. Almost half of the total volume is found in protected areas, and therefore not legally accessible for extraction. Most of the un-gazetted forest and woodland resources are found in village land, coastal forests and associated habitats and miombo woodlands (URT, 2014b).

The main forest habitat types include:

i) The moist forest mosaic (L. Victoria Phytochorion of the L. Victoria basin),

ii) Coastal forest and thicket remnants of the Zanzibar-Inhambane section of the Guinea-Congolian phytogeographical region (White, 1983) are found from the foot of the Eastern Arc Mountains to the Indian Ocean shores, and in the offshore Islands of Pemba, Zanzibar and Mafia,

iii) Afro-montane forest - which occurs at altitudes from about 2000 m.a.s.l and is estimated to cover about 2 million ha of land, such as the Eastern Arc Mountains (EAMs), which is one of 25 global biodiversity 'Hotspots'. Other montane forests are on Mt Kilimanjaro, Mt Meru, Ngorongoro, Rungwe, Hanang, Mahenge and Matengo highlands, Mahale Mountains and Ufipa Plateau. Mt Kilimanjaro's large altitudinal range (700-5,895 m) supports rich biodiversity ranging from savannah bushland, grassland, pastureland and cropland in the low-lying areas, indigenous forest at mid-altitudes, and alpine vegetation on the higher slopes

iv) Acacia savannah grassland (mostly in the dry and semi-arid northern parts of Tanzania),

v) *Acacia* - *Commiphora* thorn bush, and

vi) *Brachystegia* - *Julbernardia* savannah (Zambezian and the Guinea-Congolean Zone).

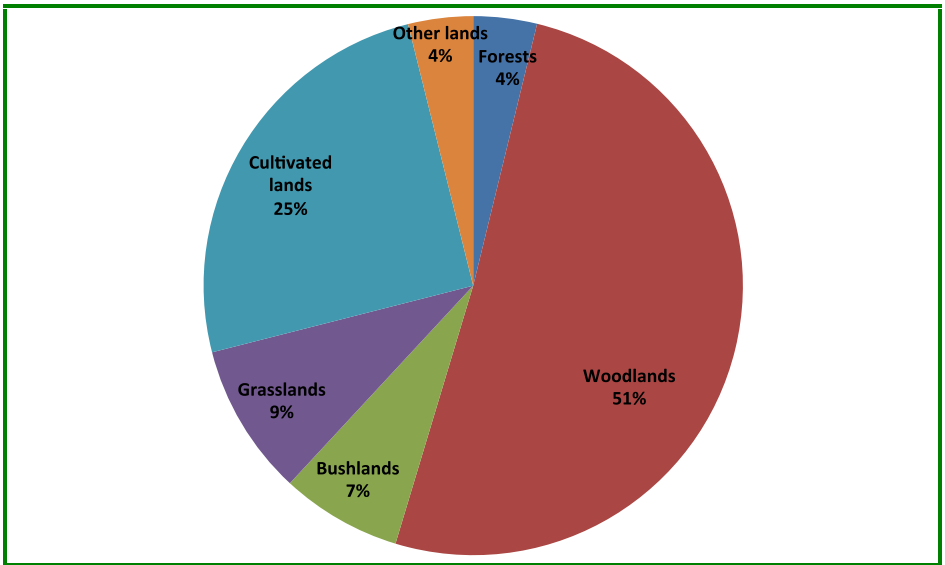

Figure 3-1: Proportion of different land covers in Tanzania (*NAFORMA, 2015*)

In addition to the forested area, Tanzania is endowed with about 44 million hectares of arable land, which only 24% is under crop production (URT, 2014a). It is estimated that about 80% of the cultivated land consists of traditional subsistence farming systems in which there is considerable diversity of crops and species grown and sizeable variety in the ways in which they are grown. The most favourable conditions for agricultural biodiversity is considered to occur under extensive and/or traditional agricultural management.

3.1.2 Coastal and marine ecosystems

Tanzania's coastal and marine ecosystems occupy an area of about 241,500 km^2 (about 20% of total land area of the country). Coastal and marine ecosystems include coastal forests, mangroves, coral reefs, seagrass beds, sandy beaches, rocky shores and numerous islets. All mangroves areas are gazetted, covering 115,500 hectares on Tanzania mainland and 18000 hectares on Zanzibar. Coral reefs present one of the most productive and biologically diverse marine ecosystems (**Plate 3-1**) hosting over 500 species of fish and other invertebrates, making them an important fisheries resource supporting about 90% of artisanal marine fisheries covering about 3,580 km^2. The extent of seagrass beds and the relative species densities are yet to be established. Notably, coastal and marine ecosystems of Tanzania are characterised by

numerous rocky shores that offer stable substrata for luxurious growth of algae. Proliferation of some green algae e.g. *Ulva* is sometimes considered an indication of nutrient pollution in the area. Ocean Road beach in Dar es Salaam and Malindi in Zanzibar provide good examples of this phenomenon.



Plate 3-1: Coral reef *(left)*, Mangroves *(centre)* and Seagrasses *(right)*

3.1.3 Freshwater Ecosystems

Tanzania is endowed with considerable freshwater resources that include lakes, rivers, springs, natural ponds, underground sources, man-made reservoirs and wetlands. Lakes cover about 6% of the land area and include the great lakes (Lake Victoria, Lake Tanganyika and Lake Nyasa) that are transboundary. Other lakes include Lake Rukwa and a chain of Rift valley lakes (Lakes Natron, Eyasi and Manyara). These lakes harbour high endemism in terms of fishes and are a key mode of livelihood for the local communities.

There is a diverse network of permanent and seasonal rivers including Rufiji, Kilombero, Ruaha, Wami, Ruvuma, Mara, Kagera, Malagarasi and Pangani, their tributaries and associated small streams. With exception of a few rivers found within protected areas (e.g. those under protected montane forests and Ramsar sites), many rivers are not protected, and thus exposed to decreased ecological integrity as well disruption of ecosystem goods and services they provide.

Dams cover over 850 km^2 including Mtera (610 km^2), Nyumba ya Mungu (180 km^2), Hombolo (15.4 Km^2) and Kidatu (10 km^2). In addition to their importance in terms of hydropower production, they are source of water and fishing. These artificial impoundments serve as important wildlife habitat. Only Nyumba ya Mungu has the benefit of partial protection as a breeding site for certain fish and bird species.

Wetlands in Tanzania occupy about 88,300 km^2 roughly 10% of the total land area of Tanzania Mainland), 58% of which are lakes and swamps. Major wetlands are found along major river systems such as the Rufiji-Ruaha River system, the Malagarasi-Muyovosi system, Kilombero and Ihefu. Other important wetlands are the alkaline lakes and endorheic swamps, including the soda Lakes of Natron, Manyara, Burigi, Tarangire, Bahi and Yaida swamps. Tanzania's wetlands harbour over 650 species including

molluscs, crustaceans and fish. Four of these wetlands namely Malagarasi/Muyovozi, Lake Natron Basin, Kilombero valley floodplain and Rufiji-Mafia-Kilwa are listed as Ramsar sites.

3.2 Species Diversity

3.2.1 Overall species diversity

The *Checklist of Tanzanian Species* lists a total of 14,336 species of protozoans, fungi, algae, plants, invertebrates and vertebrate animals with some exception (**Figure 3-2**) (Gideon *et al*., 2012). More than 25% of all plant species are used as wild-harvested medicinal plants (Nahashon, 2013). In addition to the checklist, the Tanzania Biodiversity Information Facility (TanBIF)[1] hosted at the Tanzania Commission for Science and Technology (COSTECH) avails species occurrence data over the Internet.

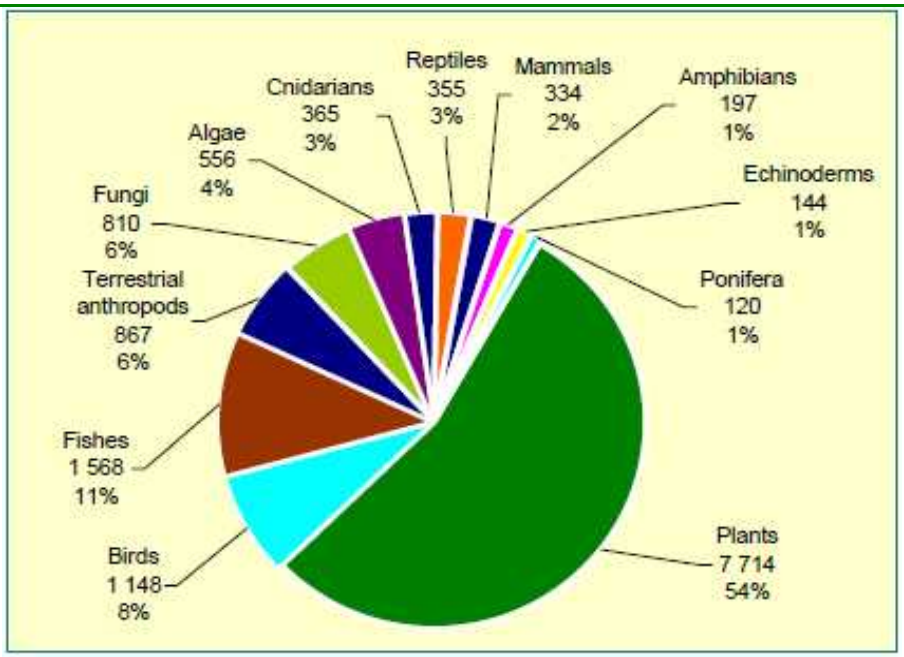

Figure 3-2: Number and proportions of some of the known and confirmed species for major taxonomic groups in Tanzania *(URT, 2014a)*

3.2.2 Endemic species

Tanzania exhibits a high degree of species endemism, which can be attributed to the complex topographical conditions and biological isolations in some areas resulting in unique microclimate and distinct ecological conditions that supports the many endemic species (URT, 2014a). **Figure 3-3** illustrates the proportion of endemism in select taxonomic groups. A list of some of the endemic species is presented in **Appendix 1**.

[1] TanBIF is a national node of the global biodiversity information facility (GBIF), which ensures open access of species occurrence data and information over the Internet.

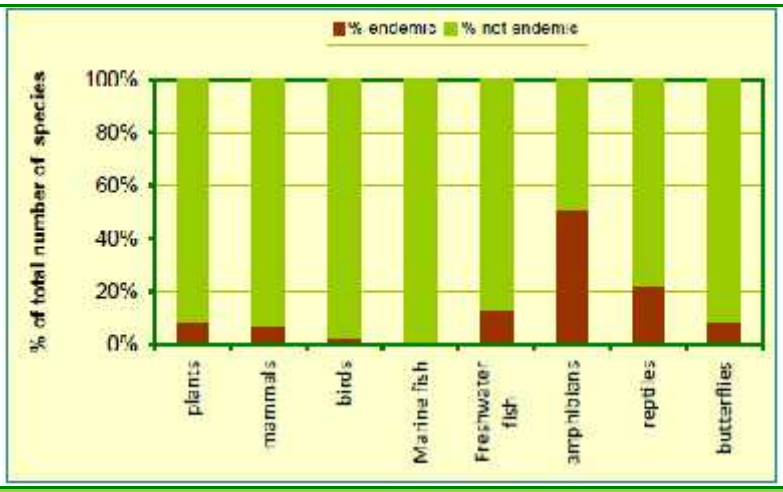

Figure 3-3: Proportion of endemic species for some of the major taxonomic groups *(URT, 2014a).*

3.2.3 Threatened and endangered species

The country ranks 15th globally with regard to the number of threatened species. According to the 2013 IUCN RedList, there are at least 900 threatened species recorded in the country of which several are endangered. Endangered species in Tanzania include: terrestrial animal species such as, Black rhinoceros, Wild dog, Chimpanzee, African elephant, Cheetah, Wattled crane; and Kihansi Spray toad; plant species such as *Pterocarpus angolensis* (Mninga), *Dalbergia melanoxylon* (Mpingo), *Uvariodendron gorgonis*, *Erythrina schliebenii* and *Karomia gigas* (**Plate 3-2**) and marine species such as coelacanth, dugongs and sea turtles (URT, 2014b).This high level of threatened species may be attributed to overexploitation, increased ecosystem-wide deterioration, habitat fragmentation and degradation, as well as climate change (URT, 2014a). **Figure 3-4** and **Figure 3-5** illustrate the proportion of threatened species in some of the taxa.

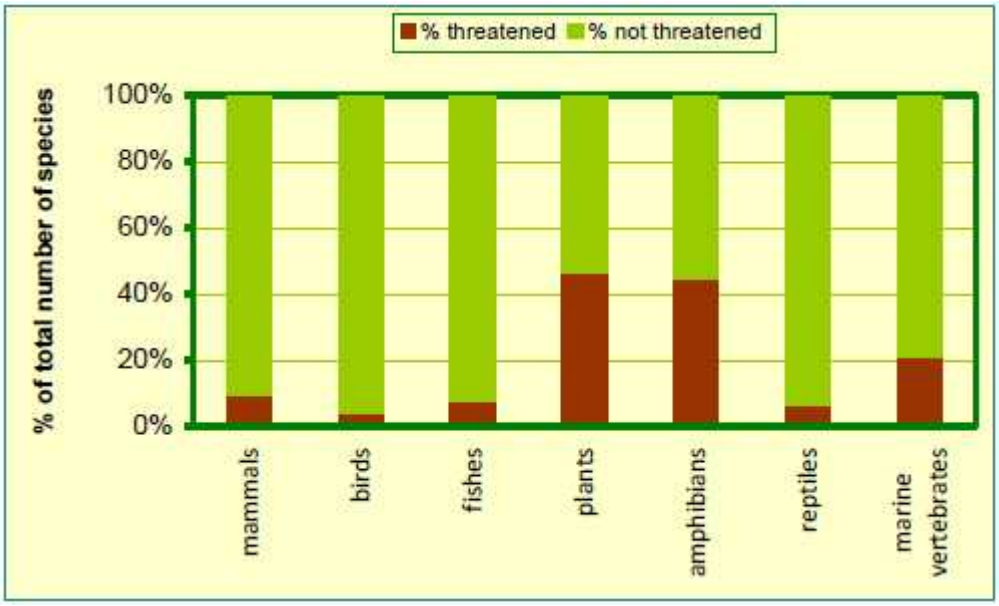

Figure 3-4: Proportion of threatened species for major taxonomic groups

(URT, 2014a)

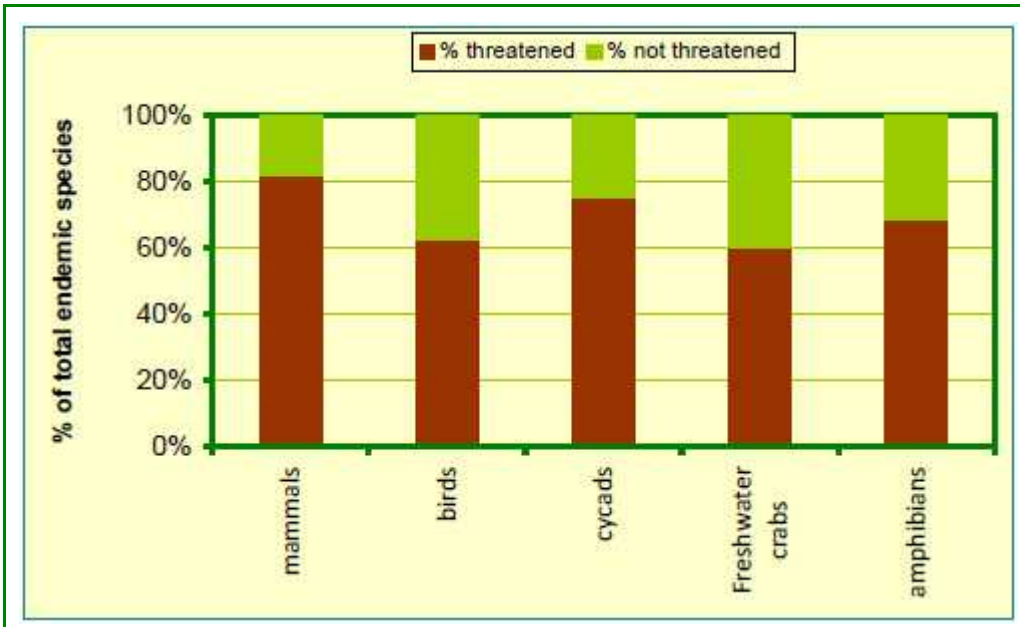

Figure 3-5: Proportion of threatened endemic species for major taxonomic groups

(URT, 2014a)

a) *Uvariodendron gorgonis*

b) *Erythrina schliebenii*

c) *Karomia gigas*

Plate 3-2: Some endangered plant species registered in IUCN Red list (*Courtesy C. Mligo*)

3.3 Genetic Diversity

There is limited information on the genetic diversity of about 14,366 species of plants, animals and microorganisms that have been recorded in Tanzania. This aspect of diversity has been investigated only for some crops (landraces and local cultivars) and a few domesticated animals (chicken and local cattle breeds). It is estimated that about 90% of the cultivated area of Tanzania is planted with local cultivars and landraces or farm-saved seeds of improved cultivars (URT, 2009). Landraces and traditional cultivars of all main crops hold a rich genetic diversity, which harbours an important gene pool for crop improvement. By 2009, a total of 215 improved cultivars mostly open and self-pollinating composites, hybrids and clones had been released (**Figure 3-6**).

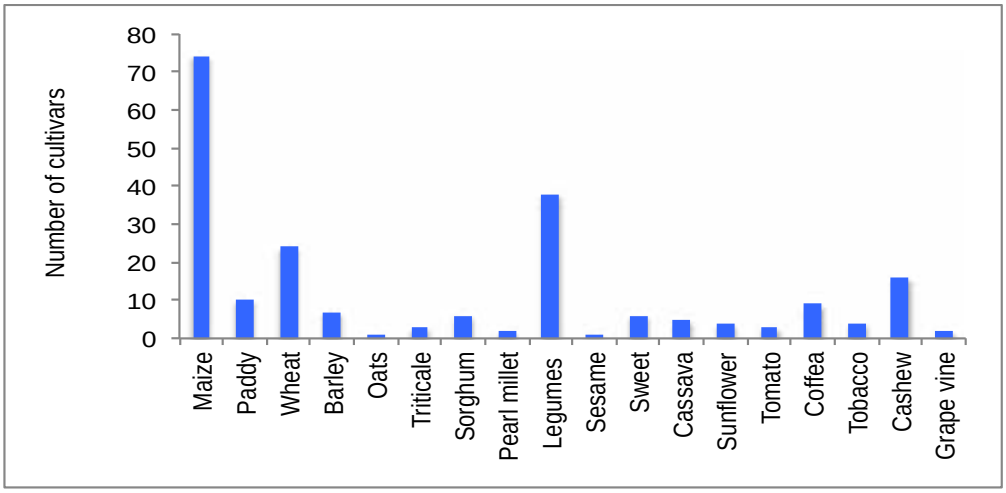

Figure 3-6: Number of improved cultivars for different crops (URT, 2009)

3.4 Protected Areas

3.4.1 Terrestrial Protected Areas

Tanzania has designated a large network of wildlife and forest protected areas covering 16 National Parks, 1 Conservation Area, 28 Game Reserves, 42 Game Controlled Areas, 38 Wildlife Management Areas and 4 Ramsar Sites, 109 Forest reserves (**Fig: 3-7a; 3-7b** and **Table 3-1**). Four Protected areas are inscribed into UNESCO's World Heritage Sites and three are Biosphere Reserves. The Biosphere Reserves are Lake Manyara, Ngorongoro - Serengeti and East Usambara. World Heritage Sites under the Nature category are: Serengeti National Park, Kilimanjaro National Park, Ngorongoro Conservation Area and Selous Game Reserve.

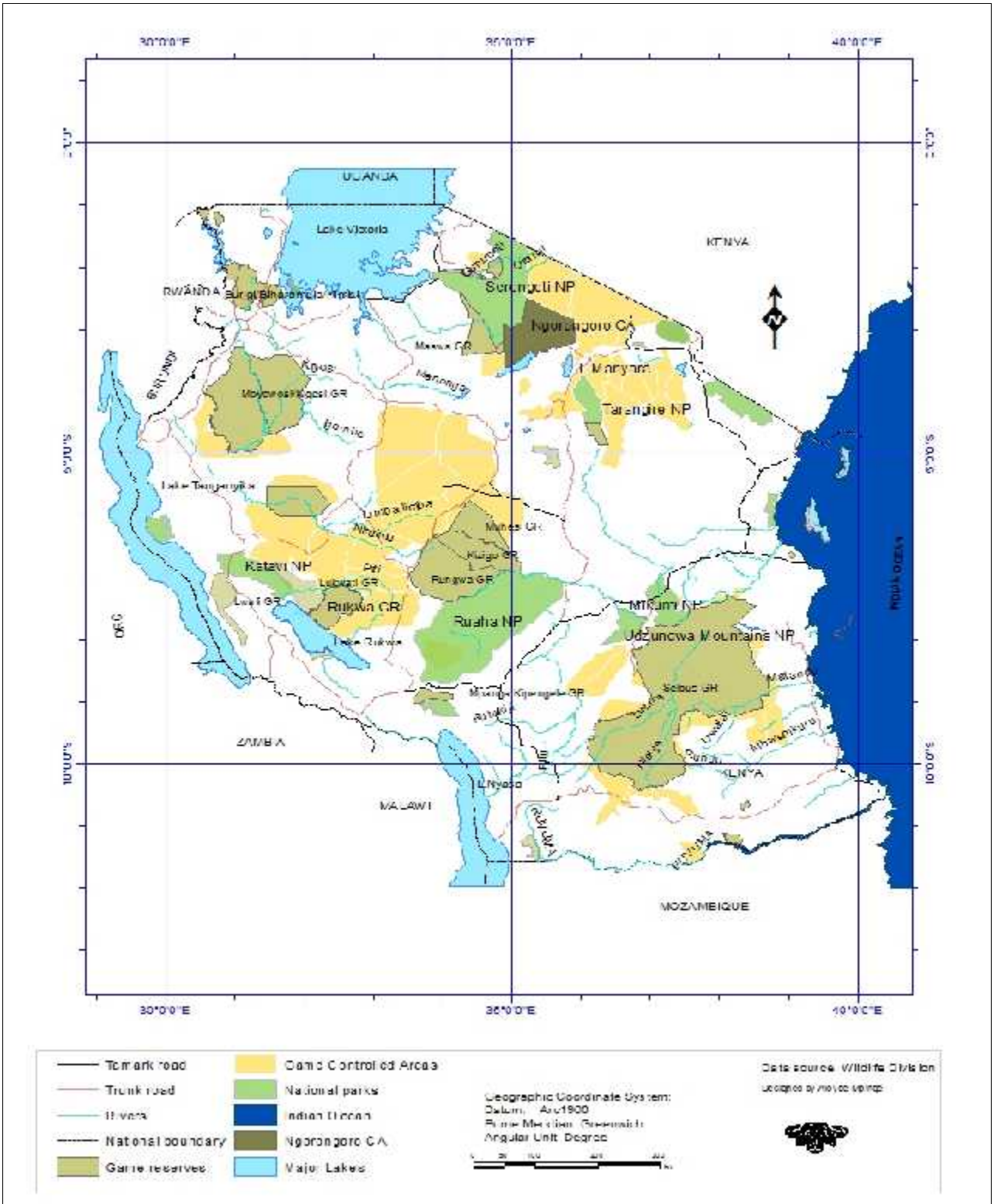

Figure 3-7a: Map of terrestrial Protected Area (URT, 2015)

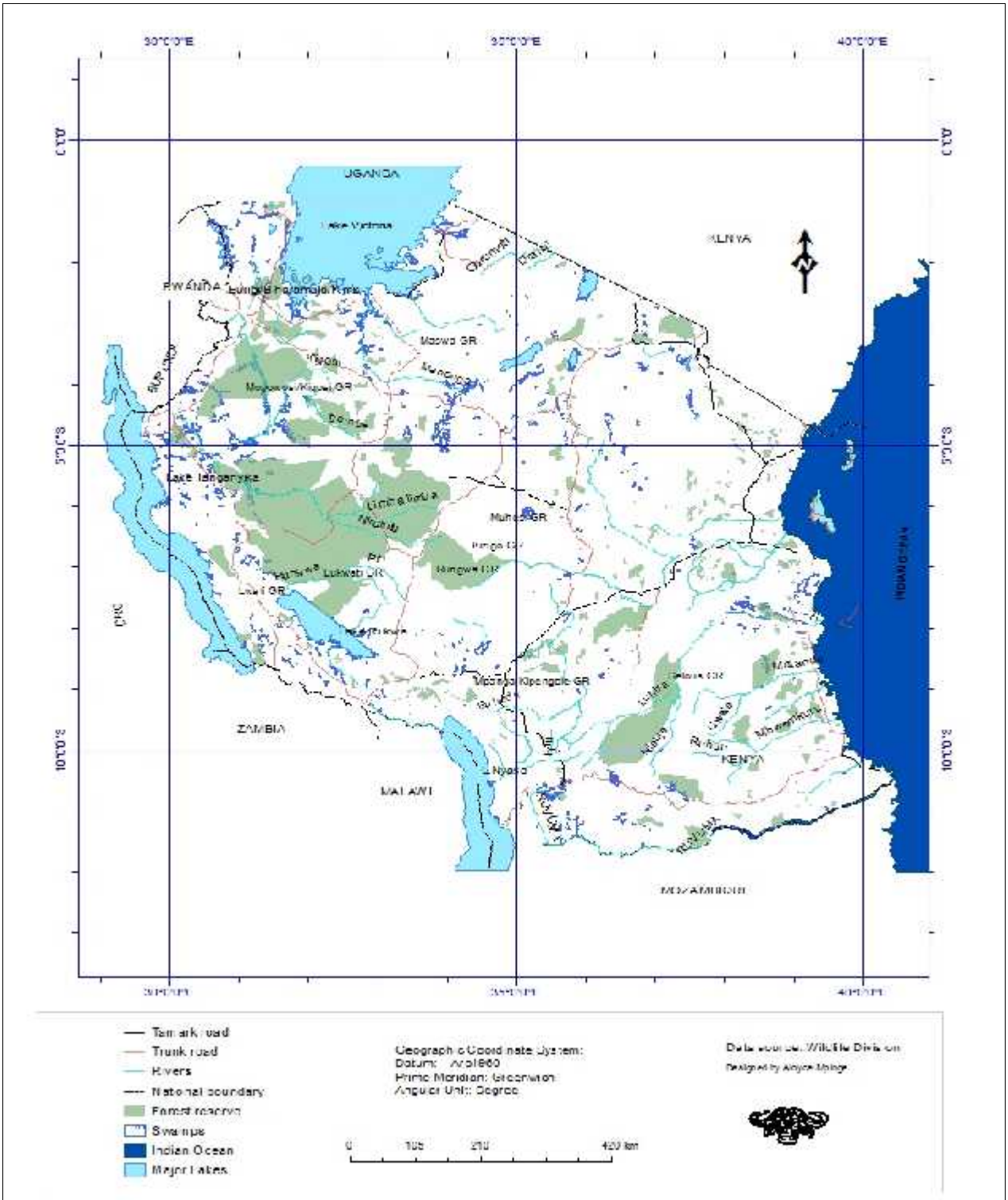

Figure 3-7b: Map of Terrestrial Protected Areas (URT, 2015)

Table 3-1: Categories of Wildlife and Forest Protected Areas

Category	Number	Area (km^2)	Percentage of Tanzania's total area
National Parks	16	57,365.05	6.07
Ngorongoro Conservation Area	1	8,292.00	0.89
Game Reserves	28	114,782.47	12.14
Game Controlled Areas	42	58,565.02	6.20
Wildlife Management Areas	38	29,518.40	3.12
Ramsar Sites	4	48,684.00	5.13
Forest reserves	109	414,599.30	46.8
Grand Total		**731,806.24**	**33.56**

(URT, 2014a and WB, 2011)




Plate 3-3: Some wildlife mammals in terrestrial protected areas

3.4.2 Marine Protected Areas

Tanzania has twenty one (21) Marine Protected Areas which include four (4) Marine Parks and seventeen (17) Marine Reserves (**Table 3-2**). Out of the 32,000 km^2 of the territorial sea of Tanzania Mainland only 2,173 km^2 (about 6.5%) has been gazetted as Marine Protected Areas (MPAs). The Protected Areas in Tanzania Mainland are: Mafia Island Marine Park (MIMP), Mnazi Bay and Ruvuma Estuary Marine Park (MBREMP) and Tanga Coelacanth Marine Park (TaCMP), and fifteen (15) Marine Reserves. In Zanzibar there is one (1) Marine Park and two (2) Marine Reserves (**Fig. 3-8**).

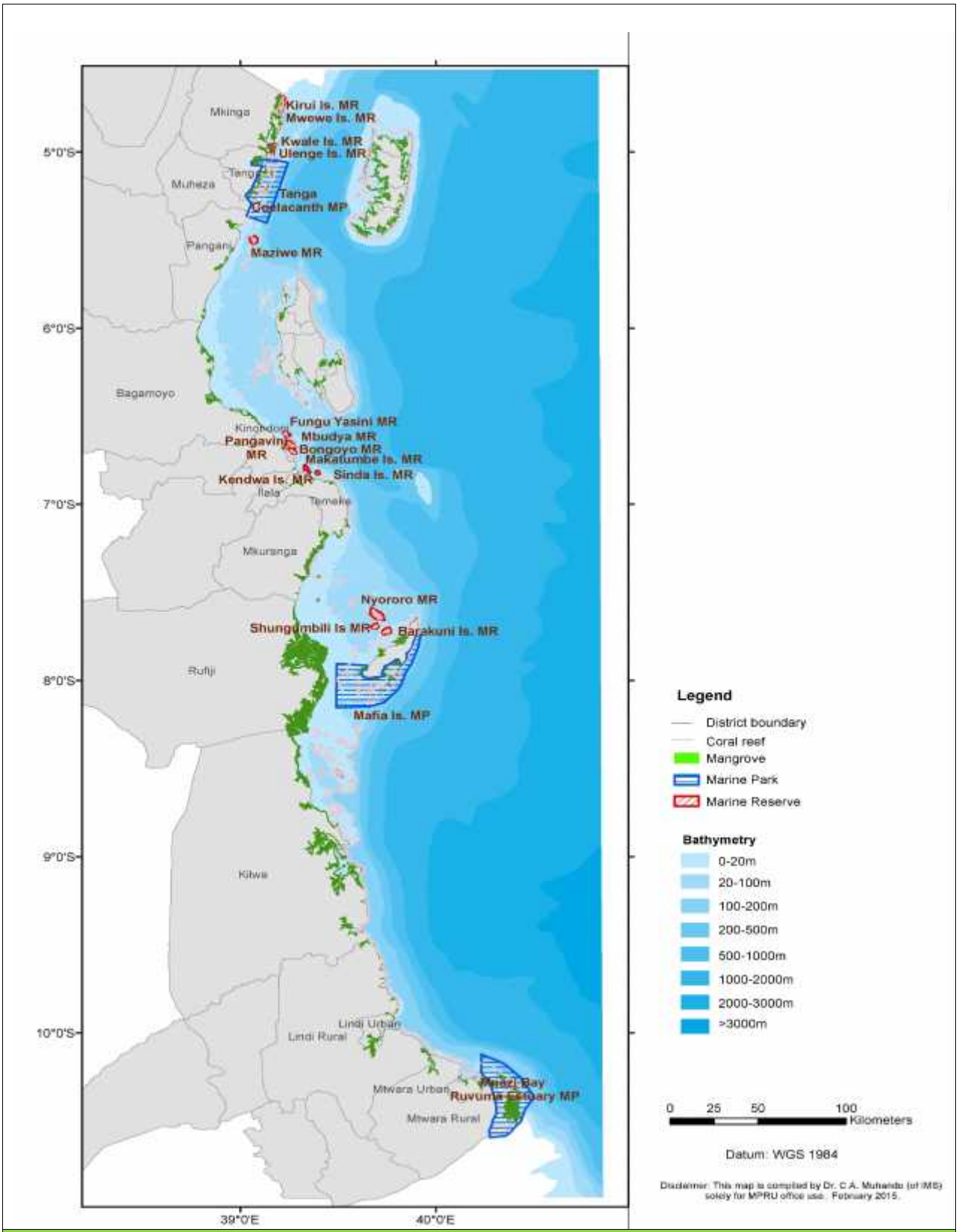

Figure 3-8: Map of Marine Protected Areas (URT, 2015)

Table 3-2: Protected Areas Gazetted under the MPRU Framework

No.	Name of the Protected Area	Area covered by the MPA (km^2)
1.	Mafia Island Marine Park (MIMP)	822
2	Mnazi Bay Ruvuma Estuary Marine Park (MBREMP)	650
3.	Tanga Coelacanth Marine Park (TaCMP)	552.17
4.	Mbudya Island Marine Reserve	14.22
5.	Bongoyo Island Marine Reserve	9.15
6.	Pangavini Island Marine Reserve	2.13
7.	Funguyasini Marine Reserve	22.90
8.	Kendwa Island Marine Reserve	5.30
9.	Inner and Outer Sinda Island Marine Reserve	1.80
10.	Inner & Outer Makatube Island Marine Reserve	7.78
11.	Shungumbili Island Marine Reserves	4.20
12	Nyororo Island Marine Reserve	21.0
13	Mbarakuni Island Marine Reserve	3.80
14	Maziwe Marine Reserve	4.50
15	Kirui Island Marine Reserve	36.10
16	Ulenge Island Marine Reserve	3.16
17	Mwewe Island Marine Reserve	0.40
18	Kwale Island Marine Reserve	12.13
19	PECCA – Pemba Channel Conservation Area	1000
20	MIMCA – Mnemba Island Conservation Area	522
21	MENAI Bay Conservation Area	700
	Grand Total	**4394.74**

3.5 Trends in the Status of Biodiversity

There is paucity of information and data to generate reliable trends on the current status of biodiversity in the country. In order to ascertain this, there is need to conduct regular assessment of biodiversity status in the country.

3.5.1 Positive Trends

Tanzania has registered significant progress in protecting some ecosystems and biodiversity at levels that surpass the 2020 Aichi Targets. This is demonstrated by the size of land under protection, which is about 40% of the total land area (6.5% of marine and 33.5% of terrestrial as illustrated under **Figure 3-9.** This progress is due to direct interventions by the URT under relevant Ministries to set up policies, legislations, Strategies and guidelines for protection of biodiversity in the country. These interventions have been supported by research and development programmes from the academia and public sector institutions working in the area of conservation and sustainable development.

In areas where protection has realized improvement in species populations such as the Serengeti and Tarangire-Manyara ecosystems, elephants have been seen to increase by 98% and 64% respectively with reference to the 2009 countrywide elephant census (TAWIRI, 2014).

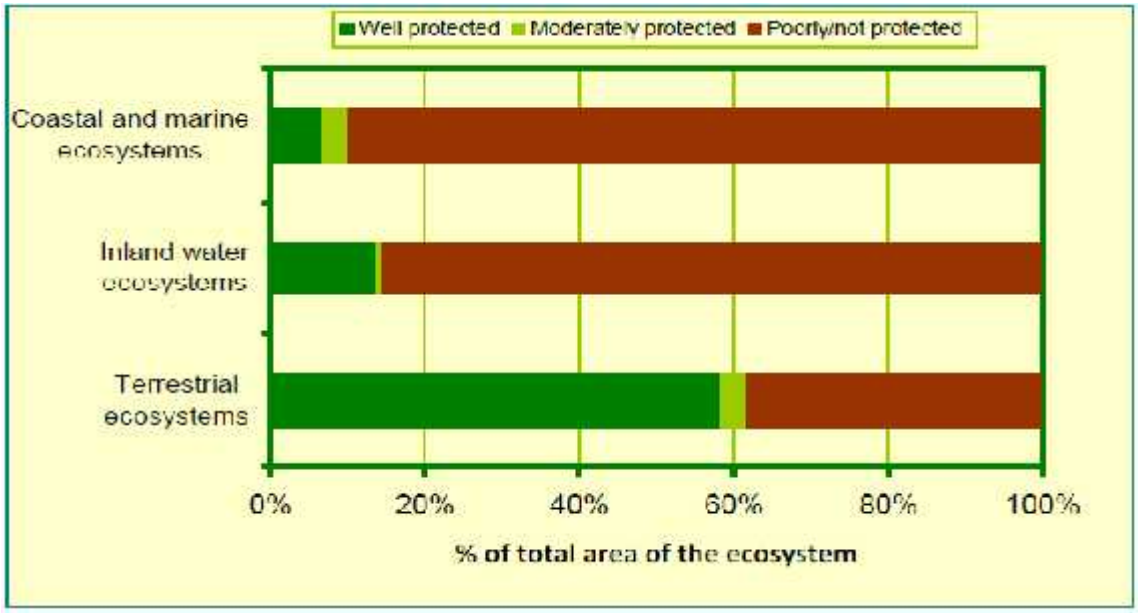

Figure 3-9: Protection level of different ecosystems in Tanzania (URT, 2014a)

In Zanzibar, there has been establishment of Nature Reserves and National Parks such as Chumbe Island Coral Park Ltd (CHICOP) and Jozani National Park. CHICOP was registered in Zanzibar in 1992 for the sole purpose of establishing and managing the nature reserve. Chumbe is classified as a Class II Protected Area under IUCN's WDPA listings. CHICOP Reef Sanctuary is declared as one of the most diverse in the region, and is believed to host 90% of East Africa's hard coral species (more than 200 species from 55 genera), 424 reef fish species critically endangered Hawksbill Turtle (*Eretmochelys imbricata*), and the endangered Green Turtle (*Chelonia mydas*). The Closed Forest Habitat possesses several, healthy individuals of the critically endangered Ader's duikers antelope (*Cephalophus adersi*) and a large population of the IUCN data deficient Coconut crab (*Birgus latro*), along with various species of endangered birds. The tree *Uvariodendron kirkii* is listed as Vulnerable and there are indications of rare reptiles on the island (CHICOP, 2013). Jozani National Park is recognized under the East Africa Marine Eco-region (EAME) hosting least 291 vascular plant species belonging to 83 families, 28 of which are endemic and 21 species known to be threatened or endangered. The national park is also rich with fauna having both terrestrial and marine species several of which are endemic, and some threatened such as the Zanzibar leopard (*Panthera pardus ardesi*) and the Zanzibar red Colobus monkey.

3.5.2 Regressive Trends

Ecosystem Trends

Despite the total land area under protection, Tanzania has lost at least one-third of its important ecosystems in the last few decades, undermining livelihoods of several communities that depend directly on them (URT, 2014a). Land cover trends of 1990 – 2010 suggest that forests and other wooded lands are declining, while land area used for other purposes is increasing (**Figure 3-10**), whilst a more recent study indicates the extent and magnitude of land degradation to have increased from 42% in 1980 to almost 50% in 2012 (URT, 2014c). The plateau, semi-arid and southern highlands agro-ecological zones in particular have recorded significantly higher levels of degradation compared to other agro-ecological zones (URT, 2014c).

High degradation is associated with poor farming practices and overgrazing that have greatly affected miombo woodlands in the plateau complement to the escalating population (projected to increase from 44.9 million people (2012) to 59.8 million by 2025), which will increase the demand for food resulting in more habitat loss and pressure on biodiversity in natural ecosystems.

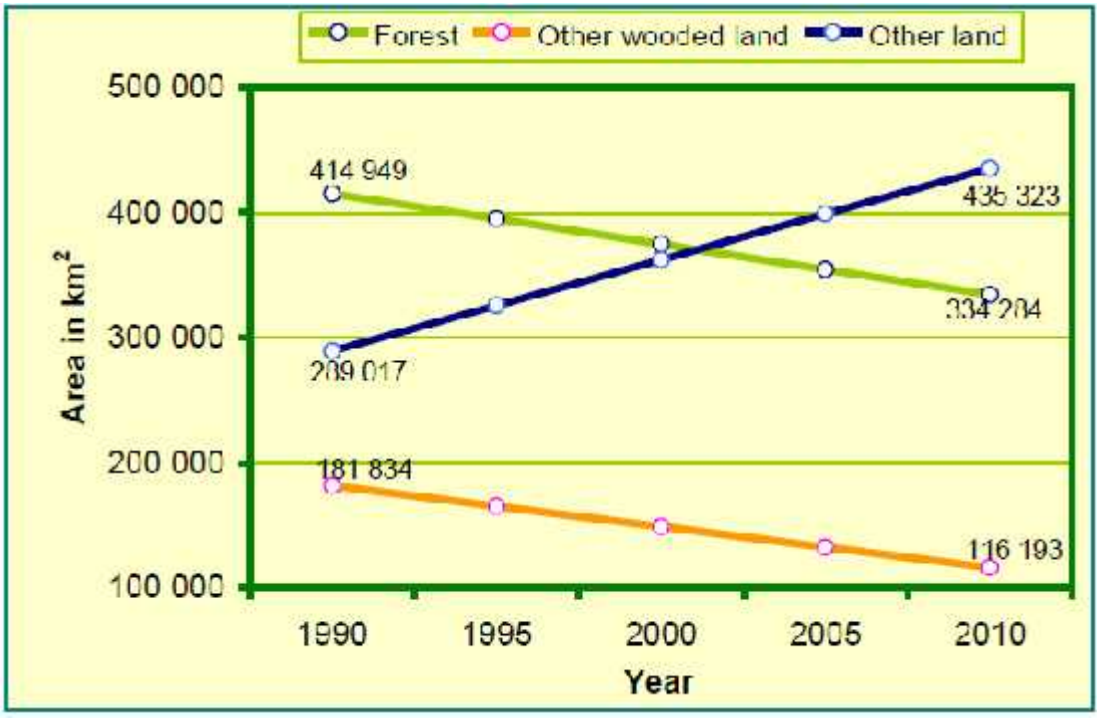

Figure 3-10: Trends of various land cover in Tanzania, 1990-2010 (URT, 2014a)

Area covered by mangroves also shows regressive trends (**Figure 3-11**). For example, in a period of 25 years (1980 – 2005), Tanzania mainland lost about 18% of its forest cover, at an annual loss of approximately 0.7%. Similarly, about half of the mangrove

forests in Zanzibar are considered as degraded (RGZ, 2013). Trends on the status of some ecosystems such as seagrass beds, coral reefs as well as freshwater could not be established due to lack of data. Nevertheless, it is considered that more than half of inland water ecosystems (rivers, lakes and dams) have been degraded. It is also estimated that 90% of the wetlands are under increasing pressure and in the process of losing many of their important functions and are continuing to be threatened.

Figure 3-11: Trends in mangrove area coverage for the period 1980-2005 (FAO, 2007)

Species Trends

Despite the paucity of information and data to generate reliable trends on the status of species diversity in the country, there are some indicators suggesting overall declining trends for a significant number of species. For example, the number of threatened species in the country indicates a dramatic increase of almost 3-fold compared to those recorded in the year 2000 (**Figure 3-12**). This can be linked to a number of factors including habitat loss, fragmentation and degradation, as well as climate change impacts.

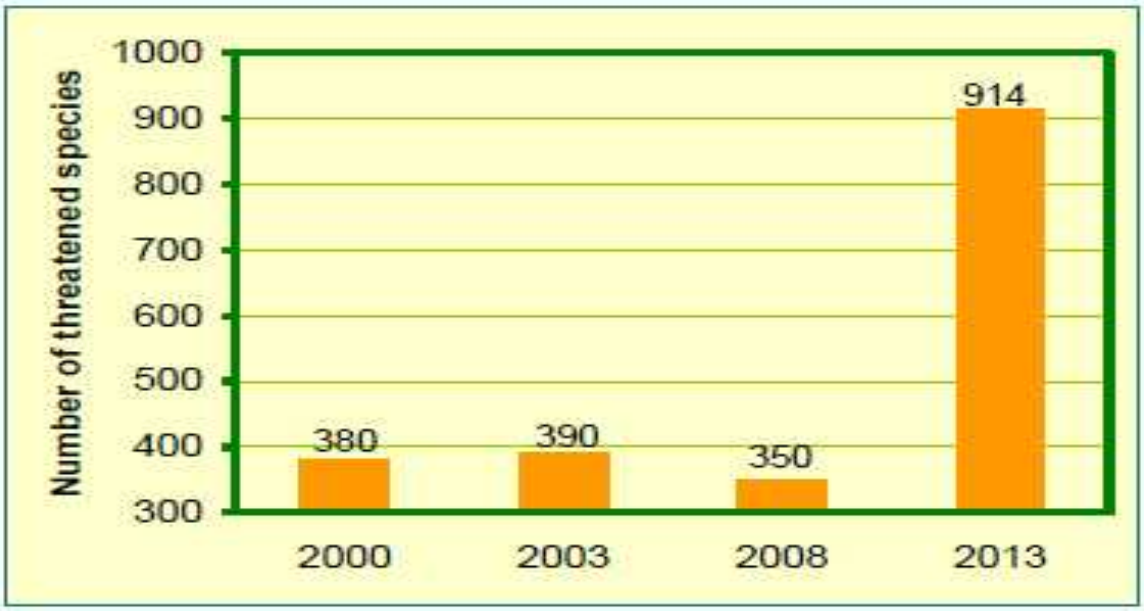

Figure 3-12: Trend of threatened species in Tanzania (2000-2013)
(URT, 2014a)

The elephant population in general, is decreasing at an alarming rate (**Figure 3-13**) and so are the black rhinoceros populations (Foley, 2014). TAWIRI (2014) registers the elephant population in Tanzania to have declined significantly from 109,051(±5,899 SE) in 2009 to 43,521 (±3,078 SE) in 2014; a 60% decline. Major declines having been from the Malagarasi-Muyovozi 81%, Ruaha-Rungwa 76%, and Selous-Mikumi 66%.

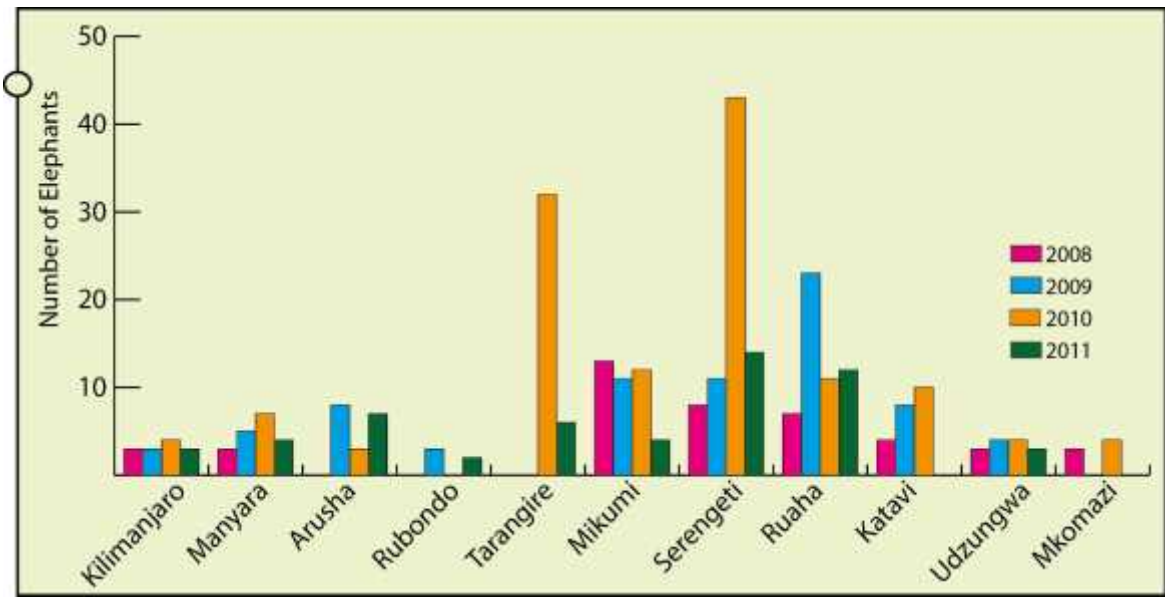

Figure 3-13 Number of elephants that died in Tanzania National Parks 2008-2011
(URT, 2014b)

Coastal and marine species such as sea turtles and dugongs are increasingly becoming rarer and overexploitation has led to decline in prawn catches (URT 2014a, **Figure 3-14**).

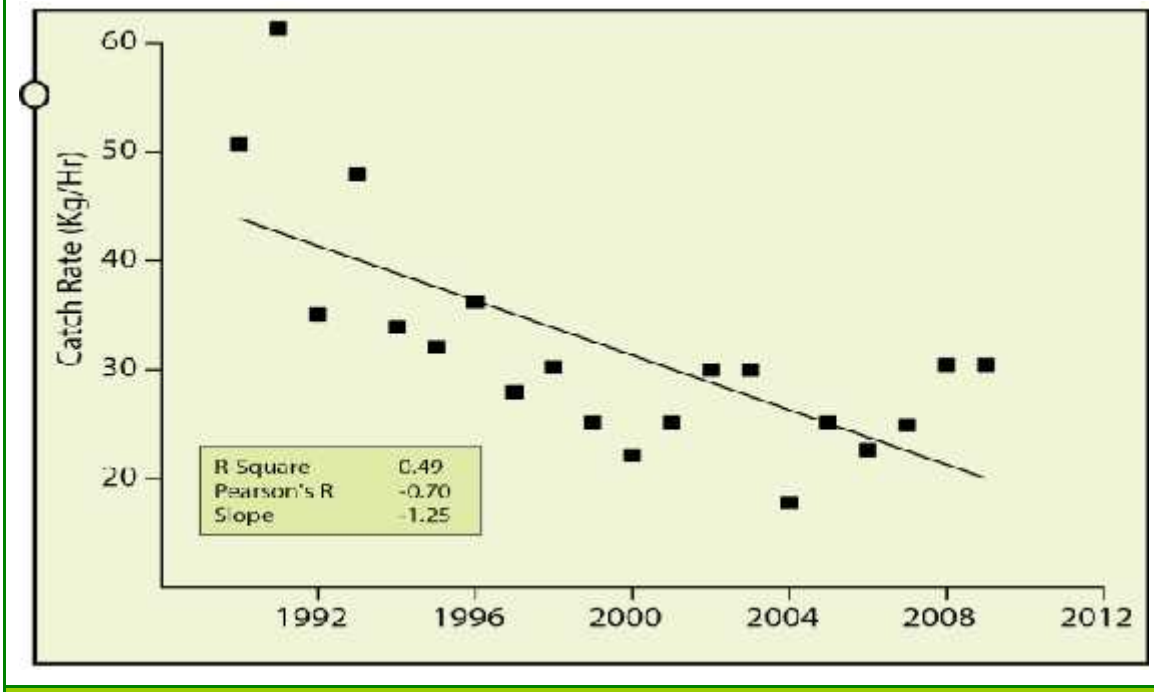

Figure 3-14: Trends in prawn production (1990-2011) (URT, 2014b)

In fresh waters an estimated 200 endemic fish species have declined (with about 56 native species considered extinct) in the Lake Victoria Basin due to a number of factors including introduction of the Nile perch (*Lates niloticus*) and Nile tilapia (*Oreochromis niloticus*). **Figure 3-15** shows the proportion of threatened species in Lake Victoria.

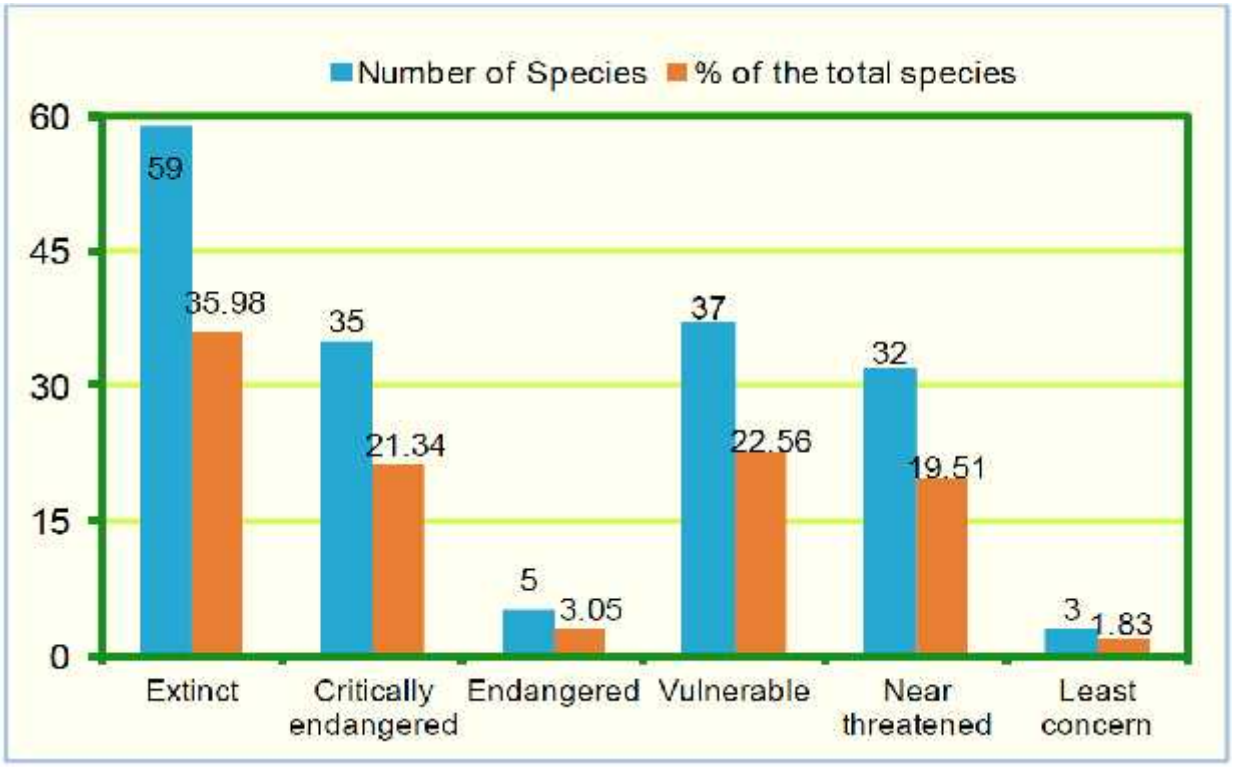

Figure 3-15: Proportion of threatened species in Lake Victoria (Adopted from URT, 2014b)

Genetic Trends

In recognition of the potential for indigenous plants and animals that can widen the food base and provide opportunities for other uses in agriculture, forestry, medicine, recreation, industry, etc. Tanzania has mandated organisations such as the Tropical Pesticide Research Institute (TPRI) and selected livestock research institutions to ensure protection of the genetic resources. Thus, species such as the world famous African violet (*Saintpaulia* spp) with 20 endemic species have been conserved for future utilisation.

3.6 Initiatives to Support Biodiversity Conservation

A key strength of the NBSAP 2001 has been implementation of large programmes and projects geared towards conservation of biodiversity and sustainable use, whilst contributing to the policy frameworks within the country and East African region. Some of the projects and programmes include:

a) *Lake Victoria Environmental Management Programme (LVEMP 1997-2017)*

The programme was implemented by three riparian states of Tanzania, Kenya and Uganda in two phases: LVEMP I (1997-2002) with objectives to: provide necessary information to improve management of the Lake ecosystem; establish mechanisms of cooperative management by the three riparian states; identify and demonstrate practical, self-sustaining remedies; and build capacity for ecosystem management. LVEMP II (2009-2017) is implemented by five (5) riparian states (Tanzania, Kenya, Uganda, Burundi and Rwanda) objectives are: improvement of the collaborative management of the trans-boundary natural resources of the LVB among the Partner States; and the improvement of environmental management of targeted pollution hot spots and selected degraded sub-catchments for the benefit of communities who depend on the natural resources of Lake Victoria Basin.

b) *Nile Trans-boundary Environmental Action Project (NTEAP) (2001–2009)*

This is one of the projects in the Nile Basin Initiative (NBI) implemented in collaboration with Burundi, DR Congo, Rwanda, Uganda, Kenya, Ethiopia, Egypt, and Sudan. The project is directed towards basin management and wetlands management.

c) *The Eastern Arc Mountain Conservation Programme (2003 – on-going)*

The Government through the Ministry of Natural Resources and Tourism (MNRT), in 2003 formulated a project namely “Conservation and Management of Eastern Arc mountain Forests”, with the objective“ of developing and implementing conservation strategies that ensure the sustainable conservation of the Eastern Arc Mountain forests, both for the conservation of forests and biodiversity.

d) *Tanzania Coral Reef Task Force (TZCRTF) (2002 – to date)*

TZCRTF is an on-going national programme formulated after the regional, Western Indian Ocean Coral Reef Task Force (WIO, CRTF) which was established in 2002 and endorsed as per the decision of COP 3/2 on the protection of coral reefs and associated ecosystems of the Nairobi Convention, held in Tananarive, Madagascar in 2004. The overall objective of the TZCRTF is to support the development of local capacity in research, management, governance, and coordinate communication at the national level, and serve as a platform to share information on regional initiatives. It also aims at assessing, managing, co-ordinating legal aspects in relation to curbing blast fishing in the country. The crosscutting issues are information dissemination and exchange as well as emerging issues. A Coral Reef Status Report is prepared and presented to the International Coral Reef Initiative General Meeting after every two years, guiding the Secretariat of the national planners and managers on all issues that relate to coral reefs and associated ecosystems.

e) Lake Tanganyika Biodiversity Project (2009-2014)

The project focuses on pollution control and other measures to protect biodiversity in Lake Tanganyika. Four countries namely Tanzania, Burundi, Democratic Republic of Congo and Zambia implemented the project with the objective to create capacity to manage the lake at a regional level as a sound and sustainable environment.

f) Scaling up Sustainable Land Management Project (2011-2015)

This is an ongoing initiative to upscale the best practices for sustainable management reduction of land degradation as the requirements of the National Action Programme to Combat Desertification (2014). Currently, two regions have initiated the projects Tabora for sustainable forestry in miombo woodlands; and Kilimanjaro for reduction of degradation on the highlands of Mt.Kilimanjaro.

g) National Action Programme to Combat Desertification (2014-2018)

This five-year programme contributes to the national effort to reduce, and where possible reverse the effects of and impacts of desertification, land degradation and drought.

h) Coastal, marine and island specific biodiversity management in the Eastern and Southern Africa Indian Ocean (ESA-IO) coastal states (2014-2018)

The objective of the programme is to develop and strengthen national and regional capacity to manage direct and indirect use of coastal, marine and island-specific ecosystems towards sustainable conservation of biodiversity.

i) UN REDD (2009-2013)

The UN-REDD Programme supports nationally-led REDD+ processes and promotes the informed and meaningful involvement of all stakeholders, including Indigenous peoples and other forest-dependent communities at national and international REDD+ implementation.

j) Man and Biosphere Reserve Programme (MAB) (on-going)

An on-going UNESCO-National supported programme which implements the Madrid Action Plan for the welfare of Man and Biodiversity (MAB) for management of the existing and nomination of new Biosphere Reserves in the country. NEMC is the national Focal Point for MAB programme in Tanzania, and as such, is mandated to supervise issue of conservation. NEMC therefore coordinates and develops periodic reviews for the existing Tanzania Biosphere Reserves (Lake Manyara; Serengeti-Ngorongoro and East Usambara established in 1981 and 2000 respectively). These ecosystems provide services and perform a number of ecological functions to support

the livelihoods of the surrounding communities. Due to their richness and value of their biodiversity, these sites have the national “conservation” status, of which, Lake Manyara and Serengeti are national parks under Tanzania National Parks (TANAPA), and Ngorongoro is a conservation area under the Ngorongoro Conservation Area Authority (NCAA). The latter is composed of nature and forest reserves as well as other land uses.

k) Kihansi Catchment Conservation and Management Project (KCCMP) – (2015 - 2018)

This is coordinated by NEMC as part of implementation of the conventions on Biological Diversity (CBD), the United Nations Convention to Combat Desertification (UNCCD), and the United Nations Framework Convention on Climate Change (UNFCCC). The government is implementing Kihansi Catchment Conservation and Management Project (KCCMP) under the support of Global Environmental Facility (GEF). The project aims at enhancing biodiversity conservation in the Kihansi catchment and complimenting on-going efforts of key resource regulatory authorities to conserve critically endangered and highly endemic plant and animal species in the Kihansi catchment.

l) Western Indian Ocean Maritime Highway Development and Coastal and Marine Contamination Prevention Project (WIOMHP) – (2009 – 2012)

WIOMHP aimed at reducing risks of ship-based environmental contamination (such as oil spills from groundings, and illegal discharges of ballast and bilge waters from ships). Overall objective of the project was to strengthen the capacity of countries to respond to oil or chemical spill emergencies in the region. The project developed and updated the National Marine Oil Spill Response Contingency Plan and Hazardous and Noxious Substance Contingency Plan; mapped the Environmentally Sensitive Areas; promoted Ecosystem valuation methodology as a common methodology in the region.

m) Agulhas and Somali Current Large Marine Ecosystems Project (ASCLMES) – (2007 – 2013)

The project was funded by GEF and implemented by UNDP with the aim to undertake an environmental baseline assessment of the Agulhas and Somali Current Large Marine Ecosystems to ensure the long-term sustainability of the living resources of the ASCLMES through an ecosystem based approach management. Project components targeted in cruise coordination where collection of offshore ecosystem and oceanographic data were archived. Also, capacity building component engaged training courses through research cruise and workshops. It also established communications strategy whereby coordination with Stakeholder partners and at Projects level was implemented. This project was working towards achieving at National Marine Ecosystem Diagnostic Analyses (MEDA), which contributed to the production of a Trans-boundary Diagnostic Analysis (TDA) and a Strategic Action Plan (SAP) for each of the LMEs (ACLME and SCLME). The strategic Action Plan (SAP) has initiated a

formulation of new Project called the Strategic Action Programme Policy Harmonisation and Institutional Reforms Programme (SAPPHIRE), which is yet to be operational.

n) Oil for Development (OfD) Programme – (2010 – 2015)

The Oil for Development (OfD) programme is within the Upstream Petroleum Sector through an institutional cooperation between the United Republic of Tanzania and the Kingdom of Norway. The operative goal of the programme (OfD) Tanzania is an "economically, environmentally and socially responsible management of petroleum resources that safeguards the needs of future generations". In this programme, component of Policy/Regulatory Framework is being coordinated by NEMC and VPO. The Occupational Safety and Health Authority (OSHA) coordinates the Health, Safety Environment and Security while Data Management is being led by The Tanzania Petroleum Development Cooperation (TPDC). In this programme, the component of human resource strategy and capacity building and training cut across all the Institutions.

3.7 Financing Mechanism for Biodiversity Conservation

The continued loss of biodiversity is acknowledged globally, and it is argued that part of the loss and inability to prevent loss and/ or restore degraded areas is due to insufficient investment in conservation. Viable contextual mechanisms to finance conservation supported by enabling policy environments and sustainable are important components when discussing biodiversity conservation. Biodiversity conservation can be financed using internal and or external sources both of which present a plethora of opportunities and challenges.

3.7.1 Internal mechanisms

Article 11 and 20(i) of the CBD call for internal financing considerations. The private good aspects of biological resources can be packaged into products and services that can be sold and revenue earned used to finance biodiversity conservation.

Internally generated revenue – Protected areas authorities such as TANAPA, Marine Parks Authority, as well as sector ministries, Ministry of Fisheries and Livestock Development and the Ministry of Natural Resources and Tourism exercise options for generating revenue for biodiversity conservation through, taxes or charges or fees on ecotourism, tropical timber exports or imports, airline travel, hunting concessions, harvesting contracts and visits to protected areas, zoos, and botanical gardens etc.

The country hosts a number of funds that support conservation. One such fund is the Tanzania Forest Fund (TFF) a Conservation Trust Fund established by the Forest Act Cap. 323 [R.E. 2002] under Sections 79 – 83, as a mechanism to provide long term, reliable and sustainable financial support to Forest Conservation and Sustainable Forest Management (SFM) in the Country. TFF is a Public Fund operationalized in July, 2010 as a Not-for-Profit organization governed by Board of Trustees. TFF provides

small (~5million TZS), medium (~10million TZS) and large (~50million TZS) grants in the form of money, technical assistance and or equipment dependent on the request. Tanzania Wildlife Protection Fund under the Wildlife Division is another national fund focused on the protection of wildlife in the country.

An innovative opportunity for earning revenue from biological resources is sale of bio-prospecting rights to international companies, in sectors such as pharmaceuticals, cosmetics, and agriculture this is yet to be taken advantage of.

Efficient use of resources – The management and accountability of funds for conservation through the operations of implementing bodies of the public, private and NGOs ensure benefits to the conservation efforts. The respective ministries MNRT, MLFD, MCST and Ministry responsible for Environment and their respective institutions annually allocate resources that support biodiversity conservation related activities from the central government budget.

3.7.2 External Mechanisms

i) *Development Partners Funding* – URT benefits support of international agencies such as The Global Environment Facility (GEF), which bases its support on the rationale of "incremental cost[2]".

ii) *Private Sector* - national and international NGOs leverage their support from individuals, family bequests, private foundations, and corporate foundations

iii) *Other sources for funding* – Public Private Partnerships where large programmes e.g. offsetting carbon to conserve tropical forests are considered including UN-REDD; loan capital - organisations like the World Bank and GEF consider this as a viable option for financing biodiversity conservation.

3.7.3 Incentives for Conservation

i) Presidential Award on Leadership and Excellency in Mining Activities - This is awarded to mining companies on recognition of their efforts in conserving the environment including biodiversity in mining activities.

ii) The Presidential Award on Conservation of Water Catchments - Planting and Management of Tree aims at enhancing participation of the Public and Private Sectors in the conservation of the environment and water catchments in efforts to

[2] GEF funds "incremental" or additional costs associated with transforming a project with national benefits into one with global environmental benefits; for example, choosing solar energy technology over coal or diesel fuel meets the same national development goal (power generation), but is more costly. GEF grants cover the difference or "increment" between a less costly, more polluting option and a costlier, more environmentally friendly option. Incremental cost is determined by: i) Determining the environmental problem, threat, or barrier, and the “business-as usual” scenario; ii) Identifying the global environmental benefits in line with GEF priorities (as prescribed); iii). Providing the incremental reasoning and GEF’s role; and iv) negotiating the role of co-financing.

combat desertification and drought, loss of biodiversity, which are major threats to the country.

iii) Establishment of Wildlife Management Areas - Communities are encouraged to set aside areas for wildlife conservation and undertake different wildlife related enterprises for their- own benefits.

iv) Establishment of BMUs - BMUs – legally constituted organisations at local and community level responsible for managing the fisheries and the beaches over which they have jurisdiction, for their own benefits.

v) Implementing Participatory Forest Management/Joint Forest Management - Participatory Forest Management which is contained in the Forest Act, 2002 provide legal basis for communities to own, manage or co-manage forest under wide range of conditions, including benefits from the forest resources.

3.8 Lessons learnt from the NBSAP 2001

The NBSAP 2001 was developed prior to the Aichi targets of 2010 and its priorities were clustered in a different manner from Aichi 2010. Thus, despite the significant achievement registered (URT, 2014a), NBSAP 2001 was not directly monitored in line with the indicators set under Aichi Targets, but as indicated earlier, there are significant overlaps. Nevertheless, the lesson learnt from a self-assessment of NBSAP 2001 recast around the Aichi 2010 targets and are listed as follows:

- Target 1: Public awareness is being undertaken by various actors including media, politicians, academia and NGOs – *however, there is no comprehensive strategy or collation of the existing sector specific strategies that has been done*.

- Target 2: Environmental sustainability including biodiversity has been mainstreamed into the National Strategy for Growth and Poverty Reduction (2010-2015) and Tanzania Development Vision 2025; State of the Environment reporting, as a requirement of the Environmental Management Act (2004), includes biodiversity. *Monitoring and registering of impact is yet to be comprehensively assessed*.

- Target 3: Positive incentive for communities around nature conservation areas e.g. apportioning part of revenues to the local communities (PFM, WMAs, BMUs, and Villages). *The incentives need to be broadened beyond these areas as poaching and destruction of forests is still rampant, address of financial inclusion is key*.

- Target 4: The National Programme on Sustainable Consumption and Production has been developed (2007); The Sustainable Cities programme is being implemented since 1992; A total of 37 local industries and institutions have switched to natural gas (since 2004); Alternative energy sources (biogas, wind

and solar) and efficient cooking stoves are being promoted in an attempt to curb massive deforestation, since more than 90% of national energy consumption constitute biomass energy. *The impact of this effort is to be documented and made available as part of NBSAP reporting.*

- Target 5: A total of 344,511 cattle, 134,317 goats and 102,023, sheep were evicted from Ihefu wetland (about 150km^2) in 2006/2007, which has resulted into regeneration of vegetation and increased water levels; General Management Plans (GMPs) for protected areas (forest, wildlife and fisheries) have been developed and are being implemented; In 2013 alone, 15 Forest Management Plans and 8 maps were developed; as well as 479 beacons erected in Central and Lake Zones. *The impact of this effort is to be documented and made available as part of NBSAP reporting.*

- Target 6: The strategy for Urgent Actions for Conservation of Marine Environment, Lake, Rivers and Dams was developed in 2008 and is being implemented; A total of about 2,500 km^2 of marine waters (or 8% of territorial sea) are managed through Collaborative Fisheries Management Areas (CFMAs); To reduce pressure on natural fish resources, aquaculture is being promoted whereby, a total of 19,000 ponds for tilapia with an area of 150 m^2 each have been established; Operations and campaigns against Illegal fishing. *The impact of this effort is to be documented and made available as part of NBSAP reporting.*

- Target 7: Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) are currently being conducted as indicated in EMA 2004 and its subsequent Regulations. *EIA and SEA are yet to be regularly published in the public domain thus the impact of these is not sufficiently visible*.

- Target 8: Implementation of the National Land use Master Plan and various measures have resulted in reduced pollution; A Basin-Wide Strategy for Sustainable Land Management in the Lake Victoria Basin was developed in 2012; Water Quality Management and Pollution Control Strategy was developed in 2011; and the Water Sector Environmental Action Plan was developed in 2011; More than 70 industries have participated and implemented activities as part of the cleaner production programme; and Guidelines for Water Resource Monitoring and Pollution Control was developed in 2012. *The impact of this effort would benefit documentation made available as part of NBSAP reporting.*

- Target 9: A number of programmes have been implemented such as Lake Victoria Environmental Management Programme (LVEMP-II) which has expanded the management of water hyacinth to Kagera Basin catchment; Integrated Pest Management Plan (IPMP) was developed in 2009; Indian House Crow Eradication Programme is being implemented in Dar es Salaam, Tanga, Morogoro and Zanzibar. *The impact of this effort is to be documented and made available as part of NBSAP reporting.*

- Target 10: Several strategies were developed during the period, including, the National Climate Change Strategy in 2012; Strategy for Urgent Action for Conservation of Coastal and Marine Environment, Lakes, Rivers and Dams is being implemented; Integrated Coastal Zone Management Strategy is being implemented; and Coastal tourism project is being implemented to ensure sustainable tourism. *The impact of this effort is to be documented and made available as part of NBSAP reporting.*

- Target 11: Tanzania has designated 40% of total land area to wildlife and forest protected areas and 6.5% of territorial sea to marine protected areas. Water Basins have identified 174 threatened water sources to be demarcated by 2019 and 59 water sources have been protected and gazetted by 2013. Preparation of Programme for effective and sustainable protection and conservation of water sources (2014/15 – 2018/19) is on-going. *The impact of this effort is to be documented and made available as part of NBSAP reporting.*

- Target 12: The Elephant Management Plan (2010-2015) is in place; Routine anti-poaching operations are being conducted; A National anti-poaching action plan is being prepared. *Anti-poaching efforts are to be documented and made available as part of NBSAP reporting.*

- Target 13: The National Plant Genetic Resource Centre (NPGRC) has been established and the Biotechnology Policy (2010) is in place; Regulations on Access and Benefit Sharing of Genetic Resources (ABS) are being prepared; Phenotypic characterization in cattle has been done and has led to the distinction of indigenous cattle breeds and strains; Existence of some infrastructures such as the National Artificial Insemination Centre makes it possible to have ex-situ conservation of livestock genetic resources in the form of semen, ova and embryos; Ratification of the Nagoya Protocol on ABS of Genetic Resources is underway. *The impact of the characterizations is to be documented and made available as part of NBSAP reporting.*

- Target 14: Strategy on Urgent Actions on Land Degradation and Conservation of Water Catchments (2006) is being implemented; Strategy for Urgent Action for Conservation of Coastal and Marine Environment, Lakes, Rivers and Dams (2008) is being implemented; Environmental conservation programmes for priority ecosystems are being implemented in Lake Victoria and Lake Tanganyika; Integrated Water Resources Management and Development Plans are in place for each of the nine Water Basins; Tree planting campaigns. *Milestones, targets for the strategies are not indicated as having been met or outstanding*.

- Target 15: National Climate Change Strategy (2012) is in place to address adaptation and mitigation to climate change impacts. National Action Plan to Combat Desertification (2010) is in place; Sustainable Land Management (SLM) Programme is being implemented in several parts of the country; REDD+

initiatives are present in several parts of the country. *The impact of this effort is to be documented and made available as part of NBSAP reporting*.

- Target 16: The National Focal Point and Competent Authority for the Nagoya Protocol have been designated; Ratification of the Nagoya Protocol on Access and benefit sharing (ABS) is in progress; Regulations on ABS are being finalized. *Outreach for public awareness is limited by resources.*

- Target 17: The NBSAP has been revised (this document). *The NBSAP should be regularly reviewed and resourced*.

- Target 18: Traditional knowledge and practices are being promoted and recognized in national biodiversity conservation efforts; The Draft Regulations on ABS recognize and integrate traditional knowledge associated with conservation of genetic resources and germplasm. *Outreach for public awareness is limited by resources.*

- Target 19: Tanzania Biodiversity Information Facility (TANBIF) is in place; Annual National Biodiversity Forum is being organized; National Environmental Communication Strategy is being finalized. *Interoperability of the platform, access, content, update and review need to be improved.*

- Target 20: Tanzania Wildlife Protection Fund (TWPF) is in place; National Environment Trust Fund has been established and initiatives to operationalise are underway; Tanzania Forest Fund is in place; Eastern Arc Mountain Endowment Fund is in place. *There is need for a coordinated financial mechanism to support biodiversity conservation.*

In general, 28.6% of the priority actions in the NBSAP have been fully achieved, 23.8% substantially achieved, 42.9% achieved to a limited extent, and 4.7% not achieved (**Figure 3-16**). Thus, the Action Plan aims to further implement, complete and establish new targets in line with the Aichi 2010 monitoring indicators.

The progress made from 2001 has been limited by a number of challenges. These include:

i) Inadequate mainstreaming of biodiversity issues in sectors and Local Government plans and budgets.
ii) Low level of awareness of the public on the socio-economic importance of biodiversity;
iii) Inadequate participation of communities in the management of biodiversity;
iv) Inadequate resources to fully implement all the priority actions identified for each biodiversity component;
v) Insufficient data about biodiversity, inadequate capacity for research and dissemination, and insufficient collaboration between institutions that manage data;
vi) Inadequate capacity for coordination and collation of impact of outcomes and outputs of the various interventions; and

vii) Inadequate reporting and feedback from implementing institutions on deliverables.

In addition to the challenges mentioned, infrequent monitoring; regular reporting and lack of update limited the NBSAP 2001 and revision of the document as was initially intended to be i.e. every 3-5 years. Thus, this NBSAP will readdress the targets setting specifics for the next reporting period.

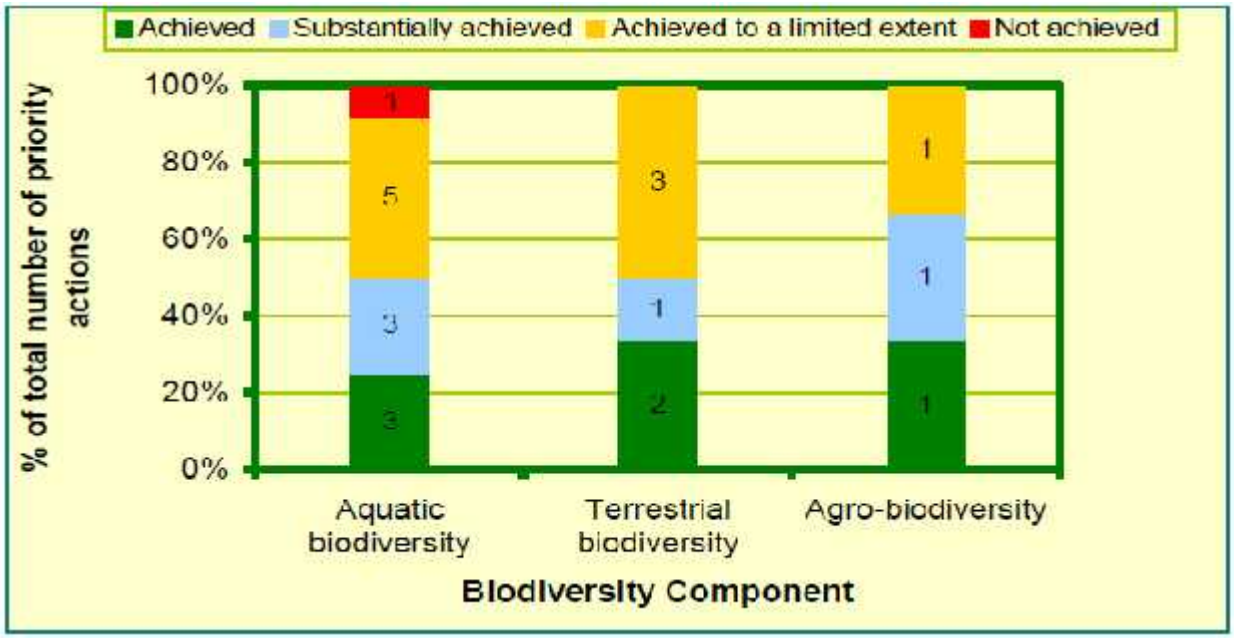

Figure 3-16: Analysis of extent of implementation of the NBSAP (2001) (URT, 2014a)

CHAPTER FOUR

THREATS TO BIODIVERSITY

4.1 Main Threats

Despite the biodiversity richness and conservation commitments in place, Tanzania's biodiversity is experiencing substantial reduction in ecosystem quality and species numbers and diversity. The main threats to biodiversity include habitat loss and degradation, overexploitation of plant and animal species, pollution, introduction of invasive alien species, exploration and extraction of oil and gas, climate change and genetic erosion.

4.1.1 Habitat loss and degradation

Human activities due to rapidly growing population have been one of the major causes of habitat loss and degradation resulting into biodiversity decline in Tanzania. Conversion of natural lands to other land uses such as settlements, agriculture and grazing; habitat degradation due to fires, unplanned land use, unmanaged natural resource extraction have resulted into serious habitat degradation and consequent loss of biodiversity in the country. Other serious threats to habitats include fuel wood gathering, mineral and aggregate mining, commercial logging, coral destruction and infrastructural development.

a) Terrestrial habitats

Agricultural expansion (**Plate 4-1**) plays a significant role in habitat fragmentation and subsequent biodiversity loss in many areas within the country. Along with crop farming, there is an increasing demand for grazing land and feeds for the growing number of livestock. The number of cattle and goats between 1961 and 2008 increased almost three times from 8 to 21.3 million and 4.5 to 15.2 million, respectively (URT, 2011). Coupled with unsustainable agricultural practices expansion of agricultural and grazing land has led to fragmentation of natural habitats thereby escalating pressures on biodiversity.

Farmers and livestock encroach into protected areas creating serious pressure to wildlife resources. In Tarangire National Park where the majority of large mammal species migrate seasonally to village land, loss of migration corridors due to agriculture could lead to collapse of large mammal populations in the park (Foley, 2014). Sixteen per cent of the corridors are in extreme condition (probably less than 1 year remaining or already closed), 58% are in critical condition (probably less than 3 years remaining) and 26% are in moderate condition (less than 20 years remaining) (URT, 2014a).

Plate 4-1: Forest degradation due to agricultural activities

Plate 4-2: Forest fire - one of the major causes of biodiversity loss in Tanzania

Forest fire (**Plate 4-2**) is another serious threat especially to forests in the country and is reported to be increasing at an alarming rate (URT, 2008). Most fires are caused by human activities particularly farm preparation. Other causes include game hunting, honey collection, charcoal burning, and burning to simultaneously improve pasture quality. FAO (2013) reported a magnitude of the problem at an average of 11 million hectares burnt annually. A study by NAFORMA (2015) observed disturbance by fire in 24% of forest area of Tanzania. Over 900,000 fires have been detected in Tanzania by satellite between (November 2000 and July 2011), with the number of fires and extent of burnt areas per year being reasonably consistent (**Figure 4-1** and **Figure 4-2**). Gazetted lands accounts for the major proportion (approximately 77%) of the burnt area (FAO, 2013).

Figure 4-1: Trends of active fires in Tanzania (*FAO, 2013*)

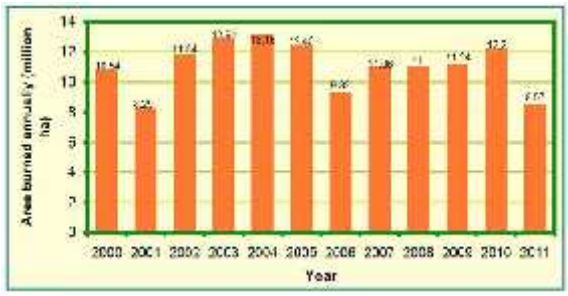

Figure 4-2: Trend of annually burned area in Tanzania *(URT, 2014a)*

b) Coastal and marine habitats

Similar to terrestrial forests, mangrove forests are cleared to pave way for other land uses including settlements, agriculture, solar saltpans and mariculture. For instance

extensive stretches of riverine mangroves of Rufiji have been reclaimed during the last few decades for rice farming (FAO, 2005).

Blast fishing has escalated problems in the fishing industry in Tanzania; each blast of blast instantly kills all fish and most other living organisms within a 15 to 20 meter radius, and completely destroys the reef habitat within that radius. The damage to the coral reef structures is devastating and in many cases permanent (URT, 2014a). Other unsustainable and destructive fishing practice is fish poisoning which also results to killing almost every organism within its range.

c) Inland water habitats

The major threats to freshwater habitats are related to declining water levels due to reduced rainfall, increased evaporation and siltation due to increased agricultural activities. Conversion of wetlands to other land uses such as for agriculture and urban development are also responsible for biodiversity loss in some areas of the country. Other threats include overexploitation of the fish stocks leading to decline in fish species diversity, illegal fishing, introduction of exotic fish species especially Nile perch and water hyacinth, pollution and eutrophication due to nutrients enrichment especially phosphorus and nitrogen.

4.1.2 Overexploitation of plant and animal species

Overexploitation of terrestrial and aquatic plant and animal species is another major cause of biodiversity loss in the country. This problem is exacerbated by the growing demand for some plant and animal products, largely acknowledged to be of high value.

a) Terrestrial habitats

Forests have suffered tremendous loss from overexploitation due to fuel wood and timber production. Forests alone contribute over 90% of energy (both firewood and charcoal) consumption (URT, 2014a). Hardwood demand for timber and other uses places tremendous pressure on forests and is threatening the existence of some hardwood tree species like *Pterocarpus angolensis* (Mninga), *Dalbergia melanoxylon* (Mpingo); *Chlorophora excelsa* (Mvule) and *Afzelia quanzensis* (Mkongo).

The wide use of plants for medicinal purposes has led to overexploitation of some plants. In August, 2010, a huge amount of the plant *Carissa spinarum* (Murigariga) had to be harvested to satisfy the demand of tens of thousands of people visited Samunge Village in Loliondo Division Arusha Region to receive treatment from a herbal drink extracted from this species.

Despite country's richness in wildlife biodiversity, wildlife is under tremendous pressure from unsustainable exploitation of the animal species and Human-wildlife conflicts. Impacted species include the larger carnivores such as lions (*Panthera leo*), leopards (*Panthera pardus*), cheetahs (*Acinonyx jubatus*), wild dogs (*Lycaon pictus*) and the

herbivores group includes population of elephants (*Loxodonta africana*), Giraffe (*Giraffa camelopardalis*), zebra (*Equus burchelli*), buffalo (*Syncerus caffer*), antelopes, wildebeest (*Connochaetus taurinus*), and black rhinoceros (*Diceros bicornis*). Out of these species, rhinoceros and elephants are the most highly endangered due to poaching, mainly to satisfy the fast growing trade for ivory and tusks in Asian markets. As confirmed by recent DNA tests for jewellery and ornaments in Asia about 50% of tusks tested came from Tanzania (URT, 2014a). Wildlife poaching for meat is also a widespread problem in many ecosystems. Recent studies showed an average of 2,078 tons of illegal bush meat is being confiscated annually.

b) Coastal and marine ecosystem

Mangrove tree cutting for fuel wood, timber, poles production for other uses has resulted into significant habitat loss in many areas along the coast. In some areas the popular *R. mucronata* has been exploited to levels that have resulted in a great reduction in tree biomass and a shift in species composition, with seedlings and saplings of the fast-regenerating species like *C. tagal* dominating (Wagner *et al.*, 2001).

c) Inland water ecosystems

In Lake Victoria, the annual quantity of Nile perch harvest is estimated to be 101,298 tonnes compared to the total available stock estimated at 165,439 tonnes in 2011 (URT, 2013). In addition, fish species in inland water ecosystems are affected by illegal and unsustainable fishing methods such beach seines. In 2010/2011 and 2011/2012 the use of different types of illegal gears in Lake Victoria, increased from 6,415 to 146, 657 respectively where beach seines alone accounted for 368% from 394 to 145,302 (URT, 2014a).

4.1.3 Pollution

Most aquatic habitats suffer from excessive levels of nutrients mainly phosphates and nitrates that originate from domestic, industrial as well as agricultural activities. Herbicides and pesticides used in agriculture find their way into aquatic systems, and most of these are toxic to wildlife. Heavy metals such as lead, cadmium, iron and copper from industries and mining activities, and organic wastes from sewage, can accumulate in aquatic systems and affect water quality and species survival, and could have a long-term detrimental health effects if taken up higher in the food chain. The wide use of agro-vet chemical products of inferior or questionable efficacy threatens the survival of biodiversity and lowering the productivity of the environment. Spillage of oil due to marine accidents and leakage from reservoir tanks and organic wastes from leaking sewage systems can accumulate in oceans, rivers and other freshwater bodies and affect water quality and species survival. Equally important are solid wastes and particularly plastics, which pose enormous threat to biodiversity especially in urban areas (URT, 2014b).

4.1.4 Introduction of Invasive Alien species

Invasive Alien Species (IAS) are characteristically adaptable, aggressive and have a high reproductive capacity and hence can thrive well in areas beyond their range. The spread of invasive species is now acknowledged as one major threat to biodiversity in the world as they can outgrow natural species over an area. In Tanzania over 60 species (Appendix 3) have been documented as invasive species (TANBIF, 2010; and URT, 2014b). They are a major cause of species extinction (Norton, 2009) and may result in local ecosystem change include through competition with or predation on local species, alteration of ecosystem functioning, and even genetic contamination (Shea and Chesson, 2002).

a) Terrestrial habitats

Several IASs that are trees and shrubs exist in forest ecosystems of Tanzania (Appendix 3) such as *Maesopsis eminii*, *Cedrella odorata* and *Senna spectabilis*. In Kimboza Catchment Forest (Morogoro Region), *C. odorata* has colonized a large part of the forest, crowding out native species and almost replacing the indigenous tree species. Similarly, more than 10 other IASs threaten Amani Nature Reserve.

Introduction and spread of IASs in agricultural ecosystems is mainly through agricultural practises, climate change and changes in atmospheric composition as well as biological control of pests. However, the impacts of invasive plants on agro-ecosystems are often ignored or seen as unimportant because they are not easy to quantify, especially in the developing world, which means that little is done to mitigate their impacts. Parthenium weed, *Parthenium hysterophorus* a fast maturing plant, which can survive under low moisture conditions, and produces many seeds (up to 25,000) that can remain dormant for 3-5 years is one of the many Invasive Alien Plants (IAP's) that has been accidentally introduced into Tanzania. The weed is reported to cause up to a 40% reduction in crop yields (GISP, 2004). Where it invades, it displaces pasture species, reducing available grazing. Other IAPs include *Lantana camara*, *Prosopis juliflora*, *Psidium guajava*, *Senna spectabilis*, *Acacia farnesiana*, *Acacia mearnsii*, *Acacia polyacantha* and *Chromolaena* odorata (Appendix 3). Effects of some IAPs are illustrated in **Plate 4-3**.

Parthenium hysterophorus infestation in a bean crop field in Kijenge, Arusha Municipality

Chromolaena odorata infestation on cassava crop in Nyasense village, Serengeti District

Plate 4-3: Invasion of alien plants in some crop fields in the country (MAFC, 2012)

b) Coastal and marine habitats

There are several significant vectors of transfer for marine organisms, including intentional introduction (e.g. for fisheries or aquaculture) and unintentional means, such as biofouling on ocean-going vessels, accidental release from aquariums, and discharge of ships ballast water, which is thought to be the most serious modern vector. Almost any type of organism can be transferred in situations where water is transported from one ecosystem to another, due to the planktonic life stages that most marine species undergo. A total of five introduced species and three cryptogenic species have been recorded (ASCLME, 2012). Introduced species include two cultured macroalgae species (*Eucheuma denticulatum* and *Kappaphycus alvarezii*), one cultured oyster (*Saccostrea cucullata* species), one Asian mussel (*Musculista senhousia*) and bacterial speces (*Vibrio cholera*). The cryptogenic species include two species of macroalgae (*Acanthophora spicifera* and *Gracilaria salicornia*) and one species of coral (*Tubastraea coccinea*). More serious concern in Tanzanian waters is the introduction of the Asian Mussel *Musculista senhousia*, however, no information is currently available on the severity or extent of the invasion, calling for further assessment and monitoring of this invasion.

c) Inland water habitats

The Nile Perch (*Lates niloticus*) in Lake Victoria is believed to have led to the disappearance of several indigenous haplochromine species (LVEMP, 2005). Being a carnivorous fish, the Nile perch fed on native fish species leading to the decline of the other species, meanwhile the population of the Nile perch grew. It is estimated that about 200 species of haplochromines in Lake Victoria were decimated through predation by Nile perch. Though still present in some satellite lakes in the Lake Victoria basin where Nile perch is absent, *Oreochromis esculentus* virtually disappeared from the main lake. Due to competitive exclusion some riverine native fishes such as *Labeo victorianus*, *Bagrus dockmac*, *Barbus altianalis* and *Schilbe mystus* occur in Lake Victoria only in small populations close to the river inflows and outflows (URT 2014a). Water hyacinth has also invaded Lake Victoria starting early 1990's reaching peak at 4,081 ha in March 1998 declining to 117 ha in April 2001 following interventions by the LVEMP (LVEMP, 2001). Until 2010, the coverage of water hyacinth remained in the range of 518 ha on the Tanzanian section of the Lake. The invasion of water hyacinths in the lake is linked to the reduction in fish in the lake through deoxygenation of water and reduction of nutrients in sheltered bays, which are breeding, and nursery grounds for fish, particularly tilapia.

4.1.5 Oil and gas exploration and extraction

Exploration for oil and gas in the country began in 1952. To date, 53 wells have been drilled to completion and six more are in varying drilling stages. Gas fields have been discovered in Songo Songo, Mnazi Bay, Mkuranga, Kiliwani, Ntorya and in the deep sea off the coast of Tanzania**.** Extraction and use of natural gas at Songo Songo started in 2004 while commercial production at Mnazi Bay gas fields started in 2006. Natural gas

operations can result in adverse and lasting effects on the environment and biodiversity in general. Construction of pipelines can negatively impact biodiversity in marine ecosystems including disturbance of fish habitats and disruption of migratory pathways.

4.1.6 Genetic erosion

Overall, the decline of crop diversity is largely a result of the replacement of traditional cultivars with high yielding modern cultivars. Land degradation as in degraded lands farmers tend to concentrate on production of stress adapted species e.g. Cassava, sorghum and millet production is strongly linked to biodiversity loss. Changes in agricultural practices and the use of genetically uniform modern cultivars contribute to replacing and marginalizing the highly diverse local cultivars and landraces in traditional agro-ecosystems. In areas where there has been an influx of refugees there has been severe genetic erosion due to over exploitation of the traditional germplasm. In many cases documentation is lacking for the extent of agro-biodiversity reduction and genetic erosion or to what degree this has been caused by human or natural disasters. Other threats include overexploitation of land and other natural resources, land use changes, fewer farmers cultivating the threatened crops, pests and diseases, drought, floods, lack of markets, deforestation, low priority of research and production of indigenous vegetables, poor seed distribution and availability, and lack of awareness on indigenous vegetables (MAFC, 2012).

4.2 Underlying Causes

The underlying causes for biodiversity loss can broadly be categorized into three main groups (i) socio-economic and cultural environment, (ii) climate change, and (iii) inadequate policy, legal and institutional response to biodiversity loss.

4.2.1 Socio-economic and cultural environment causes

***Population growth*:** The population of Tanzania is rapidly growing, and has increased from 12.3 million people in 1967 to 44.9 million people in 2012 (**Figure 4-3**), with almost doubling between 1988 and 2012 (URT, 2012a), and it is projected to about 59.8 million by 2025. About 74% of Tanzania's population live in rural areas depending on subsistence agriculture, whose harvests are highly unreliable, forcing them to depend on natural resources in order to meet their basic needs such as food, firewood, construction materials, water and income leading to unsustainable exploitation of natural resources and degradation of habitats and/or loss of biodiversity. More land is being converted to farmed land in order to produce food and other agricultural products, water basins notably Rufiji and Ruaha water basins are intensively converted into farmed land; forests are increasingly being degraded to meet demands of forest products such as fuel wood and timber. In some cities and large urban areas, settlement expansion is usually unplanned and starts to encroach into nearby forest reserves adding more pressure on adjacent forests like Pugu, Kazimzumbwi, Vikindu in the case of the fast expanding Dar es Salaam City. Furthermore, the rate of urban growth and population increase has outpaced and compromised the capacity of

responsible authorities to provide facilities for controlling pollution thus jeopardising public health and integrity of the environment (URT, 2014a).

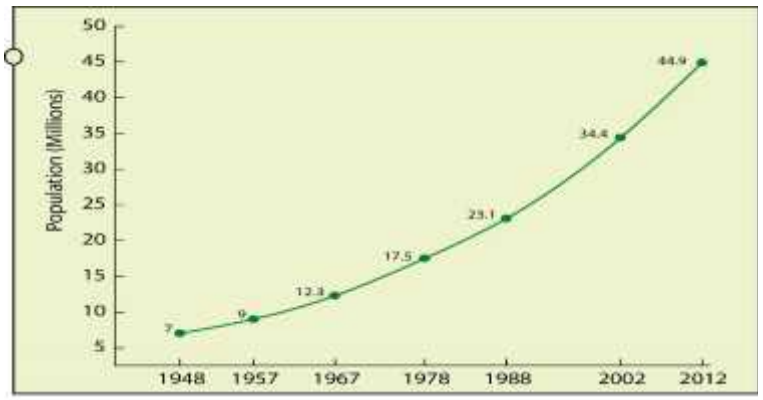

Figure 4-3: Tanzania population trend (1948 – 2012) (*URT, 2012a*)

***Poverty*:** About 34% of Tanzanians live below poverty line (URT, 2012b); with poverty rates being highest in rural areas. Considering that about 74% of Tanzanians populations are found in rural areas it is obvious that dependence on natural resources is immense. Majority of poor Tanzanians are primarily dependent on agriculture. In fact about 80% of the labour force in Tanzania earns a living through agriculture, majority of these being peasants in the rural areas. The cultivation is to a large extent marked by poor farming methods that exposes land to soil erosion. In addition, the poor in Tanzania rely on wood fuel for energy. This type of energy accounts for about 90% of all energy sources in Tanzania, which menacing the future existence of forests and associated flora and fauna in the country.

***Economic growth*:** Global economic growth has resulted into competing demand for food, feed, fibre and fuel, intensifying pressures on land. Apart from catering for domestic demand for these materials, Tanzania is among the sources of these materials to the global economy. Consequently, many terrestrial ecosystems are seriously being degraded because land use decisions often fail to recognize non-economic ecosystem functions and biophysical limits to productivity (URT, 2014b). Intensive use of agro-chemicals to improve agricultural yields has contributed to pollution of aquatic systems. Water abstraction for agriculture has further led to destruction of aquatic systems. Industrial development has also resulted into increased emissions and untreated effluents contributing to pollution of aquatic systems. Furthermore, increasing trade on gem minerals (mainly gold and tanzanite) has increased mining operations in Tanzania contributing to soil erosion, pollution and general land degradation. Hardwood demand for timber and other uses increases pressure on forests and is threatening the existence of some hardwood tree species like *Pterocarpus angolensis* (Mninga), *Dalbergia melanoxylon* (Mpingo); *Chlorophora excelsa* (Mvule) and *Afzelia quanzensis* (Mkongo). Furthermore, the recent growing demand for tusks and ivory in Asian markets for jewellery and ornaments has been one of the major reasons for increasing incidences of illegal hunting of wild animals,

particularly rhinos and elephants. The overexploitation of Nile perch from Lake Victoria is a result of high demand of the boom of fish factories and increase of market forces for Nile perch (URT, 2014b). Furthermore, large areas of natural forests habitats with high biodiversity including coastal and miombo woodlands are being cleared to give way to biofuel crop farming, particularly for jatropha, sugar cane and oil palm. By 2008, the total area allocated for biofuel plantations was about 650,000 hectares out of the 4 million hectares requested. Although biofuels have positive potential for greenhouse gas emission reduction, they pose potential threats to biodiversity, if appropriate measures are not taken. Land clearance, monoculture practices, use of herbicides and pesticides are some of the drivers to loss of biodiversity (URT, 2014b).

Political and social instability in neighbouring countries: For several years, there has been social unrest in some of the neighbouring countries namely Rwanda, Burundi and the Democratic Republic of Congo; stability has been restored in Rwanda and Burundi, though. This has had led to influx of refugees in the country in bordering Regions of Kigoma, Kagera and Rukwa. Land clearing for refugee campsites, construction material, wildlife, fuelwood and agricultural crop production has caused massive deforestation as well as land and other environmental degradation in and around refugee campsites. An average of 17,000 to 20 000 ha were estimated to have been depleted during 1994-1996 (URT, 2014b).

Culture and beliefs: Unsustainable land management that has strong ties with culture, traditions and beliefs are among underlying causes of biodiversity loss. The other unsustainable land management culture in Tanzania is that of farming along the river valleys, popularly known as *vinyungu, commonly practiced* along river valleys during dry season exposing the river valley to soil erosion during the rain season. This practice is common in most parts of the country, especially in the highland areas of Kilimanjaro (Pare Mountains), Tanga (Usambara Mountains) and Morogoro (Uluguru Mountains) Regions. Setting wildfires for clearing of farmlands is another example of unsustainable cultural practice. This practice is common in the miombo ecosystem (Kigoma, Mbeya, Tabora and Rukwa) and Morogoro, Lindi, Pwani, Mtwara, Ruvuma and Tanga Regions. In some parts of the country fires are started to facilitate animal hunting, as a tool for honey hunting, to eradicate tsetse flies and ticks, or to induce growth of fresh grass in rangelands. In other areas where people believe that if one sets a wildfire that ends up burning a long distance, it is an indication that he/she will live a long life, a belief that encourages people to burn forests and grassland in determining their life span, resulting in land degradation (URT, 2014b). An average of 11 million hectares are burnt annually (ranging from between 8.5 and 12.9 million hectares) across the country (URT, 2014 b).

Low level of awareness and knowledge on biodiversity related issues: Low level of knowledge and information regarding the value of biodiversity and its impact on socio-economic development is one of the main reasons behind biodiversity loss. Low level of awareness of the public on the socio-economic importance of biodiversity is to a greater extent a consequence of inadequate educational as well as targeted awareness programmes, and has subsequently influenced the public to naively participate in social behaviours and practices harmful to resources on which they depend. Furthermore,

limited capacity for research, technology and generation of accurate information and data on biodiversity limit its contribution in planning and decision making process, sometimes leading to adverse effects on biodiversity in cases where decisions made are not informed by authentic scientific findings that would otherwise incite appropriate responses.

Lack of consistent and relevant information, data and database on biodiversity: There is a general lack of reliable and relevant information and data on different aspects of biodiversity in the country. This deficiency is deterring country's efforts in halting biodiversity loss in the country. Information and data on the current state of biodiversity, in terms of which species are present at which places and in which abundance, are crucial in determining the trends, making extrapolations and future projections. Information and data on the current state of biodiversity are also useful in developing and implementing species monitoring, conservation and recovery program will provide the framework for targeted response for species that require special attention (including endemic and threatened species) to ensure their long term sustainability. Biodiversity databases are crucial components of management because they store information about biodiversity and make it digitally available.

Non-valuation of goods and ecosystems services: There is a general paucity in knowledge to the public on the actual (monetary) value of the goods and services obtained from biodiversity and associated traditional knowledge on biodiversity. This has sometimes discouraged community participation in biodiversity conservation. Economic valuation is a very important tool in encouraging community participation in support of biodiversity conservation as it reveals the tangible benefits arising from biodiversity and conservation, which can also be used to extrapolate the losses along with biodiversity loss. Economic valuation can also serve to raise awareness among policy makers or the general public of the thus far unrecognized economic benefits of conservation.

4.2.2 Climate change associated causes

The frequency of occurrence of climate extreme events (e.g. droughts, heavy precipitations and associated floods) has been increasing in Tanzania in recent years and has exerted pressure on biodiversity and ecosystems at large (URT, 2014b). Severe and recurrent droughts as a consequence of climate change are pronounced in semi-arid areas (Arusha, Dodoma, and parts of Iringa, Kilimanjaro, Manyara, Shinyanga, Singida, Mara, Tabora and Rukwa regions). Besides poor crop yields, frequent droughts in these areas have resulted in destruction of forests, leaving the land bare, making it susceptible to agents of soil erosion such as wind and water. Farmers and pastoralists in such areas are forced to migrate into virgin forests and other lands leading to further forest and land degradation in general.

Severe and prolonged drought has also resulted into declines of water levels in satellite lakes and dams, shrinkage of receiving lakes such as Lake Rukwa and Lake Victoria, and drying of some water bodies. In some areas, perennial rivers have changed to

seasonal rivers, consequently leading to shrinkage or disappearance of subsequent wetlands, with severe effects on biodiversity. The impacts of climate change is evident with large mammals particularly their population and distribution patterns. During the dry seasons large mammals especially hippopotamus, crocodiles, buffalos and elephants crowd in few remaining water ponds and there are increased losses (**Figure 4-4**).

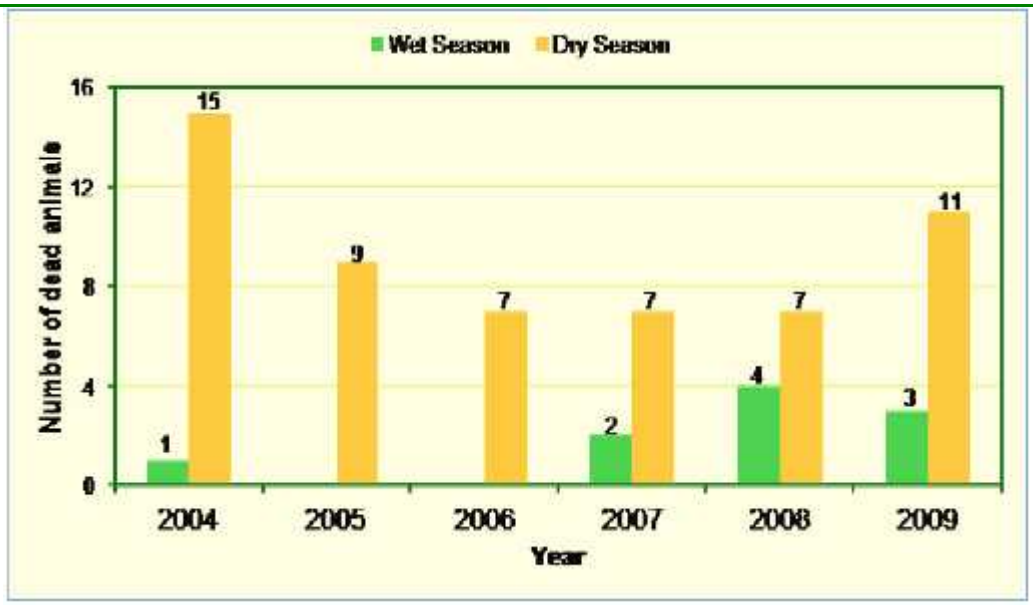

Figure 4-4: Comparison of number of dead animals counted along Katuma River between dry and wet seasons
(*URT, 2014b*)

Sporadic and intense precipitations as a result of climate change, have often led to floods leaving several hectares of land, crops and houses destroyed. Examples of such floods include the floods of 2001 in Manyara (Babati), 2006 in Kilimanjaro, 2009 in Morogoro (Kilosa) and 2010 in Dodoma (Mpwapwa). More intense rainfall and flooding could also result in increased nutrients, suspended solids and sediment yields, thus compromising the quality of surface water. These impacts coupled with rapid population growth, low adaptive capacity of the rural communities to the impacts of climate change has resulted into unsustainable resource use that in turn negatively affects biodiversity (URT, 2014b).

4.2.3 Inadequate Policy, Legal and Institutional Response

The national policy and legal framework for biodiversity protection has made some progress in recent years, however, a lot need to be done in order to reverse the declining trends in biodiversity. Harmonization and synergy between policy processes is needed even between those that are closely related. Despite significant efforts in revision of some policies and adopting relevant legislation, the successful implementation of these instruments is greatly hampered by several constraining factors, which include:

i) *Delays in ratification of multilateral environmental agreements:* This includes delays in the ratification of the ABS Protocol and the Nagoya Kuala Lumpur Supplementary Protocol for damages from the movement of living modified organisms.

ii) *Inadequate and obsolete legislation*: Out dated policies and laws and several instruments including the Environmental Policy of 1997, National Land Policy of 1995, National Forest Policy of 1998 and Fisheries Sector Policy and Strategy Statement of 1997. Emerging issues such as invasive species, biotechnology, nanotechnology, synthetic biology among others are not adequately addressed.

iii) *Inadequate enforcement and compliance to relevant laws and regulations*: Despite the existence of policies and laws governing forest resources, the challenge has been inadequate enforcement and compliance to these instruments. This is mainly due to inadequate capacity, in terms of personnel and financial resources.

iv) *Inadequate sector integration*: Inadequate involvement and participation of private sector and public at large resulted into weak implementation of 2001 NBSAP.

v) *Inadequate stakeholders' participation and gender consideration*: There exists significant involvement of the development partners, international and national NGOs in biodiversity conservation through various interventions, mostly focusing on particular thematic areas. There is however inadequate community involvement and empowerment; including gender consideration - in planning and decision-making as it regards management of biodiversity. According to Census 2012, women constitute about 51% of the total population. They also constitute the largest workforce in the agricultural sector, with the rural women largely depending on biodiversity for their household livelihoods. Currently, planning and decision making processes in biodiversity related issues do not adequately address gender issues, especially priorities and needs of women, resulting into serious deterrent of biodiversity conservation efforts. This constitutes a disincentive for the conservation and sustainable use of biodiversity by women who make up the larger part of the population.

vi) *Inadequate funding of biodiversity*: Inadequate funding for biodiversity components (such as research, institutional capacity building, implementation and enforcement) is one of the drawbacks in successful implementation of various initiatives geared to halting biodiversity loss, and has been identified as one of the handicap in the implementation of 2001 NBSAP. Government subventions for environmental issues including biodiversity have been highly inadequate. Funding for biodiversity should be put high on national agenda and requires further commitment of all key stakeholders and cooperation of development partners in order to fully implement all the priority actions identified for each biodiversity component in the current NBSAP.

4.3 Impacts of Changes in Biodiversity

Biodiversity is an integral part of the ecosystem and it underpins all human life and activities. The goods and services that biodiversity provides are vital to sustaining well-being, and for furthering socio-economic development. Loss of biodiversity due to anthropogenic activities results in altered capacity of healthy ecosystems to deliver this wide range of goods and services.

4.3.1 Impacts on ecological environment

Impacts on ecosystems include changes in sceneries in different parts of the country as a result of deforestation and mining activities. Continuing land degradation in semi-arid areas which is further being complicated by overgrazing, has in some places resulted into semi-desert lands. Examples of affected areas include Dodoma, Shinyanga, Singida, parts of Kilimanjaro and Manyara Regions (URT, 2014b).

Ecological impacts such as habitat loss, fragmentation and degradation result in the disruption of ecosystem functioning and consequence loss of feeding and nursery grounds of certain species, which can further threaten existence of some species. Marine species such as turtles and dugongs are declining due to loss of habitats. Logging of the most valuable timber species such as *Milicia excelsa* (Mvule), *Pterocarpus angolensis* (Mninga) and *Dalbergia melanoxylon* (Mpingo) has led to threatening of such species to extinction. In Lake Victoria, the introduced Nile perch has led to significant decline in endemic haplochromine species, some to extinction (URT 2014b).

4.3.2 Impacts on human well-being

i) *Food insecurity*: Land degradation has resulted in decline or loss of land productivity and consequent poor harvests due to reduction or depletion of soil nutrients. Coupled with extreme events such as drought and floods, land degradation has led to recurring food shortage in some areas (URT, 2014b).

ii) *Economic loss:* Reduced water flows due to deforestation, for example, has subsequently resulted in interrupted power generation in hydroelectric schemes such as Mtera and Kihansi. Economic costs associated with unreliable power supply have been estimated at about US$ 330 million for 2006 representing about 2 per cent of GDP (World Bank, 2006). The economic losses emanating from water pollution are also significant since degraded aquatic system limits usage of water and sometimes require water treatment, which is a costly undertaking. It is estimated that impacts resulting from poor sanitation and hygiene cost the country about USD 206 million per year or equivalent to 1% of annual GDP. This translates to an average of USD 5 per capita annually (SWA, 2012). Equally important are losses of revenue emanating from lost tourism and recreation opportunities as a result of polluted beaches, and due to illegal activities such as poaching, illegal logging and illegal fishing, and associated

conservation costs to combat these activities. Economic losses may have more severe effects at household level especially in poor communities, which depend solely on biodiversity for their livelihood. Available data indicate that at some localities e.g. Nyumba ya Mungu, 92% to 95% of the households derive their income and food from the wetland resources (Halima and Munishi, 2009).

iii) *Water scarcity*: While severe droughts have lead to increased water scarcity due to drying of water bodies, pollution of aquatic systems from both industrial/mining operations and agricultural practices limits availability of portable water. Some of rivers (e.g Msimbazi and Mirongo Rivers) are no longer capable of providing either water to the populations living along its banks or of providing a suitable environment for its own aquatic life (URT, 2014b). Increased inaccessibility of water to the population due to water quality deterioration inflict the burden on distance and time spent by mostly women and children to collect water for domestic uses, thereby reducing their time available for productive economic activities for adults as well as school attendance for children.

iv) *Migrations and land conflicts*: Poor land productivity as a result of excessive land degradation and recurring droughts especially in semi-arid areas such as Shinyanga, Dodoma and Manyara has triggered migrations of people and their livestock in search for productive land, fodder and water, often to agriculture production areas. This has resulted into farmers-livestock keepers conflicts, in various places of the country such as Rufiji (Pwani Region), Kilosa and Kilombero (Morogoro Region) and Mbarali (Mbeya Region). Conflicts over water resources between pastoralists and farmers have become a common phenomenon in Morogoro, Kilimanjaro and Mara regions (URT, 2014b).

CHAPTER FIVE

POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

The Tanzania Development Vision (TDV) 2025 articulates the desirable future and road map to be taken for the nation to graduate from a developing country to a middle-income country. Tanzania attributes a high quality livelihood; a well-educated society; peace, stability and unity; good governance and the rule of law and unity and strong and a competitive economy as being prerequisite for attaining its vision. Biodiversity conservation is implied in sustainable attainment of the vision.

The United Republic of Tanzania is comprised of the mainland and Zanzibar the latter state having its own vision 2020, aimed at eradicating abject poverty by the year stipulated in six broad objectives; a diverse economy for transformation to semi-industrialisation; an enabling development environment; a peaceful society; a healthy society; good governance and capacity building and stability. As with the TDV 2025, Zanzibar 2020 requires comprehensive strategies to realize priorities for biodiversity conservation.

Tanzania has undertaken measures to ensure sustainable conservation of biodiversity demonstrated by the signing of the Convention of Biological Diversity (CBD) and other International Agreements. At national level development and implementation of the 2001 National Biodiversity Strategy and Action Plan (NBSAP) (URT, 2001), relevant and complement policies and legislation such as environment, climate change, land and water management ensure sustainable biodiversity conservation. The Vice President's Office, Division of the environment (VPO-DoE) is mandated to coordinate biodiversity conservation in country and has the mandated to enforce implementation of various strategies, guidelines policies and legislation in collaboration with other Sectors.

5.1 Policies

Tanzania has several policies that address matters of biodiversity but none that is stand-alone policy for conservation and sustainable use. Matters of biodiversity are dealt with in sector specific policies implicitly.

a) National Environmental Policy, 1997

The National Environmental Policy (NEP) of 1997 recognizes that development is a sustainable if it takes place within nature's tolerance limits, both in the short and in the longer-term. The policy seeks to provide the framework for making fundamental changes that are needed to bring environmental considerations into the mainstream of decision-making in Tanzania. Appendix 2 presents some of the sectors objectives that are in congruence with biodiversity management.

b) National Environmental Policy for Zanzibar, 2014

The primary objective of the NEPZ is to protect and manage the country's environmental assets including biodiversity, such that their capacity to sustain development is unimpaired and Zanzibar's rich environmental endowment is available for future generations to enjoy and use wisely.

c) National Land Policy, 1995

One of the objectives of the Land Policy is to protect land resources from degradation for sustainable development. The policy statements address the following areas: protection of sensitive areas; village land demarcation; unplanned settlements; protection of public open spaces and other urban land for public use; urban agriculture; village land use planning; conflict in land uses; overlapping land use areas (pastoralism and wildlife); coastline land use; and protection of fragile and sensitive lands and issues several statements to enforce this.

d) National Human Settlement Policy, 2000

Environmental protection is a strategic issue for human settlement development. Thus environmental planning and management ensure that settlements are habitable and sustainable.

e) National Forestry Policy, 1998

To enhance ecosystem conservation and management by ensuring ecosystem stability through conservation of forest biodiversity, water catchments and soil fertility is a key objective of the forestry policy. The policy emphasises establishment of new reserves; conservation and management that involves local communities and other stakeholders; dissemination and Environmental Impact Assessment (EIA) for investments, which convert forestland to other land use or may cause potential damage to forest environment.

f) Zanzibar Forest Policy, 1999

The policy emphasizes social, economic and environmental dimensions of alleviating poverty and increasing equity in resource management and utilization; promoting economic development, access to forest products, creating income and increasing national revenues efficiently; and protection and conservation of forest resources including wildlife and flora, and enhancing the role of forest resources in maintaining soil and water conservation and other environmental benefits.

g) National Wildlife Policy, 2007

The objectives of the National Wildlife Policy among others focus on wildlife protection and conservation in order to ensure sustainability of wildlife ecosystems.

h) National Tourism Policy, 1999

The policy acknowledges the relationship between the environment and development of sustainable tourism. Thus the aim is to ensure that development of tourism is based on careful assessment of carrying capacities of tourism products and ensures enhancement and improvement of special environment features.

i) Zanzibar Tourism Development Policy, 1997

The Zanzibar Tourism Development Policy aims to elaborate, taking into account Zanzibar own reality and vision 2020, a framework of reference, which will permit the establishment of a sustainable, quality and diversified utilisation of the sectors potential while protecting the environment, culture and traditions.

j) National Transport Policy, 2003

One of the objectives of the Policy is to develop safe, reliable, effective, efficient and fully integrated transport infrastructure. The Policy emphasizes on the need to facilitate sustainable development by ensuring that all aspects of environment protection and management are given sufficient emphasis at the design and development stages of transport infrastructure and when providing service.

k) Beekeeping Policy, 1998

The objective of the Policy is to improve biodiversity, increase employment, and foreign exchange earnings through sustainable bee products based, industrial development and trade. It also ensures ecosystem stability by practising Integrated Pest Management and carrying out Environmental Impact Assessment (EIA) for investments inside or around bee reserves.

l) Fisheries Sector Policy and Strategy Statement, 1997

The National Fisheries Sector Policy and Strategy Statement adopted in 1997 focuses on the promotion of sustainable exploitation, utilization and marketing to provide food, income, employment foreign exchange earnings and effective protection of the aquatic environment to sustain development. This policy explicitly mentions biodiversity management, addressing direct concerns on biodiversity.

m) National Agriculture Policy, 2013

The National Agriculture Policy, 2013, aims at addressing challenges that continue to hinder the development of the agricultural sector. Among the agricultural development constraints and challenges that are associated with biodiversity (agro-diversity) management are crop pests and diseases and erosion of natural resource base and environmental degradation. The policy also recognises bio-fuel crops that often require large portions of land to be cleared for bio-fuel production and that such conversion

could result into the destruction of biodiversity and the environment at large, unless the habitat is managed in a sustainable manner alongside the bio-fuel crop production.

n) Zanzibar Agriculture Sector Policy, 2002

The policy aims at promoting agricultural transformation from a predominantly rural-based subsistence to a modern commercial sector. The Policy does not draw reference to biodiversity but it is implied in strategic objectives that strive to achieve sustainable use of natural resources in the sector.

o) National Livestock Policy, 2006

The livestock development policy does not explicitly mention biodiversity but implementation of the environment-related policy statements directly and indirectly address biodiversity concerns because a well-managed environment will tend to maintain a considerable proportion of its components.

p) National Food Security Policy, 1996

The National Food Security Policy recognizes food availability, accessibility and utilization as three major pillars of food security. While the policy does not explicitly address biodiversity, the concern on pests and diseases, which have influence on biodiversity, especially in agro-biodiversity, as well as concerns on other climate change issues such as floods and drought which have significant impact on biodiversity, indicates that the policy indirectly underscores some issues relevant to biodiversity.

q) National Science and Technology Policy, 1996

The National Science and Technology Policy has several features of importance to biodiversity conservation. These include its focus on promoting high-level scientific research and technological manpower training with the view of inculcating the scientific and technological culture in the society; and the preservation or conservation of the environment or ecosystem in the process of industrialization and utilization of natural resources. Among the objectives of the National Science and Technology is to promote the rational utilization of natural resources, including energy resources, and environmentally sound technologies in order to maintain sustainable ecological and social balance. Implementation of this policy is aligned with other sectoral policies.

r) National Energy Policy, 2003

The overall policy in the energy sector aims to ensure adequate and sustained energy supplies for continued economic growth and development. The energy policy places emphasis on development and efficient utilization of indigenous energy resources and self-reliance in energy science and technologies. The National Energy Policy adopts the National Environmental Policy, 1997 as its framework for environmental management.

s) Zanzibar Energy Policy, 2009

Access to reliable supplies of energy is a prerequisite for development and prosperity of the people of Zanzibar. The policy aims to meet energy needs of the Zanzibar population for social and economic development in an environmentally sustainable manner.

t) National Water Policy, 2002

The objective of the water policy among others is to have in place a water management system, which protects the environment, ecological systems and biodiversity. The objectives include ensuring quantity and quality water for both surface and groundwater resources based on scientific information available considering both the temporal and spatial water requirements to maintain the health and viability of riverine and estuary ecosystems and associated flora and fauna; and use of environmentally friendly raw materials with less-toxic elements and adapt cleaner production technologies.

u) National Water Policy for Zanzibar, 2004

The objective of the Policy is to provide guidance to enable Zanzibar achieve provision of access to clean and safe water for all people and other water users responding to the needs of expanding social and economic activities while considering the nature conservation.

v) Education Sector Policies

The Education Sector policies in the URT include the Education and Training Policy (1995), The Education Policy for Zanzibar, (1991), the Science and Technology Policy (1996), and the National Higher Education Policy (1999). The overall goal of education sector is to ensure quality, access and equity at all levels of education. These Education policies are in line with the larger national or macro-policy which emphasizes, inter alia, increased role of private sector in education, introduction of cost sharing measures, and decentralization of education and training management. Biodiversity has been mainstreamed into education sector, however, more emphasis is needed to review curricula and integrate appropriate biodiversity knowledge.

w) Other related Sector Policies

Several other policies influence conservation and sustainable use of biodiversity by promotion of activities that rely on and potentially negatively this valuable resource. Such policies include the Construction industry policy, (2003), the Tanzania Natural Gas policy, (2013), the Sustainable industrial development policy, (1996) and the Gender policy of 2002.

5.2 Legislation

Similar to the policy framework, there is no piece of legislation dedicated to only biodiversity. The positioning of the national focal points for environment, biodiversity, climate change all under the ministry responsible for environment serves to ensure that the legislation provide the mandate to oversee coordination of environment conservation and protection.

The Environmental Management Act No. 20 of 2004

The Environmental Management Act No.20 of 2004 provides both legal and institutional framework for the sustainable management of the environment, prevention and control of pollution, waste management, environmental quality standards, public participation, environmental compliance and enforcement. The Act establishes the Environmental Appeals Tribunal, National Environmental Trust Fund and National Environmental Advisory Committee.

It requires the undertaking of Environmental Impact Assessments (EIA) and Strategic Environmental Assessment (SEA) for investment projects and programmes respectively. It further emphasises the need for research, public participation in environmental decision-making, environmental awareness, and dissemination of environmental information (URT, 2004).

a) The Zanzibar Environmental Management Act No. 3 of 2015

The Act repeals the Environmental management for sustainable development Act 1996 for Zanzibar, which was established to ensure sustainable use of the environment. The revised Act leverages the premises of the repealed Act by inclusion of an authority with a board of governance and unit's management of climate change, EIA and SEA, among others. Being a small island state, the Act makes special provisions for coastal management whereby biodiversity conservation is emphasised due to the significance of the resource for social well being and economic wealth of the state.

b) The National Parks Act No. 11 of 2003

The National Parks Act of 2003 stipulates the management of National parks through a board of trustees and their responsibilities and the role of the Minister for Natural Resources and Tourism to ensure protection and promotion of the biodiversity rich areas.

c) The Village Land Act No. 4 of 1999

The Land Act No. 4 of 1999 as amended in 2004 forms the principal Act guiding land matters in the country. The current Acts divide land into public land (Village land), reserved land (land set aside for conservation e.g. National Parks etc.) and hazardous land (that poses danger if developed e.g. 60 m from rivers, mangroves, and so on). The

act makes no specific reference to biodiversity but the protective measure afforded to the various land types implies inclusion.

d) The Land Tenure Act No. 12 of 1992 for Zanzibar

The Land Tenure Act 1992 section IV emphasises the ownership of trees. The Act gives rights to ownership by inheritance and or sale in rural settings whilst ensuring protection of urban trees as a public good.

e) The Local Government (Urban Authorities) Act No. 8 of 1982

This Act assigns responsibility to Urban Authorities the administration of day-to-day activities of taking measures for conservation of natural resources, safeguard and promote public health.

f) Zanzibar Legislation for Local Government

The following instruments ensure local government administration on the isles:

- Article 128 contained in Chapter 12, Section 2 of the 1984 Constitution of Zanzibar;
- Act number 1 of 1998 – The Regional Administration Authority Act,
- Act number 3 of 1995 – Act to Establish the Zanzibar Municipal Council and Other Matters Connected therewith,
- Act number 4 of 1995 – Act to establish the District and Town Councils and other matters connected therewith

g) Water Resource Management Act No. 11 of 2009

The Act provides for pollution control and issues discharge permits of effluents to water bodies including the underground strata according to Environmental Quality Regulations provided under EMA No.20 of 2004. The Act provides measures for flood mitigation and control for the purpose of preventing or minimising the risk of flooding, flood damage and water pollution by prohibiting the construction on submersible lands of dikes, levees or other structures which will likely hinder the runoff of flood water (URT, 2009b).

h) The Public Health Act No. 1 of 2009

The Act prohibits discharges into a sewer or into drain that may cause malfunctioning of the drainage systems and cause pollution of aquatic biodiversity in addition to causing health hazards. These include solid waste, chemical waste and hot liquids.

i) The Occupation Health and Safety Act No. 5 of 2003

The Act deals with the protection of human health from occupational hazards, indirectly addressing biodiversity. The act also provide for the protection of persons other than

those at work against hazards to health and safety arising out of or in connection with activities of persons at work. The Act requires companies or institutions to provide safety gears to those working at risk areas (URT, 2003c). The company/institutions also run mandatory regular health checks for its employees.

j) The Merchant Shipping Act No. 21 of 2003

The Act, among others, provides for the prevention of marine pollution by oil, hazardous waste, noxious liquid, sewage, toxic waste, garbage and other substances and the protection of the marine environment.

k) The National Wildlife Conservation Act No. 5 of 2009

The Act is responsible for the conservation of wildlife and ensures protection, management and sustainable utilization of wildlife resources, habitat, ecosystem and the non-living environment supporting such resources, habitat or ecosystem with actual or potential use or value.

l) The Grazing-land and Animal Feed Resources Act No. 13 of 2010

The Act provides for the management and control of grazing-lands, animal feed resources and trade as well as provision for other related matters. The Act further gives mandate to the Local Government Authority in relation to soil conservation, prevention of adverse effects to soil and soil erosion in a grazing-land, rehabilitation, protection or improvement of the grazing-land, make by-laws on clearing of land for the purpose of cultivation of crops other than animal feed; use of implements or machinery; introduction or removal of flora or fauna; gathering of natural produce; introduction, grazing, watering or movement of stock and other domestic animals; husbandry practices of grazing-land; and construction of infrastructures.

m) The Road Act No.13 of 2007

The Act, among others, provides for protection of environment. It states that the road authority entrusted with the duties of developing, managing and maintaining public roads under its jurisdiction, shall comply with the prescribed guidelines, regulations relating to environmental protection and waste disposal which stipulate conditions for clearance of biodiversity rich areas and indigenous and or threatened species.

n) The Mining Act No 14, 2010

The Act provides for regulation of prospecting for minerals, mining, processing and dealing in minerals. The Act requires all holders of mining licenses to take appropriate measures for the protection of the environment in accordance with the Environmental Management Act including undertaking EIA in mining activities. Similar to the roads clearance of conservation worthy areas is to be considered carefully when conducting mining activities.

o) The Fisheries Act No. 22 of 2003

The Act regulates fishing activities in both fresh and marine waters. Among others, it emphasises on the conservation of critical habitats or endangered species, and restricts the issuance of fishing licences for fishing in any conserved areas.

p) The Forest Act No. 14 of 2002

Among others, the main objectives of this Act is to ensure ecosystem stability through conservation of forest biodiversity, water catchments and soil fertility; promote and enhance the contribution of the forest sector to the sustainable development of Tanzania and the conservation and management of natural resources for the benefit of present and future generations.

q) The Plant Protection Act No. 13 of 1997

The Act is responsible for prevention of the introduction and spread of harmful organisms, ensure sustainable plant and environmental protection, to control the importation and use of plant protection substances, to regulate export and imports of plants and plant products and ensure the fulfilment of international commitments, to entrust all plant protection regulatory functions to the Government, and for matters incidental thereto or connected therewith.

r) The Seeds Act No. 18 of 2003

The Act provides for the control and regulation of the standards for agricultural seeds and for matters incidental thereto and therewith.

s) The Marine Parks and Reserves Act No. 29 of 1994

The Act provides for the establishment, management and monitoring of marine parks and reserves, to establish a marine park and reserves unit and to repeal certain existing legislation.

t) *The Zanzibar Tourism Act No. 6 of 2009 as amended*

The Act places emphasis on the business operations of tourist facilities, i.e. accommodation, health and safety standards, and so on with little reference to protection of biodiversity though the policy advocates for eco-tourism. Clause 76 is the only section where reference to protection of a specific species i.e. dolphins is made.

u) The Plant Breeders Right Act No. 1 of 2013

The Act provides for the establishment of a registry of plant breeders rights, promotion of plant breeding and facilitation of agricultural advancements through the grants and

regulation of plant breeders rights. The Act provides for matters of genetic resources in connection to breeding.

5.3 Other Supporting Documents

a) Strategy on Urgent Actions on Land degradation and water catchments, 2006

This strategy addresses environmental degradation particularly of land and water catchments, and environmental concerns that result from unsustainable agricultural activities in water catchments, on mountaintops, mountain slopes and in other fragile ecosystems. The Strategy identifies twelve areas of concern to halt degradation and promote biodiversity conservation and sustainable use of land and water resources that host biodiversity ecosystems.

b) National Adaptation Programme of Action, 2007

The overall vision of Tanzania's NAPA is to identify immediate and urgent climate change adaptation actions that are robust enough to lead to long-term sustainable development in a changing climate, as well as to identify climate change adaptation activities that most effectively reduce the risks that a changing climate poses to sustainable development. The NAPA Framework has been formulated strategically to be in line with the Environmental Management Act, 2004, which provides clear directives towards sustainable environmental management including biodiversity in the country.

c) Strategy on Urgent Actions for the Conservation of Marine and Coastal Environment, Lakes, Rivers and Dams (2008)

This Strategy was put in place as a response towards environmental degradation in coastal environment, lakes and river ecosystems and dams. The strategy addresses among others three major challenges) Marine and Coastal Environment destruction and degradation; ii) Lakes, rivers and dams considering matters of sedimentation, mining, over-exploitation of resources and iii) Cross-cutting issues such as poverty, public awareness and participation and institutional capacity.

d) National Climate Change Strategy, 2012

The national Climate Change Strategy 2012 emphasises the need to develop the requisite expertise, governance, technological and infrastructural capacities to address aspects of climate change mitigation and adaptation, including enhancement of governance strategies and institutional arrangements.

The Strategy aims at raising awareness of the community at all levels on adaptation to the impacts of climate change. It is meant to strategically facilitate sharing of best practices on climate change mitigation and adaptation and prepares the nation, region, district, village and community to take appropriate measures in the context of

sustainable development (URT, 2012c). Biodiversity is a key component of climate change adaptation and mitigation and thus the strategy compliments initiatives that focus on biodiversity conservation and sustainable use.

e) National Environmental Action Plan, 2013-2018

The NEAP highlights the state of the environment identifying key environmental issues including Land degradation; Water resources degradation and pollution; Aquatic resources degradation; Loss of wildlife habitats and biodiversity; Deforestation; Urban pollution; Climate change; Modern biotechnology; E-waste; Invasive alien species; and Biofuels. In addition, NEAP takes into account emerging issues, which have a bearing on the environment such as climate change, Genetically Modified Organisms (GMOs), biofuels, Invasive Alien Species (IAS) and electronic waste. Furthermore, the NEAP sets targets and indicators for tracking implementation progress.

f) Tanzania Elephant Management Plan, 2010 – 2015

The Elephant Management plan developed through a consultative approach, stipulates nine objectives that aim to reduce Human-elephant conflict, loss of connectivity for elephants caused by development, and increase protection for Tanzania's elephant populations. The plan sets out targets, actions, timelines and actors for each of these objectives for the desired period. Implementing the strategy for a large mammal population that crosses protected and non-protected areas ensures associated biodiversity and sustainable use is also addressed.

5.4 Institutional Arrangement

The Ministry responsible for the Environment regulates all matters of biodiversity in Tanzania. Under the Ministers command, is the Division of the Environment (DoE), headed by a Director who is the focal point for all matters of the CBD and is also responsible to coordinate biodiversity matters with sector ministries. There is also established the National Environmental Advisory Committee (NEAC) as an advisory body to the Minister. The National Environment Management Council (NEMC) is the technical advisory, co-ordinating and regulatory agency responsible for the protection of the environmental and sustainable use of the natural resources in Tanzania. With regard to NBSAP, the CBD focal point is responsible for the preparation and monitoring of the plan. Sector ministries, government agencies and other non-state actors are responsible for implementation of the NBSAP as indicated in the action plan.

In order to effectively facilitate coordination and communication on environmental management issues that includes biodiversity, the Government has established Environmental Coordination Units in all Sector Ministries and designated Environmental Management Officers in Local Government Authorities at City, Municipality, District, Township, Ward, Village, Street and Hamlet levels. In addition, the Government has established a Special Environmental Police Unit in the Tanzania Police Force in order to strengthen enforcement of relevant laws. The existing institutional arrangement for

environmental management is provided in **Figure 5-1**.

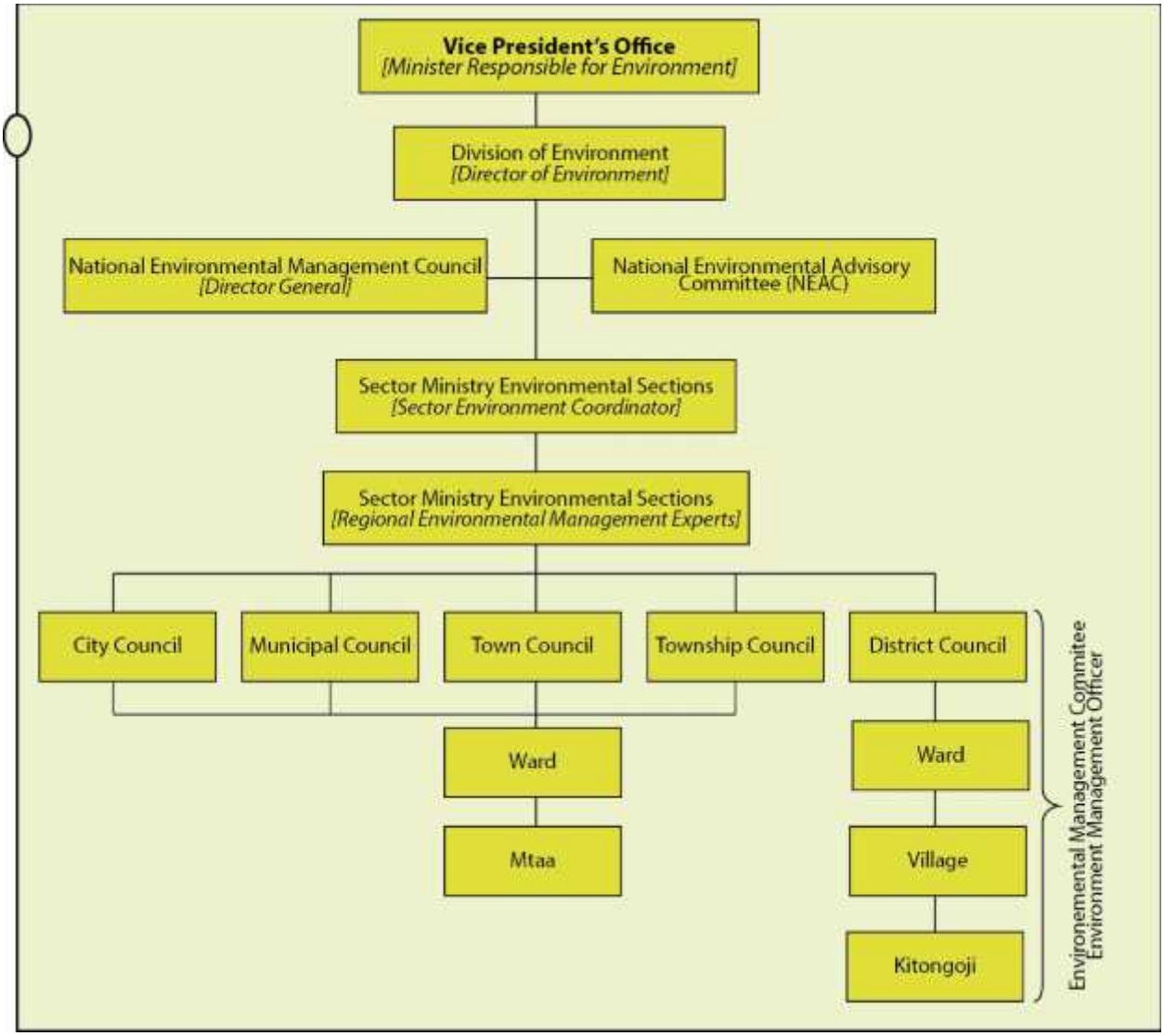

Figure 5-1: Organogram for administration of environmental matters in Tanzania

To date, despite the number of policies, legal and institutional framework put in place to support biodiversity conservation, some challenges remain.

Strengths

i) Existence of policies, laws and institutional framework;
ii) Coordination has been improved as different sector agencies participate in the Boards or Committees of the related ministries;
iii) At district level there is increased participation in local planning processes;

iv) Establishment of data and information sharing platforms – Tanzania Biodiversity Information Facility (TANBIF) at COSTECH; the environmental portal at the VPO-DoE; the Biodiversity Information Management Tool at the National Land Use Planning Commission and several sector databases;
v) Existence of dual policies for mainland Tanzania and Zanzibar enables learning and sharing of experiences and more specific of the large and diverse biodiversity resource of the country.

Challenges

i) Coordination between ministries, government agencies, the private sector and communities in development planning is still not optimal;
ii) Inadequate capacity for planning and enforcement of policy and legislation (human, financial and institutional) at community implementation levels;
iii) Sectors strategic planning frameworks, set out numerous objectives that cannot be readily achieved due to the enormous level of resources and expertise that is required;
iv) Low level of stakeholder involvement and participation in planning and decision-making;
v) Several policies and legislation, including the Environmental Policy of 1997 requires review to address emerging issues such as invasive species, biotechnology, nanotechnology, synthetic biology;
vi) Insufficient data and information about biodiversity, inadequate capacity for research and dissemination, and insufficient collaboration between institutions that manage data;
vii) Inadequate capacity and awareness for sustainable resource management;
viii) Insufficient allocation of resources for biodiversity research, management, capacity and institution building;
ix) Inadequate incentives for sustainable use of biological resources; and
x) Overlapping mandate of different legislations and authorities.

5.5 Regional and International Cooperation Related to Biodiversity Conservation

Tanzania has ratified several international agreements, conventions and protocols that relate to biodiversity conservation. The conventions ratified and actions taken by Tanzania to implement these agreements are presented in **Table 5-1**.

Table 5-1 Multilateral agreements relevant to biodiversity conservation in Tanzania

Convention Treaty	National obligations	Remarks
1. The Convention on Biological Diversity, 1992	Tanzania as mega biodiversity country has committed to sustainable development. It Requires the country to have strategic plans for conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of benefits arising from the use of genetic resources.	• Ratification - 1996 • Focal Point – VPO-DoE
2. The Cartagena Protocol on Biosafety, 2000	The agreement requires Tanzania to ensure safe use of modern biotechnology and establish mechanisms to mitigate adverse effects on biological diversity, taking also into account risks to human health.	• Ratification – 2003 • Regulations – 2009 • Focal Point – VPO-DoE • SOPs – contained research, trans-boundary movement • Established and built capacity of competent authorities (5) • Budgetary allocation for implementation of activities.
3. The Nagoya Kuala Lumpur Supplementary Protocol on Liability and Redress, 2010	Tanzania needs to provide for administrative procedures to address liability and redress for damage resulting from trans-boundary movements of LMOs	• In ratification process • Regulations – 2009, incorporate liability • Sector legislation caters for liability and redress
4. The Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), 1973	Tanzania designated the Wildlife Division of the Ministry of Tourism and Natural Resources to be the Management Authority, while the Scientific Authority is an individual scientist. Tanzania has also in the recent past conducted a thorough wildlife sector review and assessment	• Ratification – 1979 • The ministry and its institutions and NGOs like TRAFFIC run several programmes to prevent illegal trade.
5. The SADC Protocol on Wildlife Conservation and the Law of	Tanzanian biomes particularly in the south are linked to other SADC countries and wildlife cross borders freely	• Ratification – 2003

Convention Treaty	National obligations	Remarks
Enforcement, 1999	with the potential to affect the economic development and environmental are of concern. Benefits entail joint development and implementation of conservation and sustainable use strategies	
6. The World Heritage Convention, 1972	From 1979, Tanzania has submitted natural, cultural and mixed sites of outstanding importance to the common heritage of humanity to the UNESCO panel. Other sites are being evaluated.	• Ratification – 1977 • Natural (6,551,875 ha): Mount Kilimanjaro, Selous Game Reserve, Serengeti national park, • Cultural (233,696 ha): Kondoa Rock Art Sites, Kilwa Kisiwani and Songo Mnara, Stone Town • Mixed (809,440 ha): NCAA
7. The Amended Convention for the Protection, Management and Development of the Marine and Coastal environment of the Western Indian Ocean (The Nairobi Convention), 2010	Tanzania has adapted a National Integrated Coastal Environment Management Strategy in 2003. One of the strategies concerns conservation of biodiversity	• In the process of ratification
8. The Convention on Migratory Species (CMS) (Bonn Convention), 1979	There are about 160 species of Palaearctic-African migratory birds currently known in Tanzania that need to be afforded some form of conservation measure.	• Ratification - 1999
9. The Convention on wetlands of International Importance (Ramsar Convention), 1971	Tanzania has established a framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.	• Ratification – 2000 • Four sites designated under the convention: – Muyowosi – Malagarasi wetlands, Lake Natron, Kilombero Valley floodplain and Rufiji-Kilwa-Mafia Marine
10. The Agreement on the Conservation of African-Eurasian Migratory Water Birds	The Important Bird Areas in Tanzania are protected under this agreement and it provides protection for migratory birds such as the Lesser Flamingo for which	• Ratification – 1999 • National Focal Point designated in

Convention Treaty	National obligations	Remarks
(AEWA), 1999	an action plan has been developed	the Ministry of Natural Resources and Tourism – Wildlife Division
11. The Convention on sustainable management of Lake Tanganyika, 2003	Signed by the Governments of the Republic of Burundi, the Democratic Republic of Congo, the United Republic of Tanzania and the Republic of Zambia, the convention aims to address Lake Tanganyika's unique aquatic and other biological diversity and of the Lake's significance for the development of the riparian States.	• Ratification - 2004
12. The African Convention on the Conservation of Nature and Natural Resources, 1968 Revised in 2003	The revised convention boosts the commitment by African governments including Tanzania to protect the environment, ensure sustainable use of natural resources in a collective manner as part of the continent.	• Ratification - 1974
13. The United Nations Convention to Combat Desertification, 1994	Tanzania has taken measures to reduce Land that has been rampant since the late 1920s with emphasis on areas whereeconomic productivity has been significantly reduced resulting in desert-like conditions.	• Ratification – 1997 • A national coordinating body (made up of a steering committee, a technical committee, a secretariat and a focal point) have been established with several activities and budget support.
14. The United Nations Framework Convention on Climate Change, 1994	Tanzania has taken initiatives to address climate change issues including adaptation measures.	• Ratification – 1996 • Focal Point – VPO-DoE
15. The Kyoto Protocol to United Nations Framework on Climate Change, 1997	One of the initiatives in Tanzania is through REDD strategy that aims at generating billion of shillings annually from the international carbon trading markets, through conserving forests.	• Ratification – 2003

Convention Treaty	National obligations	Remarks
16. The Bamako Convention on the Ban of the Import into Africa and the Control of Trans-boundary Movements of Hazardous wastes within Africa, 1991	A legal framework and mechanisms to prohibit trade of hazardous waste and export of toxic wastes are needed to safeguard the environment particularly to developing countries	• Ratification – 1993 • Regulations – 2009 (Environmental management (solid waste management and hazardous waste management
17. The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 1998	Tanzania has conducted national consultations to identify elements and prepare a national action plan or strategy for the implementation of the Rotterdam Convention	• Ratification – 2002 • Awareness creation on health and environmental pesticides hazards through mass media, w/shops, news papers (AGENDA AND PAN (UK), Environment Incident Report Forms (EIRF) • - A national EIRF reporting system was developed
18. The Stockholm Convention on Persistent Organic Pollutants (POPs), 2001	Tanzania benefits interventions to eliminate or restrict production and use of persistent organic pollutants under the convention	• Ratification - 2004
19. The United Nations Convention on the Law of the Sea, 1958	The law guides Tanzania's rights and responsibilities on the use for business and conservation of marine resources.	• Ratification - 1985
20. Oil Pollution Preparedness Response (OPCR), 1990	Tanzania's shoreline is protected from pollution incidents under this convention. Ships and offshore units are required to adhere to pollution emergency plans strategies for prompt response	• Ratification 2006
21. The Basel Convention on the Control of Trans-boundary Movements of hazardous wastes within Africa, 1989	A legal framework and mechanisms to prohibit trade of hazardous waste and export of toxic wastes are needed to safeguard the environment	• Ratification – 1993 • Regulations – 2009 (Environmental management (solid waste management and hazardous waste management)

CHAPTER SIX

THE STRATEGY: PRINCIPLES, GOALS AND TARGETS

6.1 Vision

Consistent with Tanzania's development vision 2025 and the 2020 Aichi Biodiversity Targets, the Tanzania NBSAP Vision is:

> *"By 2025, biodiversity and ecosystems are well protected, restored and used sustainably, ecosystem functioning maintained, so that they perpetually deliver sustainable intrinsic benefits for socio-economic development."*

The vision for Tanzania is set beyond 2020 that is the Aichi target as the country envisions biodiversity conservation and sustainable use to be a driving component in national development and thus achievement of Aichi 2020 will serve to build on new targets that will further ensure sustainability for current and future generations.

6.2 Mission

"Take effective action to reduce biodiversity loss and ecosystem degradation, and long-term ecosystems functioning is ensured in order that by 2020 Tanzania's rich biodiversity is secured and contribution of biodiversity and other ecosystem services to the well-being and economic prosperity of the people is guaranteed, through capacity building, technology transfer, knowledge management, funding and mainstreaming biodiversity across government and society, and involvement of all stakeholders."

6.3 Principles Governing the Strategy

In order to achieve the stated vision and mission, and in line with the 20 Aichi Biodiversity Targets of the Strategic Plan for Biodiversity 2011–2020 (CBD, 2010), the NBSAP (2015-2020) will be guided by the following principles:

i) Address all three objectives of the Convention and take into account the 5 strategic goals of the Strategic Plan for Biodiversity 2011-2020.

ii) Highlight the sustainable contribution of biodiversity and ecosystem services to human well being (including having the basics for a good life, health, good social relations, security and freedom of choice and action), poverty eradication, and national development as well as the economic, social, cultural and other values of biodiversity.

iii) Identify and prioritize national targets in the framework of the global Aichi Targets, and the actions required to meet the targets and fulfill the objectives of the CBD at the national level. It should devise a plan of how to implement that action.

iv) Jointly develop, adopt, and own by the full range of stakeholders who may have interests, stakes or rights with regard to biodiversity.

v) Mainstream biodiversity into sectoral and cross-sectoral policies and programs.

vi) Ensure continual monitoring, evaluation, and revision, as progress is made, as conditions evolve, and lessons are learned.

6.4 Strategic Goals

The overarching goal of NBSAP (2015-2020) is to significantly improve the integrity of Tanzania's ecosystems by 2020, thereby sustainably contributing to human well being and socio-economic development of the country. NBSAP provides a strategic planning framework for conservation and sustainable use of biodiversity, as well as advocating for equitable sharing of the benefits accrued from utilization of biological resources among all social groups. It further builds on and consolidating the successful past efforts and achievements in the implementation of 2001 NBSAP.

The following five Strategic Goals for this NBSAP (2015-2020) are drawn from the Aichi Strategic Goals and the proposed targets are contextualised for national perspectives/implications in order to ensure realization of the vision and mission. The goals also considers such as gender to be addressed as a cross cutting issue for successful biodiversity conservation.

Strategic Goal A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

Rationale for Strategic Goal A: This goal seeks to provide a response to the underlying direct and indirect causes of biodiversity loss. In Tanzania, underlying causes of biodiversity loss include rapid population growth, demand for raw materials for external markets associated with economic growth, poverty, low level of awareness, along with inadequate contribution of science and technology into all biodiversity decision-making processes. Other causes are unsustainable investments in systems of production and consumption and inadequate policy, legal and institutional response measures. In order to reverse trends of biodiversity loss, an improved knowledge base through public awareness, advocacy, and sensitization is necessary. This will support adoption of science-based decision-making process, enabling policy, legal and institutional framework and promote inclusive eco-friendly investments.

Strategic Goal B. Reduce the direct pressures on biodiversity and promote sustainable use

Rational for Strategic Goal B: Major goal is to reduce direct pressures on biodiversity and promote sustainable use. A number of direct pressures on biodiversity have been identified in Tanzania including agricultural and construction activities, forest fires, illegal

fishing, overexploitation, pollution, invasive alien species and climate change. To reverse trends of these pressures that degrade and fragment ecosystems and cause loss of habitats, efficient implementation of programmes that protect and rehabilitate degraded/ threatened biomes need to be promoted. Furthermore, relevant policies, strategies and plans governing conservation and sustainable management of biological resources, pollution and invasive alien species need to be reviewed, implemented and enforced.

Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

Rationale for Strategic Goal C: This goal seeks to respond to the consequences of pressures on the ecological environment. Such impacts include habitat change, loss, and fragmentation that reduce habitat resilience as well as disruption of ecosystem stability and function. Consequently, loss of ecosystem services along with an increase in the number of threatened species, some to extinction has been reported. To address these consequences, a nation-wide biodiversity assessment to identify fragile habitats and species that require special attention (including endemic and threatened species) has been proposed. An increased coverage of marine protected areas coupled, with proper management of the existing protected areas is expected to ensure long-term sustainability of threatened species and fragile habitats. Furthermore, an enabling policy, legal and institutional framework that supports review, strengthening, implementation and enforcement related to sustainable use is addressed.

Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services

Rationale for Strategic Goal D: The goal is to respond to the consequences of biodiversity loss on human well being and socio-economic development. Such impacts include food insecurity, poverty arising from economic loss, bio-piracy, water scarcity and water-borne diseases, and resource use conflicts such as those arising from migration in search for grazing land. Benefits accrued from biodiversity and ecosystem services should contribute to conservation and poverty alleviation. In addition wealth generation through Payment for Ecosystem Services (PES) and economic valuation are important tools in encouraging community participation in support of biodiversity conservation.

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

Rationale for Strategic Goal E: The aim is to highlight the importance of participatory planning, knowledge management and capacity building for effective and sustainable management of biodiversity. It is acknowledged that there exists a wealth of traditional knowledge; innovation and practices which if safeguarded can result into sustainable utilization as well as conservation of biodiversity. Recognition and participation of indigenous and local communities in use and conservation of biodiversity will serve to

improve livelihoods and reduce costs of conservation. Inadequate capacity in biodiversity components (research, institutional capacity and compliance) and inadequate funding need to be addressed through set up of clear financial mechanisms. Financial mechanisms should involve all stakeholders including development partners to fully implement the priority actions identified in the NBSAP (2015-2020).

6.5 National Biodiversity Targets

In order to realize the strategic goals, a total of twenty National Biodiversity Targets have been developed. The CBD Strategic Plan for Biodiversity 2011-2020 and the Aichi 2020 Targets, were used as a base in setting the national targets. The developed targets provide a clear guidance towards effective biodiversity conservation in the country.

STRATEGIC GOAL A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.
Four (4) targets have been identified for the realisation of this defined strategic goal.

***TARGET 1*: By 2020 at least 60% of the population is aware of the importance of biodiversity and its impact on human well being and socio-economic development of the country**

Low level of knowledge and information regarding importance of biodiversity and its impact on socio-economic development is one of the main reasons behind biodiversity loss. In order to redress this situation public awareness, advocacy and sensitization on biodiversity issues to the public is a critical approach to improve knowledge on the value, the causes and consequences of biodiversity loss. Campaigns aimed at promoting behaviour change should include a wide range of actors in educational establishments, media, and literature, decentralised authorities, national and sector level decision makers, academic institutions, Private sector, NGOs, CBOs and local communities.

***TARGET 2*: By 2020, Programmes for the valuation of biodiversity and payments for ecosystem services developed and integrated into national and local development strategies and plans.**

Among the underlying causes of biodiversity loss in Tanzania is the limited knowledge on the actual (monetary) value of the goods and services obtained as well as lack of tangible benefits arising from conservation. Consequently this has sometimes discouraged investment and community participation in conservation and resulted in un-informed decision-making. To improve the situation there is a need to have different programme and projects for valuating the biodiversity and enforce the payment system for ecosystem services. This will help the public to appreciate the value for biodiversity as well as its management. Furthermore biodiversity values should be integrated in the national accounting and reporting system so that its contribution could be appreciated. More attention will be given to generating information through applied research targeted

at illuminating the values of biodiversity including their economic and ecosystem values, the extent to which biodiversity can contribute to socio-economic development. Another important intervention is the establishment and implementation of compensation mechanism to benefit from efforts made within conservation framework in ecosystems and capacity building on biodiversity and ecosystem valuation.

***TARGET 3*: By 2020, incentives harmful to biodiversity are eliminated, phased out or reformed and positive incentives conservation and sustainable use of biodiversity are developed and applied.**

Incentives harmful to biodiversity mostly emanate from policies or practices that induce unsustainable behavior that is harmful to biodiversity, often as unanticipated (and unintended) side effects of policies designed to attain other objectives. The assessment of incentives (including subsidies) and their effects should not just address environmentally harmful effects, but rather take a multi-criteria, holistic approach, which should also include the cost-effectiveness and the social effects of subsidies. In order to achieve this, careful analysis of available data on incentives and enhanced transparency on the amounts and the distribution of harmful incentives is required. Successful conservation of biodiversity, however, requires elimination of all harmful incentives, and establishment of biodiversity friendly incentives along with policy reforms.

***TARGET 4*: By 2020 investments in systems of production and consumption based on sustainable eco-friendly practices increased.**

The country has put effort in making systems for sustainable consumption and production such as National Programme on Sustainable Consumption and Production; implementation of sustainable cities programme; since 2004 a total of 37 local industries and institutions have switched to natural gas and alternative energy sources (biogas, wind and solar) and efficient cooking stoves are being promoted in an attempt to curb massive deforestation since more than 90% of energy consumption constitute national biomass energy. Focus will be given to strengthen enforcement of legislation related to investments and utilization of biodiversity resource; promote enterprises using eco-friendly production and consumption methods; efficient charcoal production; alternative energy sources such as solar, natural gas and wind, etc.; energy efficient technologies; sustainable use of plant and animal resources; water use efficiency; and strengthen enforcement Public Private Partnership (PPP).

STRATEGIC GOAL B. Reduce the direct pressures on biodiversity and promote sustainable use

Six (6) targets have been identified for the realisation of this defined strategic goal.

***TARGET 5*: By 2020, the rate of degradation and fragmentation of ecosystems and the loss of habitats is significantly reduced**

Tanzania has lost about 38% of its forest cover at an annual rate of about 372,816 hectares (NAFORMA, 2015) and 61% of the country is being degraded due to demographic and economic pressures (URT, 2014). Some initiatives are on going to revert the situation such as tree planting campaign whereby each district is required to plant and maintain at least 1.5 million trees per year; promotion of alternative energy sources to help curb massive deforestation since more than 90% of national energy consumption depend on biomass energy (fuel wood and charcoal). As well as traditional forest management practices are being promoted which involve fallowing the land for a period of time and then utilizing later for grazing and firewood collection particularly during dry seasons. The priority here is habitats that are under serious threats of degradation and require protection such as forests, mangroves and wetlands. Threats of degradation in non-protected areas equally need to be addressed. Reducing the rate of degradation necessitates for promotion and support of effective land use planning as well as strengthening and implementation of appropriate policies, strategies and plans.

TARGET 6: By 2020, at least three Legislations that govern exploitation of aquatic and associated terrestrial resources are reviewed and enforced.

Overexploitation of aquatic resources as well as illegal harvesting methods including blast fishing are among the major causes of habitat degradation and biodiversity loss in Tanzania, and has resulted in significant decline in ecosystem goods (e.g. fisheries resources) and services from the aquatic systems. Overexploitation and illegal fishing is threatening the existence of some species (e.g. sea turtles and dugongs) in aquatic systems. Redressing this problem requires strengthening and implementation of appropriate policies, strategies that promote conservation and sustainable use of aquatic resources.

TARGET 7. By 2020, biodiversity and agriculture related policies, laws and strategies promote sustainable management of forest, agricultural and aquaculture ecosystems.

Agricultural expansion coupled with unsustainable agricultural practices and grazing pressure has led to fragmentation of natural habitats and consequent biodiversity loss in Tanzania. This situation can be redressed through implementation of the existing policies, strategies and plans for biodiversity and agriculture, promotion of sustainable agricultural practices and rangeland resource management as well as through strengthening and enforcement of land tenure systems.

TARGET 8: By 2020, all forms of pollution from water and land-based activities are brought to levels that are non-detrimental to biodiversity ecosystem functions.

Pollution originating from domestic, industrial, agricultural and mining activities has been identified as one of the important threats to Tanzania's biodiversity. Preventing pollution and its effects on biodiversity is a priority to the country given the current development prospects in both land and coastal and marine environments. Preventive approach

would include strengthening of the policy, legislation, and strategies and plans related to environmental pollution and their implementation. Of particular importance is the enforcement of Environmental Management Act (EMA) of 2004 that requires for the conduct of EIAs for all development projects. Equally important are the development and implementation of the national waste management strategy and action plan, promotion of liquid waste management and strengthening of monitoring programmes.

***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 prevent their introduction and establishment.*

The spread of Invasive Alien Species (IAS) is now acknowledged as one major threat to biodiversity in the world and Tanzania in particular, where over 60 invasive species have been reported. Preventive approach for their introduction and establishment include strengthening phyto-sanitary inspection at entry points, and promotion of the application of Integrated Pest Management. Preventive measures also require the review and implementation of relevant national policies and legislation to address issues of IAS, inventory of IAS and establishment of monitoring programmes and reporting.

***TARGET 10**: By 2020, the multiple anthropogenic pressure on coral reef, and vulnerable ecosystems impacted by climatic change are minimized.*

The negative impacts of climate change and variability on coral reefs and other ecosystems is vivid in Tanzania. Therefore actions that reduces the negative impacts of climate change and variability, on coral reefs and other vulnerable need to be put in place. This can be achieved through strengthening fisheries management along coral reefs and closely associated ecosystems, by assessing and manage land-based and sea-based sources of pollution, by integrating and implementing watershed and marine management, manage coastal development, building capacity for institutions and human dealing with the management of coral reefs and its closely associated ecosystem.

STRATEGIC GOAL C. To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

Three (3) targets have been identified for the realisation of this defined strategic goal.

***TARGET 11**: By 2020, area covered under marine protected areas be increased from 6.5% to 10% and effectively manage the existing terrestrial and marine protected areas.*

About 40% of the total land area has been designated as forest and wildlife protected areas exceeding the international target of 17% (2020 Aichi Targets). However, marine protected area is lagging behind. The plan for Government is to gradually expand these areas to attain the set national target that is 10% by the year 2020. Programme for the

sustainable management of the existing protected areas; restoration of degraded protected areas is of high importance. Therefore the focus will be given to enforcement of legislation and implement appropriate policies, plans and strategies aimed at managing protected areas; re-examine the entire protected area network in Tanzania for long term sustainability; promote and strengthen terrestrial and marine protected regional Cooperation on protection and conservation of wild habitats; strengthen control measures on poaching, illegal harvesting of natural forest and marine resources; enhanced institutional, research and human capacity on the management of protected areas such as the coral reef task force (CRTF).

***TARGET 12**: By 2020, species that require special attention are identified and managed for long-term sustainability in a nationwide biodiversity assessment.*

One of the significant hurdles encountered during compilation of these reports was lack of consistent data on different components of biodiversity, which represent a serious gap in the successful management of biodiversity in the country. Carrying out inventories and conducting assessments to set baselines against which monitoring can be carried out to determine the state of biodiversity and highlight trends is of paramount importance. Inventories will also help to identify species that require special attention e.g. threatened species, and the establishment of the National Red data Book especially when considering that the number of threatened species in the country is increasing. Also important is the development and implementation of species monitoring, conservation and recovery program for endangered and threatened species.

***TARGET 13**: By 2020, strategies to reduce genetic erosion developed and implemented to maintain genetic diversity of cultivated plants, farmed and domesticated animals and their wild relatives.*

Genetic diversity seems to be declining in natural ecosystems as well as in agricultural and livestock production systems. The extent of such decline and its overall impact has not been documented. Comparatively, significant progress has been made for *ex situ* conservation of plant and crop genetic resources than for livestock. Therefore priority will be given to the programme, projects and activities that will maintain genetic diversity but reduce genetic erosion. Establishment of inventory and management plan of threatened genetic species of cultivated plants, and farmed and domesticated animals including their wild relatives, non-timber forest products; establishment and strengthening of gene banks; and strengthening the implementation of policies and legislation related to safe use of modern biotechnology are considered as key steps towards protecting genetic diversity of species in the country.

STRATEGIC GOAL D. Enhance the benefits to all from biodiversity and ecosystem services

Two (2) targets have been identified for the realisation of this defined strategic goal.

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

Different ecosystems have continued to provide essential services to the human beings together with other creatures. But due to the population increase and demand for different activities like agriculture, livestock keeping, constructions etc. These ecosystems have been deteriorating time after time. The aim of this target is to make sure different ecosystems are restored and safeguarded by taking consideration the need of women, local and vulnerable communities. To achieve this target the following will have been identified as priority actions; development/ strengthening of management programmes for major watersheds, protection and restoration of coral reefs and mangroves, compiling and inclusively avail information on the services and the benefits provided by ecosystems received to local communities, establish changes in ecosystem services of key habitats caused by anthropogenic activities and identification of the affected parties and formulation, strengthening and implementation of monitoring programmes for key habitats that provide ecosystem services.

TARGET 15: ***By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, thereby contributing to climate change mitigation and adaptation and to combating desertification.***

This target seeks to ensure that national level compensation mechanisms benefit from efforts made within the conservation framework. This calls for mechanisms for the payment of carbon stocks and other conservation initiatives to be put in place with pilots initiatives in the ecosystems generating income for its wide beneficiaries, promotion and encouragement of additional voluntary payment mechanisms for utilization of biological and genetic resources by the business sector, review/ enforce relevant policies, plans and strategies to curb negative impacts of climate change on biodiversity and desertification

TARGET 16: **By 2020,** ***Fair and Equitable Benefit Sharing arising from utilization of biodiversity resource is in force and operational, consistent with national and international legislation.***

In order to prevent the misappropriation of genetic resources and to ensure fair and equitable sharing of genetic resource with holders of the resources – ratification of the Nagoya Protocol is crucial. Nagoya Protocol will provide greater legal certainty and transparency for both providers and users of genetic resources, creating a framework that promotes the use of genetic resources and associated traditional knowledge while strengthening the opportunities for fair and equitable sharing of benefits arising from their use. Along with ratification of the protocol, the following need to be done. Establishment, implementation and enforcement of legislation, policy, guidelines and a communication strategy for Access and Benefit Sharing (ABS), and the development

and implementation of the national ABS framework and protocols. Also important is the promotion public awareness on ABS related issues and international cooperation to ensure that Tanzania benefits from transfer of its genetic resources.

STRATEGIC GOAL E. Enhance implementation through participatory planning, knowledge management and capacity building

Five (5) targets have been identified for the realisation of this defined strategic goal.

TARGET 17: By 2016, Tanzania has adopted NBSAP as a policy instrument, and has commenced implementation with effective participation.

Being a key policy instrument towards successful conservation of biodiversity, National Biodiversity Strategy and Action Plan (NBSAP) need to be adopted, and implemented in a participatory manner. This calls for development and implementation of Biodiversity Strategy and Action Plan (BSAPs) at both Sectoral and Local Government levels. In order to strengthen institutional framework regarding biodiversity issues and NBSAP implementation, establishment of an administrative mechanism to support the focal point is crucial. Inadequate policy and legal framework regarding biodiversity issues calls for the need to mainstream biodiversity into and harmonization of legislation, sector policies, plans and strategies. Furthermore, responding to the identified challenge of inadequate compliance to multilateral environmental agreements constitutes a priority. Major interventions will include ensuring compliance with commitments to multilateral agreements relevant for biodiversity through capacity building within key decision-making levels.

TARGET 18: By 2020, traditional knowledge, innovation and practices relevant for the conservation and sustainable use of biodiversity respected and safeguarded.

There exist wealth of traditional knowledge that can enhance biodiversity conservation. However, unsustainable land management that has strong ties with culture, traditions and beliefs have been identified among the underlying causes of biodiversity loss. The objective of this target is to ensure that traditional knowledge and their application effectively contribute to sustainable biodiversity conservation as well as improvement of the livelihoods of local communities. Focus will be given to promotion of traditional knowledge that enhances biodiversity conservation, control of traditional practices harmful to biodiversity and establishment of strategies to promote and preserve cultural heritage.

TARGET 19: By 2020, significant increase in the contribution of knowledge, technology and scientifically based information generated and shared.

Limited capacity for research, technology and generation of accurate information and data on biodiversity limit its contribution in planning and decision making process. This

target aims at increasing the knowledge base on biodiversity in order to strengthen the relationship between science and decision-making process on biodiversity related issues. More attention will be given to biodiversity-targeted research according to gaps identified in the needs assessment, however, whenever necessary research emerging issues will also be given priority. To ensure that the knowledge generated is applied, research information on biodiversity needs to be accessible for planning, informed and scientific based decision-making. To achieve this, the documentation system and infrastructure for the information and data sharing need to be strengthened. This calls for the establishment of a functional database including a fully operational of biodiversity Clearing House Mechanism (CHM). The option of a science-policy platform, as well as public private partnership linkage will facilitate mechanism to share knowledge, strengthen dialogue and communication and thus facilitate the coordination and packaging of research information on biodiversity and ecosystem services for biodiversity policy planners, managers and private sector. For proper planning, information regarding linkages between biodiversity and gender will be considered.

***TARGET 20*: By 2020, financial resources in support of biodiversity programmes significantly increased.**

Inadequate funding for biodiversity components is one of the weaknesses in successful implementation of various initiatives geared to halting biodiversity loss, including the implementation of the earlier NBSAP. Likely interventions include development of fundable proposals to address issues identified in the NBSAP, incorporation of biodiversity issues in annual planning and budgeting to as to increase government subventions, and development and implementation of a resource mobilization strategy and plan to increase funding for biodiversity. Effective biodiversity conservation is also banking on a strong partnership with development partners and all stakeholders.

The National targets detailed are drawn up in consideration of the local context but are congruent to the Aichi targets to enable national and global monitoring and record of progress made. **Table 6-1** provides the similarity and distinction to the Aichi 2020 targets.

Table 6-1: The National Biodiversity Targets with corresponding Aichi Targets

THE NATIONAL BIODIVERSITY TARGET	THE CORRESPONDING AICHI TARGET
TARGET 1: By 2020, at least 60% of the population is aware of the importance of biodiversity and its impact on human wellbeing and socioeconomic development of the country.	**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, Programmes for the valuation of biodiversity and payments for ecosystem services developed and integrated into national and local development strategies and plans.	**Target 2**: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.
TARGET 3: By 2020, incentives harmful to biodiversity are eliminated, phased out or reformed and positive incentives conservation and sustainable use of biodiversity are developed and applied.	**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 investments in systems of production and consumption based on sustainable eco-friendly practices increased.	**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.
TARGET 5: By 2020, the rate of degradation and fragmentation of ecosystems and the loss of habitats is significantly reduced.	**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, at least three Legislations that govern exploitation of aquatic and associated terrestrial resources are reviewed and enforced.	**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.

THE NATIONAL BIODIVERSITY TARGET	THE CORRESPONDING AICHI TARGET
TARGET 7: By 2020, biodiversity and agriculture related policies, laws and strategies promote sustainable management of forest, agricultural and aquaculture ecosystems.	**Target 7**: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.
TARGET 8: By 2020, all forms of pollution from water and land-based activities are brought to levels that are non-detrimental to biodiversity ecosystem functions.	**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 prevent their introduction and establishment.	**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 2020, the multiple anthropogenic pressure on coral reef, and vulnerable ecosystems impacted by climatic change are minimized.	**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.
Target 11: By 2020, area covered under marine protected areas be increased from 6.5% to 10% and effectively manage existing terrestrial and marine protected areas.	**Target 11**: By 2020, at least 17 per cent of terrestrial and inland water, 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, species that require special attention are identified and managed for long-term sustainability in a nationwide biodiversity assessment.	**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, strategies to reduce genetic erosion developed and implemented to maintain genetic diversity of cultivated plants, farmed and domesticated animals and their wild relatives.	**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.

THE NATIONAL BIODIVERSITY TARGET	THE CORRESPONDING AICHI TARGET
TARGET 14: By 2020, ecosystems that provide essential services, related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, local and vulnerable communities.	**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, thereby contributing to climate change mitigation and adaptation and to combating desertification.	**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 2020, Fair and Equitable Sharing of Benefits from utilization of biodiversity resource is in force and operational, consistent with national and international legislation.	**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.
TARGET 17: By 2016, Tanzania has adopted NBSAP as a policy instrument, and has commenced implementation with effective, participation.	**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, traditional knowledge, innovation and practices relevant for the conservation and sustainable use of biodiversity respected and safeguarded.	**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, significant increase in the contribution of knowledge, technology and scientifically based information generated and shared.	**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.

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

6.6 Integration of Biodiversity Related Conventions

Apart from Tanzania ratifying the Convention on Biological Diversity (CBD), it has also ratified several other international and regional conventions that relate to biodiversity conservation as indicated in previous sections. The governing bodies of the above mentioned global biodiversity-related agreements have adopted decisions or resolutions calling for enhanced synergies with other conventions, while the strategic planning documents of CBD, CITE, CMS and Ramsar Convention make provisions for implementing synergies as well. The identified key areas for synergies include;

i) The science-policy interface (including the role of the Intergovernmental Platform on Biodiversity and Ecosystem Services, IPBES);
ii) National Biodiversity Strategies and Action Plans and the national implementation of the Strategic Plan for Biodiversity 2011-2020;
iii) National reporting and;
iv) Capacity-building.

Mechanisms to synergize activities of Conventions and agreements that influence biodiversity conservation and sustainable use in the country would benefit building on and enhanced existing mechanisms for coordination and cooperation between national focal points and other actors responsible for specific conventions:

i) Collaboration of national focal points on NBSAP implementation, aided by appropriate mechanisms through Sector Environmental Units

The NBSAP 2015-2020 process offers opportunities for the national focal points of related conventions to better coordinate and collaborate using appropriate mechanisms.

ii) *Consideration of objectives of other conventions when implementing NBSAP 2015-2020*

The NBSAP 2015-2020 should include targets that complement other conventions, allowing for broad ownership of the NBSAP by focal points of other conventions, relevant agencies, institutions and stakeholders.

iii) Alignment of national policies and strategies for the non-CBD conventions with the NBSAP 2015-2020

National policies and strategies for the country-specific implementation of other (non-CBD) conventions and the NBSAP could be aligned, in the wider framework of the national implementation of the Strategic Plan for Biodiversity 2011-2020, without jeopardizing the convention-specific objectives and approaches for the country in question.

iv) Joint development of national indicators for convention implementation

National indicators for biodiversity and the implementation of the conventions could be jointly developed for the objectives of related conventions under the framework of the NBSAP 2015-2020 process and the Strategic Plan for Biodiversity 2011-2020.

v) Joint use of funding, in particular on national capacity-building for convention implementation

Implementation of NBSAP 2015-2020 across the national convention-related stakeholders could open new avenues for funding the national implementation of all six conventions (including access to GEF-funding for the implementation of the biodiversity MEAs in an integrated manner), not least through initiatives in the area of capacity building. Such funding for capacity building could support processes of building joint arrangements and mechanisms by stakeholders across the six conventions.

vi) Building integrated national biodiversity information systems

The collaboration between focal points to the different conventions on reporting could extend to building integrated national biodiversity information systems that assemble and make available data and information modules of relevance to national reporting to all conventions. This would avoid duplication of efforts of national focal points or institutions and agencies in collecting the data and information that is required for national reporting. Such efforts would benefit from the development and testing of guidelines for strengthening and integrating national management of biodiversity information.

The synergies process for the biodiversity-related conventions can also build on the wide range of existing cooperation as well as make use of the options for collaboration and coordination at the global, regional and national levels provided by the Strategic Plan for Biodiversity 2011-2020.

6.7 Mainstreaming of Emerging and Crosscutting Issues

In implementing the NBSAP, mainstreaming of emerging and cross cutting issues that influence the set measures for conservation and sustainable use of biodiversity are required. Emerging and crosscutting issues that are envisioned to raise concern for conservation in Tanzania include local communities; gender inequality; poverty; genetically modified organisms (GMOs) and synthetic biology; invasive alien species (IAS); biofuels; oil and gas exploration and extraction; climate change; e-waste and access and benefit sharing (ABS) of genetic resources. In order to successfully protect Tanzania's biodiversity these issues have been considered in the formulation of National Biodiversity Targets and the priority actions.

CHAPTER SEVEN

NATIONAL ACTIONS TO ACHIEVE THE STRATEGY

The NBSAP action plan is presented as a road map to achieving the Aichi targets whilst prioritising and setting timelines with responsible parties for each action. The action plan further stipulates long and short-term milestones to enable prioritization of the activities. The action plan has been presented in matrices highlighting the national targets, priority actions for intervention, timeframe, and performance indicators and implementing institutions (**Table 7-1** to **Table 7-5**).

7.1 Application of NBSAP 2015-2020 to Sector and Local Government Authorities

Effective and efficient implementation of NBSAP requires public participation and partnership with non-state actors, fostered through development and implementation of Biodiversity Strategies and Action Plans (BSAPs) by the MDAs and Local Government Authorities.

Sector BSAPs need to be developed and implemented under the auspices of the environmental units in all MDAs. It is also recommended to have harmonized information and appropriate guidelines to assist Local Authorities in the development and implementation of sub-national BSAPs.

It is recommended that the NBSAP be implemented within the context of the Local Government Authorities, which provide a framework for local community participation, and hence a strategic architecture with existing processes through which Local BSAPs consistent with NBSAP can be developed and implemented.

For successful implementation of NBSAPs it is imperative to build inclusive partnerships between State (relevant ministries, departments and agencies, local government authorities) and Non-State Actors (International and national NGOs, CSOs, Private Sector, etc.) during development and implementation BSAPs.

7.2 Mainstreaming Biodiversity Conservation into Sectoral Policies, Plans and Strategies

Mainstreaming biodiversity conservation into sectoral policies, plan and strategies is a pre-requisite towards successful conservation of biodiversity and achievement of the long-term vision of the country. Tanzania has so far made various efforts to conserve biodiversity by integrating it into various national, sectoral and cross-sectoral policies, plans and programmes.

At ministry level sector development and implementation of Sectoral Environmental Action Plans (SEAPs) is key and has been initiated as a mechanism to mainstream environment and biodiversity into plans and strategies in the relevant sectors such as

Health, Agriculture, Livestock, Fisheries, Tourism; Forestry, Water, Infrastructure, Land, Energy and Extractive industry. In Education and Higher Learning Institutions the curriculum is to integrate biodiversity knowledge in the teaching and learning processes. Currently this is widespread with several schools even having clubs to support biodiversity conservation (Roots and shoots) and dedicated degree programmes are being offered in local universities.

Cross-cutting sectors such as Science and Technology, business and industry are expected to support other sectors and ensure inclusive approaches to address matters such as climate change, pollution, disaster management, technology acquisition, development and application, research and innovation, empowerment and sustainable development.

Table 7-1: Strategic Goal A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

TARGET 1: By 2020, at least 60% of the population is aware of the importance of biodiversity and its impact on human wellbeing and socio-economic development of the country.				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
1.1 Strengthen role of coordinating institution for biodiversity conservation	2016	1.1.1 Implementing instruments for coordination 1.1.2 Number of staff working on biodiversity related issues increased	• Legislation document • Standard Operating Procedures (SOPs) • Guidelines • Establishment report • Other Reports	Ministry responsible for Environment (VPO-DoE and FVPO-DoE)
1.2 Implement the National Environmental Education and Communication Strategy (NEECS) to promote biodiversity	2017	1.2.1 Number of Environmental Education and Communication programmes	• Strategy document • Implementation plan • Environmental Clubs • Report on outreach materials	Ministries responsible for Environment, Education, Wildlife, Forestry, Fisheries, Livestock, Agriculture, Water, Infrastructure, Mining, Local Government; Private sector; Research and Academic Institutions; LGAs; Media; NGOs and CBOs
1.3 Establish, strengthen and implement awareness programmes to promote and encourage the effective stakeholder participation in the stewardship of the biodiversity	2020	1.3.1 Number of awareness programmes 1.3.2 Percentage of population participating in biodiversity related activities	• Awareness programmes reports • Radio and television programs • Awareness material (poster, brochure, fliers)	Ministry responsible for Environment, Education, Wildlife, Forestry, Fisheries, Livestock, Agriculture, Water, Local Government; Private sector; Research and Academic Institutions; LGAs; NGOs and CBOs

1.4 Mainstream biodiversity into all levels of education	2020	1.4.1 Number of programmes developed	• Approved curricula for primary, secondary and tertiary levels. • Approved text books • Teaching materials	Ministry responsible for Environment and Education, Wildlife, Forestry, Fisheries, Livestock, Agriculture, Water, Local Government; Private sector; Research and Academic Institutions; LGAs; NGOs and CBOs
1.5 Promote biodiversity related exhibitions	2020	1.5.1 Number of exhibitions conducted	• Attendance register • Survey reports	Ministry responsible for Environment, Education, Wildlife, Forestry, Fisheries, Tourism, Private sector; Research and Academic Institutions; LGAs; NGOs and CBOs, COSTECH
TARGET 2: By 2020, Programmes for the valuation of biodiversity and payments for ecosystem services developed and integrated into national and local development strategies and plans				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
2.1 Institutionalise and develop methodology and tools for economic valuation of biodiversity and payment for ecosystem services	2018	2.1.1 Mechanism for Economic valuation and payment for ecosystem services in place 2.1.2 Number of economic tools for quantification of the value of biodiversity resources and payment for ecosystem services developed	• Documents • Valuation report • Study report • Manuals	Ministry responsible for Environment, Water, Wildlife, Forestry, Fisheries, Energy, Local Government; Finance; Planning Commission, Academic and Research Institutions, NGOs and CBOs

2.2 Enhance institutional and human capacity on use of tools for biodiversity and ecosystem valuation	2020	2.2.1 Number of institutions strengthened 2.2.2 Number of capacity building initiatives 2.2.3 Number of trained personnel	• Reports • Capacity building programmes reports • List of Trainees • Training report • List of trainees	Ministry responsible for Environment, Finance, Water, Wildlife, Forestry, Fisheries, Energy, Local Government; Planning Commission, Academic and Research Institutions, NGOs and CBOs
2.3 Sensitize private sector to pay for biodiversity and other ecosystem services	2020	2.3.1 Number of private sectors paying for ecosystem services 2.3.2 Number of sensitization programmes	• Reports	Ministry responsible for Environment, Finance, Forestry, Agriculture, Local Government; Ministry of Finance, Ministry of Industry and Trade, Planning Commission, Private Sector, Academic and Research Institutions, NGOs and CBOs
2.4 Integrate benefits accrued from biodiversity and payment for ecosystem services into government structures	2020	2.4.1 Total revenue generated from payments for biodiversity and ecosystem services by sector	• Revenue report • Budget speeches	Ministry responsible for Environment, Finance, Water, Wildlife, Forestry, Fisheries, Energy, Local Government; Planning Commission, Academic and Research Institutions, NGOs and CBOs
2.5 Strengthen the enforcement of biodiversity related legislation	2017	2.5.1 Baseline of compliance established 2.5.2 Awareness on compliance raised	• Baseline report • Enforcement reports	Ministry responsible for Environment, Finance, Water, Wildlife, Forestry, Fisheries, Energy, Local Government, Home Affairs; NEMC; LGAs; BMUs; MPAs

TARGET 3: By 2020, incentives harmful to biodiversity are eliminated, phased out or reformed and positive incentives are developed and applied.				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
3.1 Identify incentives which harm biodiversity	2017	3.1.1 Number and value of harmful incentives identified	• Assessment reports	Ministry responsible for Environment, Finance, Wildlife, Forestry, Fisheries, Livestock, Agriculture, Water, Local Government; Private sector; Research and Academic Institutions; LGAs; NGOs and CBOs
3.2 Remove, reform or phase-out harmful incentives	2020	3.2.1 Number and value of harmful incentives removed, reformed or phased out	• Assessment reports	Ministry responsible for Environment, Finance, Wildlife, Forestry, Fisheries, Livestock, Agriculture, Water, Local Government; Private sector; Research and Academic Institutions; LGAs; NGOs and CBOs
3.3 Establish and reinforce the existing and new biodiversity friendly incentives	2020	3.3.1 Number of biodiversity friendly incentives identified	• Reports	Ministry responsible for Environment, Finance, Wildlife, Forestry, Fisheries, Livestock, Agriculture, Water, Local Government; Private sector; Research and Academic Institutions; LGAs; NGOs and CBOs

TARGET 4: By 2020, investments in systems of production and consumption based on sustainable eco-friendly practices increased				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
4.1 Strengthen enforcement of legislation related to investments and utilization of natural resources	2020	4.1.1 Incidences of violation of legislation reduced 4.1.2 Percentage of investments with environmental clearance 4.1.3 Number of investments penalized for violation of legislation	• Enforcement reports • Investments reports	Ministry responsible for Environment, Forestry, Wildlife, Tourism, Fisheries, Minerals, Local Government, Home Affairs, Defence, Lands, Water, Agriculture, Industries, Energy, NEMC, BMUs, NGOs and CBOs
4.2 Promote eco-friendly production and consumption methods	2020	4.2.1 Number of enterprises applying sustainable production and consumption methods	• Enterprises environmental reports (audit, systems, management)	Ministry responsible for Environment, Tourism, Forestry, Fisheries, Wildlife, Energy, Lands, Water, Agriculture, Livestock, Industries, Local Government; LGAs, NEMC, NGOs and CBOs
4.3 Review management plans and support gazettement of forests on general land	2020	4.3.1 Number of Forest management plans in place	• Management plan document	Ministry responsible for PMO-RALG, Forestry, Energy, Environment, Local Government, NEMC, Private Sector, NGOs and CBOs
4.4 Control and promote efficient sustainable technologies for charcoal production	2020	4.4.1 Number of charcoal producers using efficient technologies 4.4.2 Number of efficient charcoal production technologies	• Plan document • Reports • Technology and demonstration manuals	Ministry responsible for Forestry, Energy, Environment, Local Government, NEMC, Private Sector, NGOs and CBOs

4.5 Promote and strengthen energy conservation initiatives and tools	2020	4.5.1 Number of initiatives in place 4.5.2 Number and type of alternative energy technologies adopted 4.5.3 Number of households using alternative energy	• Survey reports	Ministry responsible for Forestry, Energy, Environment, Local Government, Private Sector, NGOs and CBOs
4.6 Educate and promote environmental friendly technologies such as wood fuel saving stoves and the use of biogas	2020	4.6.1 Type of environmental friendly technologies adopted 4.6.2 Number of household participating in environmental friendly technologies	• Reports • Publications	Ministry responsible for Forestry, Energy, Environment, Livestock, Local Government, Private Sector, NGOs and CBOs
4.7 Promote cleaner production technologies	2020	4.7.1 Number of enterprises using cleaner production technologies	• Survey reports	Ministry responsible for Lands, Industries, Environment, Water, Wildlife, Forestry, Fisheries, Livestock, Agriculture, Local Government, Private Sector, NGOs and CBOs, Cleaner Production Center – Tanzania
4.8 Promote green farming practices	2020	4.8.1 Number of demonstration farms 4.8.2 Number of stakeholders participating in green farming	• Reports • Sector programs	Ministry responsible for Forestry, Agriculture, Environment, Livestock, Local Government, Private Sector, NGOs and CBOs
4.9 Promote sustainable aquaculture technologies	2020	4.9.1 Number and type of technologies used 4.9.2 Number of stakeholders engaged 4.9.3 Number of demonstration farms	• Survey reports • Publications • Sector programs	Ministry responsible for Environment, Fisheries, Lands, Industries, Water, Wildlife, Livestock, Agriculture, Local Government, Private Sector, NGOs and CBOs

4.10	National policy and legislation related to development of biofuels	2020	4.10.1 Relevant national policies and legislation on biofuels in place and implemented	• National policy document • Legislation document	Ministry responsible for Energy, Science and Technology, Local Government, Environment, Agriculture, Forestry, Livestock, and COSTECH, NEMC, Private sector, NGOs/CBOs
4.11	Promote research and disseminate information on Biofuels development	2020	4.11.1 Number of research conducted 4.11.2 Number of research findings disseminated	• Research reports	Ministry responsible for, Energy, Science and Technology, Local Government, Environment, Agriculture, Forestry, Livestock, COSTECH, NEMC, Private sector, NGOs/CBOs
4.12	Strengthen public awareness programmes on biofuels development	2020	4.12.1 Number of awareness programmes	• Reports	Ministry responsible for Energy, Environment, Education, Agriculture, Livestock; Local Government Authorities, Institutions, Media

Table 7-2: Strategic Goal B. Reduce the direct pressures on biodiversity and promote sustainable use

TARGET 5: By 2020, the rate of degradation and fragmentation of ecosystems and the loss of habitats is significantly reduced.				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
1.1 Review and implement appropriate policies, strategies and plans	2020	1.1.1 Number of policies, strategies and plans reviewed, formulated or implemented	• Reviewed documents • Implementation plan	Ministry responsible for Environment, Lands, Water, Wildlife, Forestry, Fisheries, Energy, Local Government; Lands use Planning Commission, Academic and Research Institutions, NGOs and CBOs

1.2	Carry out environmental mapping to identify highly degraded/fragile areas	2018	1.2.1 Number of mapped areas	• Inventory reports • Maps	Ministry responsible for Environment, Lands, Water, Wildlife, Forestry, Fisheries, Energy, Local Government; Land use Planning Commission, Academic and Research Institutions, NGOs and CBOs
1.3	Promote and support effective land use planning	2020	1.3.1 Land use plan in place and implemented	• Land use plan document	Sector Ministries; Land use Planning Commission, Academic and Research Institutions, NGOs and CBOs
1.4	Strengthen preventive measures against wild fires	2018	1.4.1 Incidences of wild fires reduced	• Reports	Ministry responsible for Forestry, Agriculture, Livestock, Wildlife, Local Government, NGOs, CBOs and Media
1.5	Enhance implementation of the National Action Plan (NAP) to Combat Desertification	2018	1.5.1 Rate of desertification reduced	• Reports	Ministry responsible for Environment, Forestry, Livestock, Agriculture, Local Government, NEMC, NGOs and CBOs
1.6	Strengthen and scale-up Community-Based Natural Resources Management best practices	2020	1.6.1 Number of community-based best practices in place	• Documented lessons	Ministry responsible for Environment, Lands, Water, Wildlife, Forestry, Energy, Local Government; Academic and Research Institutions, NGOs and CBOs
1.7	Promote establishment of wood lots	2020	1.7.1 Area and size of wood lots	• Reports	Ministry responsible for Forestry, Local Government, Private Sector, NGOs and CBOs
1.8	Strengthen tree planting, restoration and conservation campaign	2020	1.8.1 Number of trees planted and survived 1.8.2 Acreage of land planted with trees	• Reports	Ministry responsible for Forestry, Environment, Local Government, Private Sector, NGOs and CBOs

TARGET 6: By 2020, at least three Legislations that govern exploitation of aquatic and associated terrestrial resources are reviewed and enforced.				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
6.1 Review and enforce legislation to conserve aquatic resources	2020	6.1.1 Number of legislation reviewed	• Government gazette notice	Ministry responsible for Environment, Justice, Transport, Fisheries, Forestry, Agriculture, Lands, Local Government; NEMC; Parliament; NGOs and CBOs
6.2 Promote conservation and sustainable use of mangroves and coastal forests	2020	6.2.1 Percentage of mangrove and coastal forest areas sustainably managed	• Management plans • Survey reports	Ministry responsible for Environment, Minerals, Fisheries, Forestry, Lands, Local Government, NEMC, Academic and Research Institutions, NGOs and CBOs
6.3 Strengthen coastal and beach erosion control system	2020	6.3.1 Percentage of coastal and beach areas sustainably managed	• Survey reports • Management plans	Ministry responsible for Environment, Minerals, Fisheries, Forestry, Lands, Local Government, NEMC, Academic and Research Institutions, NGOs and CBOs
6.4 Promote sustainable management of coastal and marine environment	2020	6.4.1 Number of coastal and marine management programmes in place	• Management plans • Survey reports	Ministry responsible for Environment, Minerals, Fisheries, Forestry, Lands, Local Government, NEMC, Academic and Research Institutions, NGOs and CBOs
6.5 Strengthen measures against blast fishing	2020	6.5.1 Number of blast fishing incidences reduced	• Blast fishing cases registered to the court • Monitoring reports	Ministry responsible for Environment, Fisheries, Wildlife, Defence, Local Government, NEMC, Marine Parks, NGOs and CBOs

6.6	Promote participatory fishery management	2020	6.6.1 Number of CFMs including BMUs in place	• Survey reports	Ministry responsible for Education, Environment, Fisheries, Community Development, Local Government; NEMC; NGOs and CBOs
6.7	Promote regional cooperation on management of trans-boundary water resources	2020	6.7.1 Number of functional agreements, regional programmes, plans and projects in place	• Reports • Regional agreements	Ministry responsible for Foreign Affairs, Water, Environment, Fisheries, Local Government
6.8	Strengthen institutional and human capacity and awareness in management of aquatic resources	2020	6.8.1 Number and type of capacity building and awareness initiatives 6.8.2 Number of trained personnel 6.8.3 Number of institutions strengthened	• Training Needs Assessment (TNA) report • Reports • List of trainees	Ministry responsible for Environment, Water, Fisheries, Forestry, Local Government, Academic and Research Institutions, NGOs and CBOs
6.9	Strengthen monitoring, data collection and information management on aquatic resources	2020	6.9.1 Number of monitoring programmes in place 6.9.2 Data and information accessible and utilised	• Monitoring Reports • Monitoring Plans	Ministry responsible for Environment, Water, Fisheries, Local Government, Agriculture, Forestry, Livestock, NEMC, COSTECH, Academic and Research Institutions, Private Sector, NGOs and CBOs
6.10	Promote research and dissemination of research findings on aquatic resources management	2020	6.10.1 Number of research conducted and disseminated 6.10.2 Number of best practices and priority areas	• Scientific publications • Annual Research and dissemination plan/report • Documented lessons	Ministry responsible for Agriculture, Environment, Fisheries, Forestry, Wildlife, Water, Local Government, COSTECH, NEMC, NGOs and CBOs

TARGET 7: By 2020, biodiversity and agriculture related policies, laws and strategies promote sustainable management of forest, agricultural and aquaculture ecosystems.				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
7.1 Implement the existing policies, laws and strategies for biodiversity and Agriculture	2020	7.1.1 Number of policies, laws and strategies implemented	• Implementation reports	Ministry responsible for Agriculture, Environment, Fisheries, Livestock, Forestry, Wildlife, Local Government, NEMC, NGOs and CBOs
7.2 Promote sustainable agricultural technologies and practices	2020	7.2.1 Number of technologies and sustainable practices adopted	• Documented lessons • Survey reports	Ministry responsible for Agriculture, Livestock, Local Government, NGOs and CBOs
7.3 Promote rangeland resources management	2020	7.3.1 Number of plans, programmes and strategies adopted	• Survey reports • Documented lessons	Ministry responsible for Agriculture, Forestry, Livestock, Local Government, NGOs and CBOs
7.4 Strengthen and enforce sustainable land use planning practises	2016	7.4.1 Number of land disputes reduced 7.4.2 Percentage of degraded area reduced 7.4.3 Number of land use plans in place and approach for implementation	• Reports	Ministry responsible for Lands, Agriculture, Forestry, Wildlife, Livestock, Environment
TARGET 8: By 2020, all forms of pollution from water and land-based activities are brought to levels that are non-detrimental to biodiversity ecosystem functions.				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
8.1 Strengthen implement/enforce legislation related to environmental pollution prevention and control	2020	8.1.1 Number of legislation enforced 8.1.2 Level of compliance increased 8.1.3 Level of pollution	• Enforcement reports • Implementation plan • EIA reports	Ministry responsible for Land, Home Affairs; Water, Agriculture, Environment, Fisheries, Transport, Industries, Livestock, Local Government; LGAs

			reduced		NEMC, Private Sector, NGOs and CBOs
8.2	Promote the use of appropriate liquid waste management technologies	2020	8.2.1 Number of technologies 8.2.2 Number of people and entities using appropriate technologies	• Reports • Survey reports	Ministry responsible for Lands, Industries, Environment, Water, Wildlife, Forestry, Fisheries, Livestock, Agriculture, Local Government, Private Sector, NGOs and CBOs
8.3	Strengthen database and reporting system on municipal waste management	2018	8.3.1 Availability of updated data	• Annual environmental monitoring reports	Ministry responsible for Environment, Local Government, Private Sector, NGOs and CBOs
8.4	Control pollution in aquatic and terrestrial ecosystems	2020	8.4.1 Number of aquatic and terrestrial ecosystems that meet standards 8.4.2 Number of monitoring programmes	• Monitoring and evaluation Reports	Ministry responsible for Lands, Water, Agriculture, Environment, Fisheries, Transport, Industries, Livestock, Local Government, Energy, NEMC, Private Sector, NGOs and CBOs
8.5	Develop and implement national waste management strategy and action plan	2020	8.5.1 National waste management strategy and action plan in place	• Strategy document	Ministry responsible for Environment, Local Government, Private Sector, NGOs and CBOs
8.6	Promote use of excreta and other organic waste as sources of energy	2020	8.6.1 Number of biogas digesters/plants in place	• Survey reports	Ministry responsible for Energy, Health, Industries, Environment, Livestock, Agriculture, Local Government, Energy, CAMARTEC, REA, Private Sector, NGOs and CBOs
8.7	Strengthen implementation of programmes on upgrading of infrastructure for unplanned settlements	2020	8.7.1 Areas with upgraded waste management infrastructures	• Survey reports • Implementation reports	Ministry responsible for Lands, Works, Environment, Local Government, Private Sector, NGOs and CBOs

8.8 Strengthen institutional and human capacity on issues related to pollution management	2020	8.8.1 Number of capacity building initiatives 8.8.2 Number of trained personnel 8.8.3 Number of institutions strengthened	• Reports • List of trainees	Ministry responsible for Lands, Water, Agriculture, Environment, Fisheries, Transport, Industries, Livestock, Local Government, Energy, NEMC, Private Sector, NGOs and CBOs
8.9 Develop and strengthen catchment management plans	2018	8.9.1 Number of catchment management plans in place and implemented	• Management plan document • Implementation reports	Ministry responsible for Lands, Minerals, Water, Health, Energy, Agriculture, Wildlife, Foresty, Livestock, Environment, Local Government; LGAs, Private Sector, NGOs and CBOs
8.10 Enhance protection and conservation of water catchment areas	2020	8.10.1 Number of catchment areas protected	• Annual reports • Inspection reports	Ministry responsible for Lands, Minerals, Water, Energy, Agriculture, Wildlife, Forestry, Livestock, Environment, Local Government; LGAs, Private Sector, NGOs and CBOs
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 prevent their introduction and establishment.				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
9.1 Review and implement relevant national policies and legislation to address issues of Invasive Alien Species (IAS)	2020	9.1.1 Number of policies and legislation reviewed and implemented	• Reviewed documents • Implementation plan	Ministry responsible for Environment, Water, Fisheries, Agriculture, Justice, Forestry, Livestock and Local Government
9.2 Conduct inventory of IAS	2018	9.2.1 Inventory report in place	• Inventory report	Ministry responsible for Environment, Wildlife, Fisheries, Agriculture, Forestry, Livestock and Local Government, NGOs and CBOs

9.3	Establish/ strengthen monitoring programmes and reporting	2020	9.3.1 Monitoring programmes in place	• Monitoring reports	Ministry responsible for Environment, Wildlife, Fisheries, Agriculture, Forestry, Livestock and Local Government, NGOs and CBOs
9.4	Strengthen phytosanitary inspection at entry points	2020	9.4.1 Number of entry points conducting inspection 9.4.2 Record of species from entry points	• Monitoring reports	Ministry responsible for Environment, Wildlife, Fisheries, Agriculture, Forestry, Livestock and Local Government
9.5	Promote application of Integrated Pest Management (IPM) to control invasive alien species	2020	9.5.1 Number/area of IAS controlled	• Reports	Ministry responsible for Water, Environment, Wildlife, Fisheries, Agriculture, Forestry, Livestock and Local Government
9.6	Promote research and information dissemination on IAS	2020	9.6.1 Number of research promoted 9.6.2 Number of research findings disseminated	• Reports and publications	Ministry responsible for Environment, Wildlife, Fisheries, Agriculture, Forestry, Livestock and Local Government, COSTECH, NEMC, Academic and Research Institution, Private Sector, NGOs and CBOs
9.7	Develop and promote national, regional and international cooperation/agreements on control of IAS	2020	9.7.1 Number of IAS cooperation/agreements established 9.7.2 Number of networks established	• Signed/ratified documents • Reports	Ministry responsible for Environment, Agriculture, Fisheries, Forestry, Livestock, Local Government, COSTECH, NEMC, Academic and Research Institutions, Private Sector, NGOs and CBOs
9.8	Strengthen advocacy, public awareness and sensitization on IAS and their management	2020	9.8.1 Number of awareness programmes	• Reports	Ministry responsible for Environment, Agriculture, Fisheries, Forestry, Livestock, Local Government, COSTECH, NEMC, Academic and Research Institutions, Private Sector, NGOs and CBOs

TARGET 10: By 2020, the multiple anthropogenic pressure on coral reef, and vulnerable ecosystems impacted by climatic change are minimized.				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
10.1 Strengthen fisheries management along coral reefs and closely associated ecosystems	2020	10.1.1 Status of coral reefs and closely related ecosystems improved 10.1.2 Abundance of fish in coral reefs and associated ecosystems increased	• Survey reports	Ministry responsible for Environment, Fisheries, Local Government, Academic and Research Institutions, Private Sector, NGOs and CBOs
10.2 Assess and control land and sea-based sources of pollution	2020	10.2.1 Sources of land and sea based pollution identified 10.2.2 Extent and boundaries of pollution established 10.2.3 Vulnerable ecosystems identified 10.2.4 Number of management programmes developed	• Survey reports	Ministry responsible for Environment, Agriculture, Fisheries, Forestry, Livestock, Mining, Infrastructure, Transport, Local Government, NEMC, Academic and Research Institutions, Private Sector, NGOs and CBOs
10.3 Control coastal development	2020	10.3.1 Number of impact assessments conducted for coastal developments 10.3.2 Audits of coastal developments	• EIA reports • Audit reports	Ministry responsible for Environment, Agriculture, Fisheries, Forestry, Livestock, Mining, Infrastructure, Transport, Local Government, NEMC, Academic and Research Institutions, Private Sector, NGOs and CBOs

10.4	Implement integrated watershed and marine management	2020	10.4.1 Integrated watershed and marine management programme developed and operational	• Programme document • Implementation plan	Ministry responsible for Environment, Agriculture, Fisheries, Forestry, Livestock, Mining, Infrastructure, Transport, Local Government, NEMC, Academic and Research Institutions, Private Sector, NGOs and CBOs
10.5	Enhance institutional and human capacity for management of coral reefs and closely associated ecosystems	2020	10.5.1 Number and type of capacity building initiatives 10.5.2 Number of trained personnel 10.5.3 Number of institutions strengthened	• Reports • Training Needs Assessment Report • List of trainees	Ministry responsible for Environment, Fisheries, Forestry, Local Government, NEMC, Academic and Research Institutions, Private Sector, NGOs and CBOs
10.6	Establish/ strengthen monitoring programmes and mechanisms for coral reef conservation	2017	10.6.1 Monitoring programme in place 10.6.2 Tanzania Coral Reef Task Force functional	• Monitoring reports • Meeting reports/minutes	Ministry responsible for Environment, Fisheries, Local Government, Academic and Research Institutions, Private Sector, NGOs and CBOs
10.7	Promote Regional Cooperation for coral reef conservation	2018	10.7.1 Number of Regional Cooperation in place	• Partnership agreement/MoU documents	Ministry responsible for Environment, Fisheries, Foreign Affairs, NEMC, Academic and Research Institutions, Private Sector, NGOs and CBOs
10.8	Conduct assessment of coral reefs status and impact of climate on communities	2020	10.8.1 National coral reef status established 10.8.2 Climatic impact on community composition and population established 10.8.3 Extinction risk of vulnerable communities determined	• Survey reports	Ministry responsible for Environment, Fisheries, Local Government, Academic and Research Institutions, Private Sector, NGOs and CBOs

Table 7-3: Strategic Goal C. Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

Target 11: By 2020, area covered under marine protected areas be increased from 6.5% to 10% and effectively manage the existing terrestrial and marine protected areas.				
Priority actions for intervention	**Timeframe**	**Performance indicators**	**Verifier**	**Implementing institution**
11.1 Strengthen policies, plans and strategies aimed at managing terrestrial and marine protected areas	2020	11.1.1 Level of compliance increased 11.1.2 Number of policies, plans and strategies implemented	• Enforcement reports • Implementation reports	Ministry responsible for Environment, Forestry, Wildlife, Lands, Fisheries, Livestock, Local Government, Academic and Research institutions, Private Sector, NGOs and CBOs
11.2 Establish new marine protected areas in biodiversity hotspots and fragile ecosystems	2020	11.2.1 Number and proportion of new marine protected areas	• Baseline reports • Gazettement orders	Ministry responsible for Environment, Forestry, Water, Wildlife, Lands, Local Government, Academic and Research institutions, NGOs and CBOs
11.3 Promote and strengthen Wildlife Management Areas (WMAs) and CFMs	2020	11.3.1 Number and status of WMAs and CFMs	• Survey reports • Partnership agreement/MoU documents	Ministry responsible for Environment, Forestry, Water, Wildlife, Lands, Local Government, Academic and Research institutions, NGOs and CBOs
11.4 Promote ecosystem approach in marine protected areas	2020	11.4.1 Number of marine protected areas practicing ecosystem approach	• Management plans • Reports	Ministry responsible for Fisheries, Environment, Forestry, Wildlife, Local Government, Marine Parks, NGOs and CBOs

11.5	Promote and strengthen Regional Cooperation on protection and conservation of trans-boundary terrestrial and marine protected areas	2020	11.5.1 Number of functional agreements	• Agreement /cooperation documents • Implementation plans	Ministry responsible for Environment, Wildlife, Foreign Affairs, Forestry, Water, Lands, Local Government; EAC, SADC, COMESA
11.6	Strengthen measures to limit illegal exploitation of resources in terrestrial and marine protected areas	2020	11.6.1 Incidence of illegal exploitation of resources in terrestrial and marine protected areas reduced	• Reports • Poaching statistics	Ministry responsible for Environment, Wildlife, Forestry, Water, Lands, Local Government, Academic and Research institutions, NGOs and CBOs
11.7	Enhance institutional, research and human capacity on the management of terrestrial and marine protected areas	2020	11.7.1 Number of research outputs 11.7.2 Number of capacity building initiatives 11.7.3 Number of trained personnel 11.7.4 Number of institutions strengthened	• Reports • List of initiatives • List of trainees	Ministry responsible for Environment, Wildlife, Forestry, Water, Lands, Local Government, Academic and Research institutions, NGOs and CBOs
TARGET 12: By 2020, nationwide biodiversity assessment conducted, species that require special attention identified and managed to ensure their long-term sustainability.					
Priority actions for intervention		**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
12.1	Conduct biodiversity assessment	2020	12.1.1 Biodiversity updates and alerts list 12.1.2 Biodiversity status maps available	• Assessment reports • Inventory reports • Maps	Ministry responsible for Environment, Wildlife, Fisheries, Agriculture, Forestry, Livestock and Local Government, COSTECH, NEMC, Academic and

				Research Institution, Private Sector, NGOs and CBOs
12.2 Establish a National Red data Book (NRB) for flora and fauna and make it accessible to users	2020	12.2.1 NRB for both flora and fauna available 12.2.2 Number of institutions/ individuals using NRB	• Permit/order to establish NBR • NBR National reports • Institutions/corporate report statements	Ministry responsible for Environment, Wildlife, Fisheries, Agriculture, Forestry, Livestock and Local Government, COSTECH, NEMC, Academic and Research Institution, Private Sector, NGOs and CBOs
12.3 Promote and implement monitoring, conservation and recovery programmes for endangered and threatened species	2020	12.3.1 Number of monitoring, conservation and recovery programmes 12.3.2 Number of registered endangered and threatened species 12.3.3 Reduced number of endangered species	• Environmental monitoring reports • Assessment reports	Ministry responsible for Wildlife, Forestry, Environment, Fisheries, Tourism, Water, Lands, Local Government, Academic and Research Institutions, NEMC, Media, NGOs and CBOs
TARGET 13: By 2020, species that require special attention are identified and managed for long-term sustainability in a nationwide biodiversity assessment.				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
13.1 Strengthen implementation of legislations related to safe use of modern biotechnology	2020	13.1.1 Number of legislation in place 13.1.2 Level of compliance increased 13.1.3 Number of permits/approvals/applications for modern	• Legislation document • Permits/approvals/applications documents • Reports	Ministry responsible for Forestry, Environment, Fisheries, Health, Livestock, Agriculture, Local Government, COSTECH, NEMC, Academic and Research Institutions, NGOs

			biotechnology 13.1.4 Number of enforcement tools in place		and CBOs
13.2	Establish inventory of threatened genetic species of cultivated plants, non-timber forest products and farmed and domesticated animals including their wild relatives	2020	13.2.1 Database of threatened genetic species in place	• Reports	Ministry responsible for Forestry, Environment, Fisheries, Livestock, Agriculture, Local Government, COSTECH, NEMC, Academic and Research Institutions, NGOs and CBOs
13.3	Develop and implement management plans for threatened genetic diversity of cultivated plants, and farmed and domesticated animals including their wild relatives, non-timber forest products	2020	13.3.1 Progress of management plans implemented 13.3.2 Number of threatened genetic species maintained	• Implementation reports	Ministry responsible for Forestry, Environment, Fisheries, Livestock, Agriculture, Local Government, COSTECH, NEMC, Academic and Research Institutions, NGOs and CBOs
13.4	Establish and strengthen gene banks	2020	13.4.1 Gene bank in place 13.4.2 Number of Gene bank accessions	• Orders establishing the Gene Bank • Established Gene Bank • Activity Reports	Ministry responsible for Environment, Wildlife, Forestry, Agriculture, TPRI, Livestock, Fisheries, Local Government, Academic and Research institutions, NGOs and CBOs

13.5	Enhanced institutional, research and human capacity on genetic diversity related issues	2020	13.5.1 Number of institutions strengthened 13.5.2 Number and type of research conducted 13.5.3 Number of capacity building initiatives 13.5.4 Number of trained personnel	• Training Needs Assessment Report • List of trainees • Activity Reports	Ministry responsible for Environment, Wildlife, Forestry, Agriculture, Livestock, Fisheries, Local Government, Academic and Research institutions, NGOs and CBOs

Table 7-4: Strategic Goal D. Enhance the benefits to all from biodiversity and ecosystem services

TARGET 14: By 2020, ecosystems that provide essential services, related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, and local communities, and the poor and vulnerable.				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
14.1 Develop, strengthen and implement management programmes for major watersheds	2018	14.1.1 Management programmes for major watersheds developed/ strengthened	• Management programme documents	Ministry responsible for Environment, Water, Wildlife, Forestry, Agriculture, Livestock, Fisheries, Local Government, Academic and Research institutions, NGOs and CBOs
14.2 Strengthen the implementation of programmes for protection and restoration of coral reefs and mangroves	2020	14.2.1 Number of areas protected/ restored 14.2.2 Number of conservation campaigns	• Survey reports • Reports	Ministry responsible for Forestry, Fisheries, Environment, Local Government, Private Sector, NGOs and CBOs

14.3	Compile and inclusively avail information on the services and the benefits provided by ecosystems received to local communities	2020	14.3.1 Information on services and benefits provided by ecosystems available	• Reports	Ministry responsible for Forestry, Environment, Fisheries, Health, Water, Wildlife, Tourism, Livestock, Finance, Agriculture, Local Government, COSTECH, NEMC, Academic and Research Institutions, NGOs and CBOs
14.4	Establish changes in ecosystem services of key habitats caused by anthropogenic activities and identify the affected parties	2020	14.4.1 Trends in changes in ecosystem services established 14.4.2 Affected parties identified	• Reports	Ministry responsible for Environment, Forestry, Fisheries, Health, Water, Wildlife, Tourism, Livestock, Agriculture, Local Government, COSTECH, NEMC, Academic and Research Institutions, NGOs and CBOs
14.5	Formulate, strengthen and implement monitoring programmes for key habitats that provide ecosystem services	2020	14.5.1 Monitoring programmes developed/ strengthened	• Monitoring programme documents	Ministry responsible for Environment, Forestry, Fisheries, Health, Water, Wildlife, Tourism, Livestock, Agriculture, Local Government, COSTECH, NEMC, Academic and Research Institutions, NGOs and CBOs

TARGET 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, thereby contributing to climate change mitigation and adaptation and to combating desertification.				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
15.1 Enforce relevant policies, plans and strategies to curb negative impacts of climate change on biodiversity and desertification	2020	15.1.1 Relevant policies, plans and strategies reflecting biodiversity conservation and desertification enforced 15.1.2 Level of carbon stock increased 15.1.3 Resilience of ecosystem increased	• Policies, plans and strategies documents	Sector Ministries, Local Government, Academic and Research Institutions, Private Sector, NGOs and CBOs

Table 7-5: Strategic Goal E. Enhance implementation through participatory planning, knowledge management and capacity building

TARGET 16: By 2020, Fair and Equitable Sharing of Benefits from utilization of biodiversity resource is in force and operational, consistent with national and international legislation.				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
16.1 Ratification of Nagoya Protocol	2016	16.1.1 Nagoya Protocol ratified 16.1.2 Number of competent authorities established	• Signed and ratified protocol • Check points established	Ministry responsible for Environment, Foreign Affairs, Agriculture, Livestock, Fisheries, Forestry, Water, Wildlife, Local Government, COSTECH

16.2	Establish, implement, enforce legislation, policy, guidelines and communication strategy for Access and Benefit Sharing (ABS)	2019	16.2.1 Legislation, guidelines and communication strategy in place and being implemented 16.2.2 Level of enforcement of ABS legislation	• Legislation, guidelines and communication strategy documents • Implementation/Enforcement reports • Enforcement reports	Ministry responsible for Environment, Agriculture, Livestock, Industry, Finance, Fisheries, Forestry, Water, Wildlife, Local Government, COSTECH, Academic and Research Institutions, NGOs and CBOs
16.3	Promote and strengthen TK that enhances biodiversity conservation	2018	16.3.1 ABS framework in place 16.3.2 ABS protocols in place 16.3.3 Number of TK identified and promoted	• ABS framework document and implementation reports • Protocol document • Reports	Ministry responsible for Environment, Agriculture, Livestock, Industry, Finance, Fisheries, Forestry, Water, Wildlife, Local Government, COSTECH, Academic and Research Institutions, NGOs and CBOs
16.4	Promote PIC and MAT to ensure that Tanzania benefits from transfer of its genetic resources	2020	16.4.1 Number and type of benefits from PIC and MAT	• Cooperation agreements/MoUs • Reports	Ministry responsible for Environment, Agriculture, Livestock, Fisheries, Forestry, Water, Foreign Affairs, EAC, Lands, Wildlife, Local Government, COSTECH, Academic and Research Institutions, NGOs and CBOs
TARGET 17: By 2016, Tanzania has adopted as a policy instrument, and has commenced implementing an effective, participatory and updated National Biodiversity Strategy and Action Plan.					
Priority actions for intervention		**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
17.1	Strengthen administrative mechanism to support the focal point in the implementation of NBSAP	2016	17.1.1 Administrative mechanism strengthened	• Document and implementation report	Sector Ministries, Local Government; Private sector; Research and Academic Institutions; NGOs and CBOs

17.2	Mainstream biodiversity into sector policies, plans and strategies	2016	17.2.1 Number of reviewed sector policies, plans, strategies mainstreamed	• Reviewed sector policies, plans, strategies documents	Sector Ministries, Local Government; Private sector; Research and Academic Institutions; NGOs and CBOs
17.3	Develop capacity and ensure compliance with biodiversity related MEAs	2016	17.3.1 Number of capacity building initiatives 17.3.2 Number of MEAs implemented	• Capacity building programmes reports • List of trainees • Implementation reports	Ministry responsible for Environment, Foreign Affairs
17.4	Adopt and implement updated NBSAP	2016	17.4.1 Updated NBSAP adopted	• NBSAP documents • Implementation plan	Sector Ministries, Local Government; Private sector; Research and Academic Institutions; NGOs and CBOs
17.5	Develop and Implement Biodiversity Strategy and Action (BSAPs) at Sectoral and Local Government levels	2016	17.5.1 Sector and Local BSAPs in place and being implemented	• Sector and Local BSAPs documents • Implementation plan	Sector Ministries, Local Government; Private sector; Research and Academic Institutions; NGOs and CBOs
TARGET 18: By 2020, traditional knowledge, innovation and practices relevant for the conservation and sustainable use of biodiversity respected and safeguarded.					
Priority actions for intervention		**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
18.1	Promote use of traditional knowledge that enhance biodiversity conservation	2020	18.1.1 Number of traditional knowledge practices documented and promoted	• Reports	Ministry responsible for Forestry, Fisheries, Wildlife, Water, Energy, Environment, Agriculture, Livestock, Local Government, Community Development, Private Sector, NGOs and CBOs

18.2	Promote the use of sacred areas (e.g. forests) that benefit biodiversity conservation	2020	18.2.1 Number of sacred areas with management plans that incorporate biodiversity conservation promoted	• Implementation reports	Ministry responsible for Forestry, Fisheries, Wildlife, Water, Environment, Agriculture, Livestock, Local Government, Community Development, Private Sector, NGOs and CBOs
18.3	Strengthen mechanisms for controlling traditional practices/taboos harmful to biodiversity	2020	18.3.1 Number of harmful traditional practices/taboos identified 18.3.2 Control mechanism in place	• Reports • Implementation reports	Ministry responsible for Forestry, Fisheries, Wildlife, Water, Environment, Agriculture, Livestock, Local Government, Community Development, Private Sector, NGOs and CBOs
18.4	Establish mechanism for involvement of traditional leadership in local planning	2017	18.4.1 Mechanism for involving traditional leadership in place 18.4.2 Number of traditional leaders involved	• Partnership/MoU • Implementation reports	Ministry responsible for Forestry, Fisheries, Wildlife, Water, Environment, Agriculture, Livestock, Local Government, Community Development, Private Sector, NGOs and CBOs
18.5	Strengthening strategies to promote and preserve cultural heritage	2016	18.5.1 Strategies to promote and preserve cultural heritage strengthened	• Strategy document	Ministry responsible for Forestry, Fisheries, Wildlife, Water, Environment, Agriculture, Livestock, Local Government, Community Development, Private Sector, NGOs and CBOs

TARGET 19: By 2020, significant increase in the contribution of knowledge, technology and scientifically based information generated and shared.				
Priority actions for intervention	**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
19.1 Undertake needs assessment exercise to identify biodiversity related research gaps	2017	19.1.1 Biodiversity priority needs for research established	• Report on identified needs/existing gaps	Ministry responsible for Environment, Wildlife, Fisheries, Forestry, Research and Academic Institutions, Private sector, NGOs and CBOs
19.2 Establish Clearing House Mechanism (CHM) for biodiversity	2016	19.2.1 CHM established and functional	• CHM website • Implementation reports	Ministry responsible for Environment Sector Ministries, Local Government, Private sector, Academic and Research Institutions, NGOs and CBOs
19.3 Develop capacity for CHM in Sector Ministries	2017	19.3.1 Number of capacity building initiatives 19.3.2 Number of trained personnel	• Reports • List of trainees	Ministry responsible for Forestry, Fisheries, Wildlife, Environment, Agriculture, Livestock, Private Sector, COSTECH and NEMC, NGOs and CBOs
19.4 Strengthen capacity on undertaking biodiversity targeted research	2020	19.4.1 Number of biodiversity targeted research in place 19.4.2 Number of scientific publications and reports with key findings on biodiversity issues	• Reports and publications	Ministry responsible for Environment, Wildlife, Fisheries, Forestry, Science and Technology, Research and Academic Institutions, Private sector, NGOs and CBOs, COSTECH.

19.5	Establish a National platform for dissemination of biodiversity related information to policy and decision makers (biodiversity related websites, portals and databases)	2017	19.5.1 A functional national platform in place 19.5.2 Number of information products adopted by policy makers 19.5.3 Number of websites, portals and database	• Reports • Publications, articles, newsletters and newspapers	Ministry responsible for Environment, Wildlife, Fisheries, Forestry, COSTECH, Research and Academic Institutions, Private sector, NGOs and CBOs
19.6	Strengthen linkages between enterprise, research, public and private sector	2020	19.6.1 Number of cooperating institutions 19.6.2 Number of forums in place 19.6.3 Number of research outputs being utilized	• Cooperation agreements/MoUs • Reports and publications	Ministry responsible for Environment, Wildlife, Fisheries, Forestry, Natural resources, Enterprise, Research and Academic Institutions, Private sector, NGOs and CBOs
19.7	Create inventory on projects that address biodiversity	2020	19.7.1 Number of projects identified	• Inventory reports	Ministry responsible for Environment, Wildlife, Fisheries, Forestry, Water, Energy, Agriculture, Research and Academic Institutions, Private sector, NGOs and CBOs
19.8	Promote relevant policy interventions through briefs	2020	19.8.1 Number of policy briefs disseminated	• Reports	Ministry responsible for Environment, Wildlife, Fisheries, Forestry, Research and Academic Institutions, Private sector, COSTECH, NGOs and CBOs

19.9	Conduct impact evaluation to gauge outcomes of interventions	2020	19.9.1 Number of impact evaluation studies	• Impact evaluation reports	Ministry responsible for Environment, Wildlife, Fisheries, Forestry, Research and Academic Institutions, Private sector, NGOs and CBOs
19.10	Promote dissemination of research findings on biodiversity	2020	19.10.1 Number forums, and outlets from all media platforms 19.10.2 Number of feedbacks	• Reports	Ministry responsible for Wildlife, Local Government, Environment, Forestry, Livestock, Academic and Research Institutions, COSTECH, NEMC, Private Sector, NGOs and CBOs
19.11	Establish and collate generation of information on linkages between biodiversity and gender	2017	19.11.1 Number of linkages on gender and biodiversity 19.11.2 Information on biodiversity and gender in place	• Reports	Ministry responsible for Environment, Community Development, Gender and Children
19.12	Develop legal and administrative framework for emerging technologies	2018	19.12.1 Framework in place	• Framework document	Ministry of Environment; Sector Ministries, Local Government; Private sector; Research and Academic Institutions; NGOs and CBOs, COSTECH
19.13	Build capacity for development, promotion, commercialisation and management of emerging technologies	2020	19.13.1 Number of capacity building initiatives 19.13.2 Number of trained personnel	• Reports • List of trainees	Sector ministries; Private sector; Research and Academic Institutions, COSTECH

19.14	Develop strategies for deployment of approved emerging technologies	2018	19.14.1 Strategies developed	• Strategy document	Ministry of Environment; Sector Ministries, Local Government; COSTECH, Private sector; Research and Academic Institutions; NGOs and CBOs
TARGET 20: By 2020, financial resources in support of biodiversity programmes significantly increased.					
Priority actions for intervention		**Time frame**	**Performance indicators**	**Verifier**	**Implementing institution**
20.1	Develop and Implement a resource mobilization strategy and plan to increase biodiversity funding	2016	20.1.1 Strategy and action plan in place	• Strategy and action plan document • Implementation plan document	Sector Ministries, Local Government; Private sector; Research and Academic Institutions; NGOs and CBOs
20.2	Incorporate biodiversity issues in annual planning and budgeting	2018	20.2.1 Number of planning processes reflecting biodiversity	• Annual work plans • Approved budgets	Sector Ministries, Local Government; Private sector; Research and Academic Institutions; NGOs and CBOs
20.3	Explore, analyse and negotiate financing options	2016	20.3.1 List of funding options	• Report	Sector Ministries, Local Government; Private sector; Research and Academic Institutions; NGOs and CBOs
20.4	Develop fundable proposals to address issues as identified in the NBSAP and National Priorities	2020	20.4.1 Number of funded proposals	• Proposal documents • Funding agreements	Sector Ministries, Local Government; Private sector; Research and Academic Institutions; NGOs and CBOs

20.5	Strengthen and expand partnerships with regional and International organizations on biodiversity issues	2020	20.5.1	Number of partnerships established	• Signed cooperation/MoUs • Reports	Sector Ministries, Local Government; Private sector; Research and Academic Institutions; NGOs and CBOs

CHAPTER EIGHT

IMPLEMENTATION MECHANISM, MONITORING, EVALUATION AND REPORTING

This chapter presents an overview of the framework arrangement to be set up for implementation, capacity needs, communication and outreach, resource mobilisation, clearing house mechanism as well as monitoring and evaluation of the NBSAP. To realise the NBSAP a detailed implementation plan is to be drawn up by the various actors from different levels.

8.1 Implementation Arrangement

Implementation arrangements for biodiversity related issues in Tanzania including NBSAP is guided by the Environmental Management Act (EMA), 2004. NBSAP implementation will also benefit from environmental sections present in each sector ministry.

At the national level, the Ministries and Departments are responsible for the general implementation of the strategies through facilitating participatory formulation, development and implementation of sector policies and legislation. The MDAs will also be responsible for interpretation of NBSAP into their sectors (and formulate sector BSAPs) and the preparation of projects, programmes, strategies and budget for the strategic interventions relevant to their respective sectors based on the strategic interventions identified in the strategy. The Prime Minister's Office-Regional Administration and Local Government (PMORALG) will work closely with Local Government Authorities (LGAs) through their various departments in collaboration with lined sector ministries to implement the strategic interventions at local level.

Successful implementation of NBSAP also requires enhanced engagement with NGOs, CSOs, Private Sector, and Academic and Research institutions. Implementation of NBSAP will also benefit from the existing committees within municipalities, districts, wards, villages and sub-village that coordinate environment management.

National Administrative Mechanism

The administration of the NBSAP (2015-2020) can benefit utilisation of existing administrative mechanisms for biodiversity conservation and sustainable use such as NEAC, Environmental working group (EWG), Wetlands Technical committee (WTC) that serve in advisory and technical roles.

However, for effective administration a mechanism to support the CBD focal point and ensure adequate coordination in decision-making and planning amongst ministries, government agencies, local authorities, non-state actors and

the public at large need to be established. Two committees, i.e. a National Biodiversity Steering Committee (NBSC) and a National Biodiversity Technical Committee (NBTC) are to guide the coordination and implementation of NBSAP.

National Biodiversity Steering Committee (NBSC): The NBSC shall provide policy guidance to the CBD Focal Point and ensure coordination of actions as well as cross-sectoral participation. The NBSC will be an inter-ministerial committee with the following composition: Permanent Secretaries (PS) from sector ministries responsible for Energy, Finance, Industry, Natural Resources, Justice and Constitutional Affairs Land, Agriculture, Livestock Development, Foreign Affairs and International Cooperation.

The National Biodiversity Technical Committee (NBTC): The NBTC shall provide technical advice to the CBD Focal Point and will be charged with overseeing all technical issues related to biodiversity conservation including the implementation of NBSAP. Its composition will include Directors of various ministries.

The two committees shall also have representation from the Private Sector, NGOs and other relevant statutory bodies.

8.2 Implementation Capacity

Effective implementation of the NBSAP and associated sub-entities BSAPs requires adequate professional staff, infrastructure and continuous financial and technical support. Existing capacity is inadequate to facilitate effective and efficient implementation of NBSAP. The inadequacies include human, financial, infrastructural and other material resources. Therefore, capacity building for the broad range of actors takes a central focus in particularly the following areas:

i) Coordination institution for biodiversity related issues,
ii) Development and implementation of sub-national BSAPs,
iii) CHM, ABS and ecosystem and biodiversity valuation;
iv) Development, promotion, commercialization and management of emerging technologies,
v) Management of aquatic resources, protected areas, genetic diversity and pollution.

A National Capacity Self-Assessment (NCSA) is key to the establishment of a robust capacity building implementation programme, for human resource, infrastructure, technology transfer, business and social processes at all levels of administration.

8.3 Communication and Outreach

Communication and outreach is key for implementation of the NBSAP. Public awareness is to be addressed through educational platforms such as, workshops, seminars, public meetings, conferences, “seeing is believing” tours,

and participation in national and international days with themes related to biodiversity. Mass Media platforms like radio, television, newspapers, sectoral websites, social media, e-mail complement the educational platforms and enable broader audience access repackaged information on the NBSAP.

In order to guide the communication and outreach, utilisation of the basic principles from the National Environmental Communication Strategy will benefit the NBSAP (2015-2020).

8.4 Resource Mobilization for Implementation

Effective implementation of NBSAP in Tanzania will depend on various sources including government subventions, bilateral and multilateral agreements, grants, private sector and individual contributions.

Existing and Potential Sources of Funds

The potential sources of internal funds include revenue collected by the Government through taxes and charges from various investments associated with biodiversity and ecosystem utilization. Such funds are allocated to various MDAs and Local Government Authorities through their Medium Term Expenditure Framework that will be reflected in their budgets. Implementation of sectoral BSAPs can be supported under this arrangement. Other sources of domestic funds include established funds such as National Environmental Trust Fund, Forest Trust Fund, Wildlife Fund Payments for Environmental Services (for example, Payment for Ecosystem Services-PES); funds obtained through Public Private Partnership and funds from local NGOs.

Potential sources of funds for NBSAP implementation from the international community include GEF, the World Bank, EU, USAID, CIDA, Sida, DANIDA, among others. GEF serves as financial mechanism for a number of conventions including Convention on Biological Diversity (CBD). In undertaking its activities, GEF operates with its agencies that include: the United Nations Development Programme (UNDP); United Nations Environment Programme (UNEP); Food and Agricultural Organization of United Nations (FAO), United Nations Industrial Development Organizations (UNIDO), International Fund for Agricultural Development (IFAD), Global International Water Association Fund, (GIWA) the European Bank for Reconstruction and Development and the Inter-American Development Bank. Other potential sources of funds include Bilateral Funds and General Budget Support (GBS). NBSAP implementation can also benefit from financial support directed at specific themes such as climate change.

8.5 Clearing House Mechanism (CHM)

Tanzania is developing its national Clearing-House Mechanism (CHM) under the Ministry responsible for Environment. The CHM will support implementation of the NBSAP in various ways, including the following:

a) Strengthening coordination and collaboration among key stakeholders;
b) Increase public awareness on the status of biodiversity and NBSAP implementation;
c) The NBSAP could be uploaded to the CHM website with means of measuring the progress of implementation of the national action plans; and
d) Provision of reliable and accurate biodiversity information relevant to sound decision-making on the sustainable utilization of Tanzania's biodiversity.

There is a need to establish more biodiversity information centres in different institutions and to strengthen the existing information centres and databases in the country. A mechanism should be put in place for these information centres and databases to feed into the national database and website.

8.6 Monitoring and Evaluation

Regular monitoring and evaluation of the implementation of the NBSAP is essential, as it will ensure that the national objectives and international obligations are met. The monitoring and evaluation will be carried out in a participatory manner and on a continuous basis. Sectors will prepare and present periodic reports of their monitory activities to the national focal point. It is expected that the monitoring process will generate progress reports, which will later feed into the evaluation process. Measuring progress on the implementation plan will be based on the various criteria, indicators and verifiers (Tables 7-1 to 7-5) for each target as shown in the Action Plan.

Evaluation of NBSAP implementation will be done in two phases. Phase one will be the midterm review to be undertaken on the third year of the implementation process thus to allow for possible amendments and/or actions necessary to improve performance before end of the process. Phase two will be final evaluation to be undertaken at the end of the fifth year where the action plan of NBSAP will be gauged in terms of its relevance, effectiveness, efficiency, impact and sustainability. It is important to note that the evaluation process is very much banking on the availability of information from monitoring. The evaluation report will establish a basis for further planning and revision of NBSAP.

This NBSAP shall be revised after every five years. Revision should take into account strategy and programmes evaluation reports.

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APPENDICES

APPENDIX 1: SELECTED ENDEMIC SPECIES OF TANZANIA

Species of limited occurrence warrant additional attention for conservation. Tanzania is home to several endemics across flora and fauna taxa some that are threatened by extinction if measures are not effective to ensure their existence. Some endemics from the different groups of organisms are presented below to allow the reader an appreciation of the extent of endemism in the country. Notably a large portion of the endemism observed is hosted in the EAMs.

a) Plants

African Violets of genus *Saintpaulia* (e.g. *Saintpaulia shumensis* and *S. Goetziana*), the Usambara mountains endemic *Allanblackia stuhlmannii,* orchids (*Neobenthamia* and *Sphyrarhynchus*), trees (genus *Mwasumbia* and *Sanrafaelia*) and succulents (*Aloe dorotheae*).

b) Birds

The Usambara Eagle-owl, the Pemba Scops-owl, the Gray-breasted Francolin, the Masked Lovebird which has now been introduced into Kenya and Burundi, the Pemba Green-pigeon, the Uluguru Bush-shrike, the Banded Green Sunbird, the Pemba Sunbird, the Iringa Akalat, the Kilombero Weaver, Beesley's Lark, the Pemba White-eye, the Usambara Hyliota, Reichenow's Batis, the Kipengere Seedeater, and the recently described Rubeho Warbler *Scepomycter rubehoensis* (threatened) and Ruaha Red-Billed Hornbill *Tockus ruahae*. The Udzungwa Forest-partridge *Xenoperdix udzungwensis* is an endemic genus and species.

c) Arthropods

Papilio ufipa, *Charaxes usambarae*, *Acraea punctimarginea*, *Euphaedra confina Anthene leptala*, *Anthene madibirensis*, *Anthene ukerewensis*, and the Tanzanian Diadem *Hypolimnas antevorta*. Other endemic insects include many beetles from the Uluguru Mountains including *Euripogena leleupi*, *Euripogena rotundicollis* and *Euripogena uluguruana*. Wells and Anderson (2000) list more than 20 species of caddisflies (Trichoptera), most from the Usambara and Uluruguru forests. Some species such as *Euxanthe wakefieldi, Papilio polystratus* and *Salamis parhasus* are forest dependent hence vulnerable to deforestation.

d) Reptiles

Kinyongia oxyrhina (Uluguru One-horned Chameleon), Giant Fischers (*Kinyongia matschiei*) and the Three Horned Chameleon (*Trioceros deremensis*), Turquoise Dwarf Gecko (*Lygodactylus williamsi*), Pemba Day Gecko (*Phelsuma parkeri*), Ukinga Girdled Lizard (*Cordylus ukingensis*), Ornate Shovelsnout Snake (*Prosymna ornatissima*), Werner's Green Tree Snake (*Dipsadoboa werneri*), Usambara Garter Snake (*Elapsoidea nigra*), Matilda's horned viper (*Atheris matildae*), and Horned Bush Viper

(*Atheris ceratophora*). Additionally, three reptile genera (*Loveridgea*, *Xyelodontophis* and *Adenorhinos*) are endemic to the country (Gideon *et al*., 2012).

e) Amphibians

The Mazumbai warty frog (*Callulina kisiwamsitu*), Barbour's forest tree frog (*Leptopelis barbouri*), Uluguru banana frog (*Afrixalus uluguruensis*), Usambara big-fingered (*Probreviceps macrodactylus*), Keith's striped frog (*Phlyctimantis keithae*), Mette's Reed Frog (*Hyperolius pseudargus*), the running frog (*Kassina jozani*), The Usambara torrent frog or Tanzania rocky river frog (*Arthroleptides martiensseni*), Nike's Squeaker (*Arthroleptis nikeae*), the Kihansi spray toad (*Nectophrynoides asperginis*), Tree toad (*Churamiti maridadi*), Usambara Blue-bellied Frog (*Hoplophryne rogersi*), Amani Forest Frog (*Parhoplophryne usambarica*), Scarlet-snouted Frog (*Spelaeophryne methneri*). The last five are also endemic genera.

f) Mammals

The country is home to about 20% of Africa's large mammals. Endemic mammals include the Primates (Sanje Mangabey monkey (*Lophocebus kipunji*) in Udzungwa Mountains, the subspecies Sanje Crested Mangabey, Uhehe - Gordon's Bay Colobus, Zanzibar Colobus; shrews (Peter's musk Shrew, Amani Musk shrew, Uluguru Musk Shrew, Usambara Musk Shrew, Tanzania Mouse Shrew and Uluguru Forest Shrew); Fruit-eating bats (Pemba flying fox), Insect-eating bats (Tanzania Woolly bat, Dar es Salaam Pipistreslle); and Rodents (Mt. Kilimanjaro Mole Rat and Swynnerton's Bush Squirrel).

APPENDIX 2: SECTOR POLICY OBJECTIVES IN NATIONAL ENVIRONMENTAL POLICY, 1997

Sector	Environmental Policy Objectives
1. Forestry	• Natural forest with biological diversity value and genetic resources shall be conserved; account will be taken of the dangers of monoculture and to the extent possible natural forests will not be replaced by exotic species.
2. Wildlife	• Wildlife resources shall be protected and utilized in a sustainable manner on the basis of careful assessment of natural heritage in flora and fauna fragile ecosystems, sites under pressure and endangered species, with participation of, and benefits to, the local communities. • Game ranching and captivity breeding for certain species will be encouraged.
3. Fisheries	• Fisheries shall be developed in a sustainable manner, by using appropriate fishing gear and processing methods; • Destructive fishing and processing methods shall be controlled by regulation and support i.e. making available appropriate fishing gear at affordable prices for fishermen; specifically, blast fishing and the use of poisonous chemicals in fishing shall be severely combated; • Alternative fish processing methods shall be promoted to avoid deforestation due to fish smoking; • Introduction of non-indigenous species shall be controlled; • Fragile ecosystems and endangered species will be protected through proper fisheries management, mitigation/prevention of coastal and waterways degradation, and control of industrial pollution.
4. Tourism	• Tourism development will be promoted based on careful assessment of the carrying capacity and prior Environmental Impact Assessment application. • Environmentally friendly tourism (ecotourism) and diversification of tourism activities will be promoted.
5. Agriculture	• Minimization of encroachment in public lands including forests, woodlands, wetlands and pastures; • Promotion of mixed farming, to intensify biological processes on farmlands through multiple cropping, intercropping, crop rotation and agro-forestry.
6. Livestock	• Improvement and conservation of grazing lands and preservation of feed resources; • Promotion of mechanisms for resolving conflicts among different land use interests (wildlife protection, forestry, pastoralism and agriculture).

Sector	Environmental Policy Objectives
7. Water and Sanitation	• Planning and implementation of water resources and other development programmes in an integrated manner and in ways that protect water catchment's areas and their vegetation cover; • Improved management and conservation of wetlands; • Prevention, reduction and control of pollution of the marine and coastal waters, including that from land-based sources of pollution.
8. Energy	• Minimization of wood fuel consumption through the development of alternative energy sources and wood fuel energy efficiency; • Promotion of sustainable renewable energy resources.
9. Mining	• The mining project cycle (including reclamation and restoration of land after use) shall be adequately managed to minimize adverse environmental impacts; • Regular and periodic environmental audits shall be maintained to ensure the adoption of environmentally sound practices in mining operations.
10. Industry	• Application of environmental impact assessment (EIA) as an essential element in industrial planning and development for taking account of potentially harmful activities on the environment; • Environmental audits/inventory shall be carried out for both new and existing industries for pollution control and waste minimisation; • Workers health shall be adequately protected from environmental health hazards; • A review will be made of laws, rules, and regulations governing importation, manufacture, transportation, handling, use, storage and disposal of toxic chemicals, and dangerous products, hazardous wastes and hazardous substances, as appropriate; and • Permissible noise levels in noise-prone industries and construction sites will be prescribed.
11. Human Settlement	• Integrated planning and improved management of urban centres and designation of urban land uses based on environmental impact considerations; • Development of gardens, parks, open spaces in urban centres for public use; greenbelts with pollution tolerant species; and more generally, planting of shade-giving and fruit-bearing as well as ornamental trees along urban roads, school compounds, hospitals, government and private office building compounds, peripheries of play grounds, water bodies, places of worship, assemblies, markets, etc.; • Promotion of resource-based strategies in the planning and development of human settlements;

APPENDIX 3: INVASIVE SPECIES RECORDED IN TANZANIA

Type	Name of Invasive alien species	Typical areas of occurrence
i) Plant Pathogens	1 Grey leaf spot (*Cercospora zeae-maydis)*	Southern highlands (Iringa, Mbeya, Rukwa and Ruvuma); and Northern zone (Arusha and Kilimanjaro)
	2 Coffee Berry Disease *(Colletotrichum coffeanum)*	Northern (Kilimanjaro and Arusha); Southern highlands (Mbeya, Iringa, Ruvuma and Rukwa)
	3 *Mycosphaerella fijiensis* fungus Black Sigatoka or Black leaf Streak disease	Lake (Kagera, Mwanza and Mara), Northern (Arusha and Kilimanjaro), Southern highlands (Iringa, Mbeya, Rukwa and Ruvuma), Eastern (Tanga, Coast, Dar es Salaam and Morogoro) and Western (Tabora and Kigoma) zones
	4 Maize Chlorotic Mottle Virus	Kilimanjaro, Manyara, Mara and Simiyu regions
	5 Banana Xanthomonas Wilt (*Xanthomonas campestris var. Musacearum)*	Kagera, Kigoma and Mara (Tarime) regions
ii) Invertebrate (Insect) pests	6 Larger grain borer (*Prostesphanus truncatus*)	Northern (Arusha and Kilimanjaro); Western (Tabora and Kigoma); Eastern (Tanga, Coast, Dar es Salaam and Morogoro); Central (Dodoma, Singida); and Southern (Iringa, Mbeya, Rukwa and Ruvuma)
	7 Cassava mealy bug (*Phenacoccus manihot*)	Ruvuma, Kigoma, Dodoma and Mara
	8 Cassava green mites (*Mononychellus tanajoa*)	Lake zone (Kagera, Mwanza and Mara)
	9 citrus woolly white fly (*Aleurothrixus flocossus*)	Eastern (Tanga, Coast, Dar es Salaam and Morogoro); Southern (Mtwara and Lindi); Central (Dodoma, Singida); Western (Tabora and Kigoma); Lake (Kagera, Mwanza and Mara); Northen (Arusha and Kilimanjaro); Southern highlands (Iringa, Mbeya, Rukwa and Ruvuma)
	10 Banana weevil (*Cosmopolites sordidus*)	Lake(Kagera, Mwanza and Mara); Northern (Arusha and Kilimanjaro); Southern highlands (Iringa, Mbeya, Rukwa and Ruvuma); Eastern (Tanga, Coast, Dar es Salaam and Morogoro) and Western (Tabora and Kigoma)
	11 Stem borer - beetle (*Chilo partellus*)	Eastern zone (Tanga, Dar es Salaam and Morogoro); Western (Tabora and Kigoma); Lake (Mwanza Shinyanga); Southern highlands (Iringa, Mbeya, Rukwa and Ruvuma)
	12 Sugarcane white grub (*Phyllophaga smithi*)	Eastern (Tanga, Coast, Dar es Salaam and Morogoro); Kagera; Kilimanjaro
	13 Diamondback moth (*Plutella maculipennis*)	Kilimanjaro, Arusha, Tanga, Iringa, Dodoma, Mbeya, Morogoro and Mwanza Regions
	14 Cypress aphid *(Cinara cupressiviora)*	Countrywide

Type	Name of Invasive alien species	Typical areas of occurrence
	15 Fruit fly (*Bactrocera invadens*)	Eastern (Tanga, Coast, Dar es Salaam and Morogoro); Northern (Arusha and Kilimanjaro); Southern highlands (Iringa, Mbeya, Rukwa and Ruvuma); and Western zones (Tabora and Kigoma)
	16 Spiralling white fly (*Aleurodicus dispersus*)	Countrywide
	17 Tomato spider mite (*Tentranchycus evansi*)	Kilimanjaro, Arusha, Tanga, Iringa, Dodoma, Mbeya, Morogoro and Mwanza Regions
iii) Vertebrate pests	18 Indian house crow (*Corvus splendens*)	Coastal zone (Dar es Salaam, Tanga, Morogoro and Pwani)
	19 Black roof rat (*Rattus rattus*)	Countrywide
	20 House sparrow (*Passer domesticus*)	Countrywide
iv) Weeds - Aquatic	21 Water hyacinth (*Eichhornia crassipes*)	Lake Victoria; Kagera River; Pangani River; Sigi River; Lake Jipe
	22 Water lettuce (*Pistia stratiotes*)	Sigi River; Lake Victoria; Serengenti National Park
	23 Giant salvinia or kariba weed *(Salvinia molesta)*	Lake Manyara; Ngorongoro Conservation Area
	24 Water ivy (*Ipomoea aquatic*)	Sigi River
v) Weeds - terrestrial	25 Lantana (*Lantana camara*)	Eastern Arc Mountains; Amani Nature Reserve
	26 Cat-tail (*Typha domingensis*)	Lake Jipe
	27 Mexican poppy (*Argemone mexicana*)	Serengeti National Park; Manyara National Park
	28 Mexican marigold (*Targetes minuta*)	Ngorongoro Conservation Area; Serengeti National Park
	29 Bitter bush (*Chromoelina odorata)*	Mara region
	30 Parthenium weed *(Parthenium hysterophorus)*	Serengeti National Park
vi) Animals/ fish species	31 Nile perch (*Lates niloticus*)	Lake Victoria
	32 Tilapiine spp *(Oreochromis niloticus)*	Lake Victoria
	33 Tilapiine spp (*Oreochromis leucostictus*)	Lake Victoria
	34 Largemouth bass *(Micropterus salmoides)*	Lake Victoria
vii) Tree/shrub species	35 Maesopsis (*Maesopsis eminii*)	Amani Nature Reserve (Tanga); East Usambara Mountains; Ukaguru Mountains; Uluguru Mountains; Kwamkoro Forest reserve
	36 Cedrela (*Cedrela odorata*)	Kimboza Catchment Forest (Morogoro); East Usambara Mountains; Amani Nature Reserve
	37 Eucalyptus (*Eucalyptus chalcids*)	Tabora; Shinyanga; Kibaha (Pwani Region)
	38 Eucalyptus *(Eucalyptus camaldulensis)*	Ngorongoro Conservation area
	39 Black wattle (*Acacia mearnsii*)	Serengeti NP; North and South Pare Mountains
	40 Opuntia *Opuntia stricta* var. dillennii and *Opuntia monocantha stratiotes*	Serengeti National Park (Seronera)
	41 *Selaginela sp.*	East Usambara mountains
	42 Common thorn apple (*Datura stramonium*)	Ngorongoro Conservation Area

Type	Name of Invasive alien species	Typical areas of occurrence
	43 Spectacular Cassia *(Senna spectabilis)*	Mahale Mountains National Park (Kigoma Region)
	44 Chinese or strawberry guava (*Psidium cattleianum*)	East Usambara Mountains; Amani Nature Reserve
	45 Hill raspberry or Ceylon raspberry or Mysore raspberry or snowpeaks raspberry *(Rubus niveus)*	Ukaguru Mountains; Uluguru Mountains; Udzungwa Mountains;
	46 Mauritius Raspberry *(Rubus rosifolius)*	Amani Nature Reserve; East Usambara Mountains
	47 Teak *(Tectona grandis)*	Udzungwa Mountains
	48 African oil palm *(Elaeis guineensis)*	East Usambara Mountains; Amani Nature Reserve
	49 Madake or Giant Timber Bamboo or Japanese Timber Bamboo *(Phyllostachys bambusoides)*	East Usambara Mountains; Amani Nature Reserve
	50 Soapbush or Koster's Curse *(Clidermia hirta)*	Amani Nature Reserve; East Usambara Mountains
	51 Betel nut palm *(Areca catechu)*	East Usambara Mountains; Amani Nature Reserve
	52 Sugar palm *(Arenga pinnata)*	Amani Nature Reserve; East Usambara Mountains
	53 Panama rubber (*Castilla elastic*)	East Usambara Mountains; Amani Nature Reserve
	54 Camphor tree or Camphorwood or camphor laurel *(Cinnamomum camphora)*	East Usambara Mountains; Amani Nature Reserve
	55 Spanish elm *(Cordia alliodora)*	Amani Nature Reserve; East Usambara Mountains
	56 Rubber tree *(Hevea brasiliensis)*	East Usambara Mountains; Amani Nature Reserve
	57 Bamboo piper or Cow's foot *(Piper aduncum)*	East Usambara mountains
	58 *Leucaena (Leucaena leucocephala)*	West Usambara mountains
	59 Opuntia *(Cylindropuntia exaltata)*	Serengeti National Park
	60 Malabar Plum, or plum rose or Malay apple (*Syzygium jambos)*	East Usambara mountains
	61 Sensitive plant or sleepy plant or touch-me-not plant *(Mimosa pudica)*	Amani Nature Reserve
	62 Japanese honeysuckle plant *(Lonicera japonica)*	Ngorongoro Conservation Area
	63 Mauritius Thorn (*Caesalpinia decapitala*)	Arusha National Park; Ngorongoro Conservation Area
	64 Flame vine, or flaming trumpet, or golden shower *(Pyrostegia venusta)*	East Usambara mountains
	65 White Rubber Vine Plant *(Landolphia owariensis)*	East Usambara Mountains
	66 Prosopis (*Prosopis Juliflora)*	Kilimanjaro

(Source: URT, 2014b)