



Republic of Zambia

Ministry of Tourism, Environment and Natural Resources

United Nations Convention on Biological Diversity

Fourth National Report

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EXECUTIVE SUMMARY

Zambia is endowed with an abundance of natural resources and a fairly rich biological diversity. Like other developing countries, Zambia is highly dependent on the exploitation of biological resources for the livelihood of the majority of its people especially those living in rural areas. Since the early 1980s the country has experienced increasing pressure on its biological resources leading to rapid decline and degradation. This is attributed to over exploitation and destruction from fires, pollution and other anthropogenic activities including settlements.

In response to the threats to biodiversity, Government in 1999 developed the National Biodiversity Strategy and Action Plan (NBSAP). The NBSAP is a policy framework that promotes the conservation, management and sustainable use of Zambia's biological resources and the equitable sharing of benefits from these resources by all sectors of the population. To attain this, the NBSAP pursues six strategic goals, namely:

- i). ensure the conservation of a full range of Zambia's natural ecosystems through a network of protected areas of viable size;
- ii). conserve the genetic diversity of Zambia's crops and livestock;
- iii). improve the legal and institutional framework and human resources to implement the strategies for conservation of biodiversity, sustainable use and equitable sharing of benefits from biodiversity;
- iv). develop an appropriate legal and institutional framework and the needed human resources to minimize the risks of genetically modified organisms (GMOs);
- v). ensure sustainable use and management of biological resources; and
- vi). ensure the equitable sharing of benefits from the use of Zambia's biological resources.

Each of these goals has specific objectives, strategies, activities and expected outcomes. In addition, the NBSAP was enshrined in the Fifth National Development Plan (FNDP) and other national development strategies and plans.

Zambia as a party to the Convention on Biological Diversity (CBD) is expected to prepare progress reports on the implementation of the CBD in the country. The reports are prepared by the Ministry of Tourism, Environment and Natural Resources (MTENR), which is the Focal Point institution for biodiversity management in the country. In accordance with the Convention's guidelines and requirements, this report has been prepared through wide stakeholder consultation and participation.

The overall objective of the report is to provide an opportunity to assess Zambia's progress towards the 2010 biodiversity targets, drawing upon analysis of the current status and trends in biodiversity and actions taken to implement the Convention at the national level as well as considering what further efforts are needed. The report is also expected to contribute to the preparation of the third edition of the Global Biodiversity Outlook and its by-products.

Overall Status of Biodiversity

Zambia has fourteen terrestrial ecosystems based on vegetation type which fall into four main divisions namely: forest, thicket, woodland and grassland. Forests and woodlands are predominant and cover over 60% of the country's total land area. In addition, the country has fresh water aquatic ecosystems. Anthropogenic land cover types (especially different forms of agricultural land use) with a total coverage of 14% of land area.

The aquatic ecosystem consists of natural and man-made lakes and the major perennial rivers. Man-made lakes cover about 9,000 Km². Anthropogenic ecosystems or land use/land cover types range from cropland to fallow, tree plantations and the built-up environment. The country also has important agricultural biodiversity upon which more than 600,000 households depend directly for their livelihood.

The present distribution pattern of the ecosystems in the country is a consequence of the prevailing rainfall pattern and may change in response to climate changes. There are a total of 7,774 species of organisms that occur in Zambia. Microorganisms constitute 8%, plants 47% and fauna 45% of this biodiversity. There are at least 316 plant and animal Species that are endemic to Zambia, 174 are classified rare, while 31 species are endangered or vulnerable.

The diversity of fauna has been estimated at 3,407 species of which 1,808 are invertebrates, 224 are mammals, 409 are fish species, 67 are amphibians, 150 are reptiles and 733 are birds. While the floristic diversity has been estimated at 4,600 species, 211 species of the total are endemic. Floristic diversity is dominated by herbs and woody plants.

The management of biodiversity in Zambia is by *in-situ* through a network of protected areas systems as well as *ex-situ* through storage of genetic materials in gene banks. The protected areas system consists of National Parks, Bird Sanctuaries, Game Management Areas, (GMAs), Game Ranches, Forest and Botanical Reserves, Fisheries and National Heritage Sites.

There are 19 National Parks, which cover close to 8% of the total land area, mainly established to conserve faunal biodiversity. Thirty-four (34) GMAs act as buffer zones to these parks, and cover an additional 23% of the land area. Some protected areas were threatened by illegal settlements and encroachment.

Local Forests are meant to conserve forest resources for sustainable use by local people while National Forests protect major catchment and botanical reserves and are meant to conserve biodiversity. Forests reserves in Zambia cover a total land area of about 7.2 million ha. As a result of expanding settlements and agriculture activities some forest reserves have been encroached and depleted. Consequently, government has excised and degazetted some reserves, reducing the area and number.

Fisheries management areas are intended to promote the management and sustainable utilisation of fish resources. The major fisheries management areas in Zambia are found in Lake Bangweulu Wetlands; Lukanga Swamps; Lakes Tanganyika, Mweru-wa-Ntipa, Mweru; Itetzhi-tehzi, Lusiwashu, and Kariba, as well as the Kafue, Zambezi and Luangwa Rivers.

Management of biodiversity in protected areas is the responsibility of the state. The Zambia Wildlife Authority (ZAWA) manages the National Parks and GMAs on behalf of government. The forest reserves are under the responsibility of Forestry Department while Fisheries Management Areas are managed by the Department of Fisheries. The Game ranches are managed by the Private Sector. In addition GMAs are jointly managed by ZAWA and the Local Communities through Community Resource Boards.

Biodiversity Threats

Mans' activities have remained the major threats to ecosystems in Zambia. The threats include:

- i). ***Deforestation and Habitat Destruction:*** The threat of deforestation in forest reserves is caused by excessive harvesting for both domestic and commercial use, as well as conversion of forest areas to agricultural land. Habitat destruction mostly affects *mosses* and *hydrophilous orchids* and *ferns* whose habitats have continued to be destroyed by drought, cultivation and fire. About 249 (about 51.37%) of the total forest reserves are either encroached or depleted due to over-exploitation of wood products, settlement and cultivation.
- ii). ***Wildfires:*** This is a serious problem in Zambia's biodiversity as it has become a common phenomenon in catchment ecosystems causing hydrological imbalance which is reflected in reduced water in rivers and streams during the dry seasons and floods during rainy season.
- iii). ***Land Use Conflicts:*** Human encroachment, fragmentation of ecosystems, logging, mining and agriculture pose threats to ecosystems in the wildlife estate. Land use conflicts include forests/agriculture/human settlement, and human/wildlife. The conflicts are more prevalent in GMAs than National Parks.
- iv). ***Human Encroachment:*** This has remained a main threat to ecosystems which is associated with cultivation, livestock grazing and deforestation.
- v). ***Mining and Road Construction Activities:*** These have resulted in the fragmentation of ecosystems and habitats and obstruct migratory routes to breeding and feeding grounds used by wildlife and fish.
- vi). ***Climate Change:*** Long-term change of one or more climatic elements from a previously accepted long term mean value poses a threat to biodiversity. The issue revolves around climate variability, global warming, acidification and ozone layer depletion. Climatic hazards caused by climatic change and extreme weather events are a serious threat to biological resources in the country.
- vii). ***Introduced Species:*** Some introduced species have become very invasive and pose threats to ecosystems and the indigenous species. For example, fish escaping from aquaculture is a potential threat to local fish species in the natural environment.

With regard to agriculture biodiversity, the biggest threat is the introduction of improved varieties of crops, some of which have completely replaced local varieties and landraces.

- viii). ***Pollution:*** Pollution caused by wide scale application of pesticides and herbicides to protect crops and control pests, such as tsetse flies disrupt natural food chains and negatively impact biodiversity.
- ix). ***Biodiversity Management:*** Museums, herbaria and gene-banks remained inadequate and those that exist were poorly funded and managed. This in turn poses a threat to the maintenance of plant and animal collections.

Key Actions taken in Support of the Convention's three objectives and to achieve the 2010 Target and Goals and Objectives of the Strategic Plan of the Convention

During the reporting period the following were key actions taken towards achieving the 2010 targets:

Goal 1. Promote the conservation of the biological diversity of ecosystems, habitats and biomes

- i) Fourteen ecosystems were maintained dominated by dry evergreen forests covering 59% followed by deciduous 25%, thickets 7% and Riparian 3%.
- ii) A total of 19 National Parks and 34 GMAs for wildlife management, 480 forest reserves, 59 Botanic Reserves and 11 major fisheries in form of lakes, dams and rivers were maintained as protected areas.

Goal 2. Promote the conservation of species diversity

- i). Efforts were made through enforcement of sector legislation and regulations such as wildlife and forests acts to conserve species diversity

Goal 3. Promote the conservation of genetic diversity

- i) Restocking of domesticated animals in Southern Province
- i) The Zambia Agricultural Research Institute (ZARI) continued to maintain genetic crop materials for domesticated crops.

Goal 4. Promote sustainable use and consumption

- ii) Carried out forest resource assessment for the purpose of preparing management plans for some protected areas.
- iii) Introduced co-management regulations for fishery resources in major Lakes

Goal 5. Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced.

- i) Enforcement of regulations through licensing of valuable timber species such as *Pterocarpus angolensis* and *Baikiaea plurijuga*
- ii) Elephants and poaching for this resource reduced and the population increased by 20% from what was reported in the 3rd National Report.

Goal 6. Control threats from invasive alien species

- i) Clearing of 501.6 ha of *Mimosa pigra* at Lochinvar National Park and 11.8 ha of *Lantana camara* at the Victoria Falls pilot sites.
- ii) Development of the National Invasive Species Strategic Action Plan
- iv) Development of cost-recovery mechanisms for Invasive Alien Species activities from Public and Private Sector

Goal 7. Address challenges to biodiversity from climate change and pollution

- i) Biodiversity issues and actions harmonized in the National Adaptation Programme of Action (NAPA)
- ii) Review of the Environment Protection and Pollution Control Act of 1990
- iii) The Environmental Council of Zambia (ECZ) continued to enforce Environmental Impact Assessments (EIAs) for all development activities

Goal 8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods

- i) Pilot sites in Bangweulu (Northern Province) and Chiawa (Lusaka Province) were tested under the Reclassification and Effective Management National Protected Areas Systems

Project to involve local communities and the private sector to enhance management of ecosystems

- ii) Forest reserves, national parks, GMAs and fisheries maintained

Goal 9 Maintain socio-cultural diversity of indigenous and local communities

- i) Promotion of the development and preservation of national arts and culture and promotion of expression of folklore and culture among local communities.
- ii) Traditional knowledge, innovations and practices integrated into the FNDP, Science and Technology Policy, and National Policy on Environment
- iii) Traditional healers and modern doctors carried out research on effectiveness of traditional medicines in treating HIV/AIDs.
- iv) Survey on baseline information on traditional knowledge conducted

Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources

- i) Promulgation of bio-safety policy and legislation
- ii) Commenced development of ABS legislation

Goal 11: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention

- i) Improving public sector budgeting and accounting systems
- ii) Integrating Cooperating Partner Support with National Plans
- iii) Designing national development strategies through dialogue with stakeholders including the general public, private sector and civil society
- iv) Investment in the management of biological resources

Obstacles Encountered Towards Achieving the Goals and Objectives

The following were considered as challenges:

- i). The NBSAP continued to be implemented on a sectoral approach. This negatively affected coordination, networking and linkages.
- ii). The NBSAP clocked a decade without review to include emerging issues
- iii). Weak management skills in local communities for sustainable use and management of biological resources
- iv). Limited government resources to support the implementation of the NBSAP activities encouraged continued dependence on external funding.
- v). Information dissemination remained poor at all levels (local, national and regional), thereby reducing opportunities for effective professional decision making in biological resources policy and strategies implementation.
- vi). Those using the resources rarely owned it. In the absence of ownership, long term perspectives and sustainable approaches were hard to achieve and consequently poverty and illegal activities increased.
- vii). Absence of detailed inventories upon which to base review and development of natural resources management plans.
- viii). Deforestation, wildfires, illegal hunting and over-fishing continued to be major threats to sustainable use and management of biological resources.

- ix). Encroachment of protected areas was very common throughout the country. Due to growing encroachment the country's biodiversity and other amenity values such as water were also increasingly under serious threat.
- x). Deficiencies in the legal and regulatory framework and functioning institutional set up.

Future Priorities

Implementation of biological diversity strategies and actions will need to consider the following:

- i). Review the current NBSAP to streamline it with the current national strategies and programmes and incorporate emerging issues such as climate change;
- ii). Capacity building in skills that will improve progress on the implementation of the Convention on Biological Diversity and the NBSAP objectives and activities should be intensified at all levels;
- iii). Develop monitoring tools to assist in accurate reporting of the Convention activities;
- iv). Introduce integrated approaches following an ecosystem approach taking into account existing and future programmes;
- v). Reclassification of national protected areas severely threatened with depletion.

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ABBREVIATIONS AND ACRONYMS

| | |
|----------|---|
| ADB | African Development Bank |
| ADMADE | Administrative Management Design for Wildlife Management |
| ASP | Agricultural Support Programme |
| CBD | Convention on Biological Diversity |
| CBNRM | Community Based Natural Resources Management |
| CIFOR | Centre for International Forestry Research |
| CRB | Community Resources Board |
| CPFP | Country Partnership Framework Paper |
| ECZ | Environmental Council of Zambia |
| FAO | Food and Agriculture Organisation of United Nations |
| FNDP | Fifth National Development Plan |
| FSP | Fertiliser Support Programme |
| GEF | Global Environment Fund |
| GMA | Game Management Areas |
| GMO | Genetic Modified Organisms |
| GRZ | Government Republic of Zambia |
| HIV/AIDS | Human Immuno-deficiency Virus/Acquired Immune Deficiency Syndrome |
| IRDB | Integrated Resource Development Board |
| MDGs | Millennium Development Goals |
| MENR | Ministry of Environment and Natural Resources |
| MEWD | Ministry of Energy and Water Development |
| MTENR | Ministry of Tourism, Environment and Natural Resources |
| NAP | National Action Programme |
| NAPA | National Adaptation Programme of Action |
| NBSAP | National Biodiversity Strategy and Action Plan |
| NGOs | Non Governmental Organisations |
| NORAD | Norwegian Agency for International Development |
| PA | Protected Areas |

| | |
|-------|---|
| PFAP | Provincial Forestry Action Programme |
| PPP | Public Private Partnership |
| SIDA | Swedish International Development Agency |
| UNCCD | United Nations Convention to Combat Desertification |
| UNDP | United Nations Development Programme |
| UNFCC | United Nations Framework Convention on Climate Change |
| WCS | Wildlife Conservation Society |
| WWF | Worldwide Fund for Nature |
| ZAWA | Zambia Wildlife Authority |
| ZFAP | Zambia Forestry Action Programme |

CHAPTER I

OVERVIEW OF BIODIVERSITY STATUS, TRENDS AND THREATS IN ZAMBIA

1.1 Introduction

Biological diversity is essential for sustainable socio-economic development. The variability of living organisms avails opportunities for improving peoples' lives. Zambia is endowed with an abundance of natural resources and a fairly rich biological diversity. Like other developing countries, Zambia is highly dependent on the exploitation of biological resources for the livelihood of the majority of its people especially those living in rural areas. Aquatic ecosystems are an important breeding ground for fish, a source of protein for many Zambians. Furthermore, its estimated that over 600,000 households depend directly for their livelihood on the country's agricultural biodiversity for their livelihoods.

Since the early 1980s the country has experienced increasing pressure on its biological resources leading to rapid decline and degradation. This is attributed to over exploitation and destruction from fires, pollution and other anthropogenic activities including settlements.

The Zambian government recognises the importance of the country's biodiversity and the need to protect and conserve it. In this regard Zambia signed the Convention on Biological Diversity (CBD) on 11th June 1992 and ratified it on 28th May 1993, signifying the country's commitment to management of biological diversity. Over the years the country has developed programmes and actions plans aimed at conservation and sustainable utilization of biological resources.

In response to the threats to biodiversity, Government in 1999 developed the National Biodiversity Strategy and Action Plan (NBSAP). The NBSAP is a policy framework that promotes the conservation, management and sustainable use of Zambia's biological resources and the equitable sharing of benefits from these resources by all sectors of the population. To attain this, the NBSAP pursues six strategic goals. Each of the goals has specific objectives, strategies, activities and expected outcomes. In addition, the NBSAP was enshrined in the Fifth National Development Plan (FNDP) and other national development strategies and plans.

This report was prepared through wide stakeholder consultation and participation in accordance with CBD guidelines. The overall objective of the report is to provide an opportunity to assess Zambia's progress towards the 2010 biodiversity targets, drawing upon analysis of the current status and trends in biodiversity and actions taken to implement the Convention at the national level as well as considering what further efforts are needed. The report is also expected to contribute to the preparation of the third edition of the Global Biodiversity Outlook and its by-products.

The report is divided into four chapters. Chapter I provides an overview of biodiversity status, trends and threats; Chapter II examines the current status of the National Biodiversity Strategy and Action Plan; Chapter III highlights the sectoral and cross-sectoral integration of biodiversity. Chapter IV highlights conclusions on progress towards the 2010 targets and implementation of the Strategic Plan of the Convention.

1.2. Status of Biodiversity

Biological diversity is the variability among living organisms (NBSAP, 1999). Variability occurs at the ecosystem, species and genetic levels.

Zambia has a diversity of terrestrial and aquatic ecosystems. There are fourteen terrestrial ecosystems based on vegetation type (Fanshawe, 1971). These are categorised as forest, thicket,

woodland and grassland. Woodlands are predominant and cover over 60% of the country’s total land area as indicated in Table 1. These ecosystems are dynamic due to the influence of climate and geomorphologic processes. In recent times, biotic factors, such as cultivation and fire, have played a significant role in altering the structure and functioning of these ecosystems.

Table 1: Extent of Ecosystem in Zambia

| Biome | Ecosystem | Approximate Extent | |
|---------------|--|--------------------|------------|
| | | Km ² | % |
| Forest | Dry evergreen | 15,835 | 2.10 |
| | Deciduous | 6,735 | 0.90 |
| | Thickets | 1,900 | 0.25 |
| | Montane | 40 | 0.01 |
| | Swamp | 1,530 | 0.20 |
| | Riparian | 810 | 0.11 |
| Woodland | Chipya | 15,560 | 2.07 |
| | Miombo | 294,480 | 39.13 |
| | Kalahari sand | 84,260 | 11.20 |
| | Mopane | 37,010 | 4.92 |
| | Munga | 30,595 | 4.06 |
| | Termitaria | 24,260 | 3.22 |
| Grassland | Dambo | 75,760 | 10.07 |
| | Floodplain/swamp | 129,075 | 17.15 |
| Aquatic | Lakes and rivers | 10,500 | 1.40 |
| Anthropogenic | Cropland and fallow, Forest plantations and built-up areas | 24,210 | 3.21 |
| | Total | 752,578 | 100 |

Source: MENR, 1998

Table 1 indicates that forests and woodlands ecosystems have the highest ecosystem diversity.

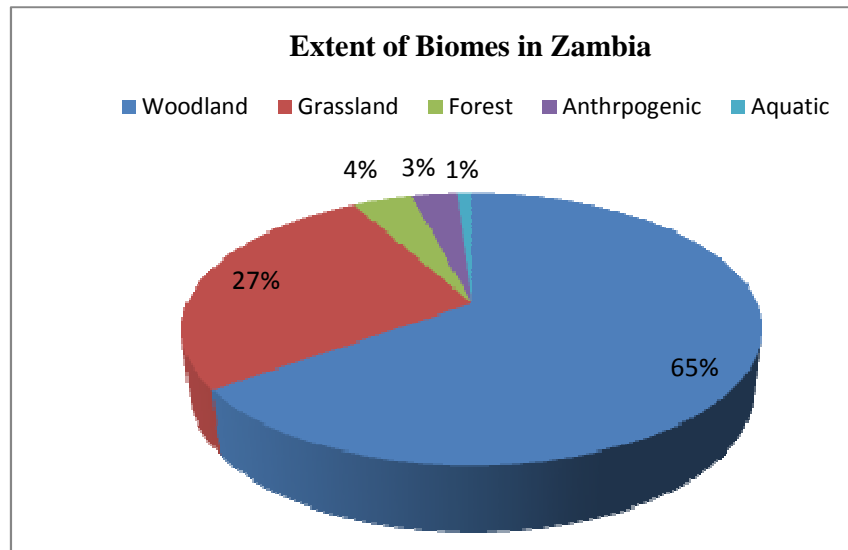


Figure 1: Extent of Biomes in Zambia (MENR, 1998)

Figure 1 shows that the woodland biome has the largest extent covering about 65% of total land area and the aquatic biome the least.

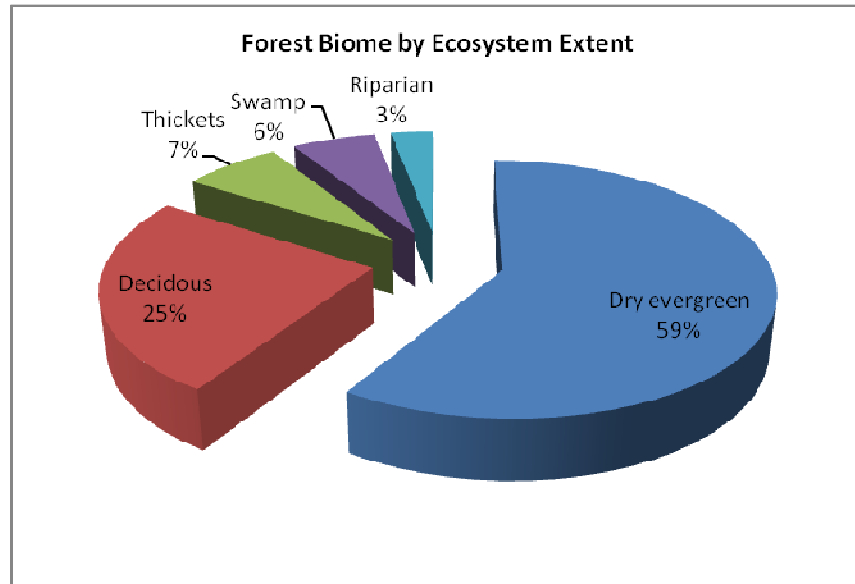


Figure 2: Forest biomes by ecosystem extent in Zambia

Figure 2 shows that in the forest biome, the Dry evergreen ecosystem is the largest (59% of the total forest biome) followed by the Deciduous Forest ecosystem (25%) and the Montane Forest ecosystem is less than 1% (Not included in the figure).

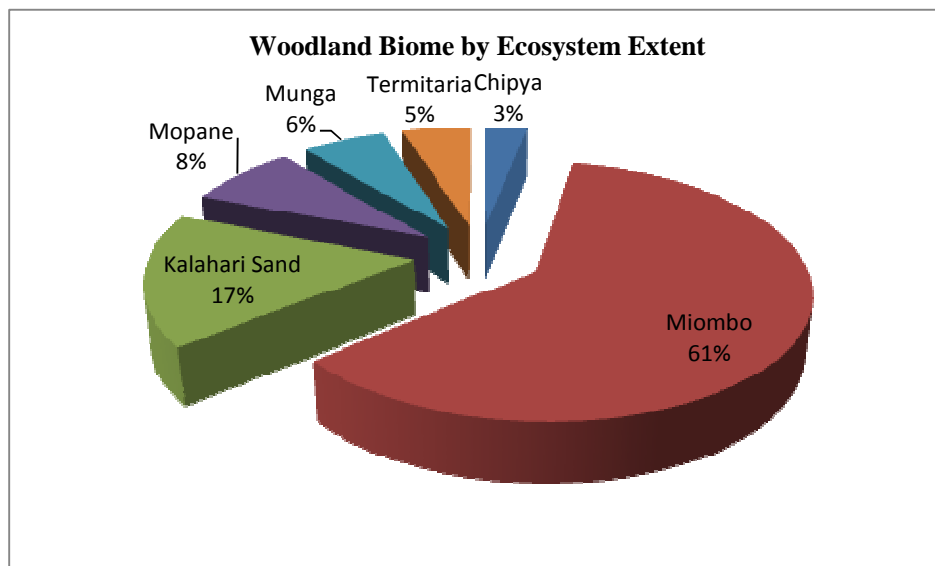


Figure 3: Woodland biome by ecosystem extent

Figure 3 shows that in the woodland biome, the Miombo ecosystem accounts for 61% while the Chipya Ecosystem is the least, accounting for 3%.

Some of the biodiversity is found in the anthropogenic land cover types, such as agricultural farm land. Anthropogenic ecosystems or land use/land cover types range from cropped to fallow land, tree plantations and the built-up environment.

The aquatic ecosystem consists of natural and man-made lakes, wetlands, pans and major perennial rivers. About 14% of the country’s land area is fresh water aquatic ecosystems, while man-made lakes cover about 1.2%.

As reported in Zambia’s Third National Report on the implementation of the CBD it is estimated that there are about 7,774 species of organisms that occur in Zambia, with micro-organisms constitute 8%, plants 47% and fauna 45% of this biodiversity. It is estimated that of these species 316 are endemic, 174 are rare, and 31 are endangered or vulnerable.

The diversity of fauna has been estimated at 3,407 species of which 1,808 are invertebrates, 224 are mammals, 409 are fish, 67 are amphibians, 150 are reptiles and 733 are birds. Floristic diversity is dominated by herbs and woody plants. There are an estimated 4,600 species of flora, of which 211 are endemic.

Between the Third and this Report, knowledge on the species still remains scanty as no comprehensive studies have been conducted to establish the current status. However, specific areas set aside for the protection of ecosystems and associated biological resources, and there status is described below.

1.2.1 National Parks and Game Management Areas

The 1998 Policy for National Parks in Zambia recognises that national parks exist for the protection of wild ecosystems and their biodiversity that exist within. There are 19 National Parks, which cover close to 6.4 million hectares which is about 8% of the total land area, established to conserve faunal biodiversity. Sustainable use of wildlife and its habitats in the national parks is promoted through eco-tourism while settlements and hunting are prohibited. There are 34 GMAs that act as buffer zones to the national parks, covering an additional 23% of the land area. Over 1.5 million people were estimated to live in these GMAs. Efforts were made to remove illegal settlers from some protected areas while other areas such as Lower Zambezi and Isangano National Parks still face problems of encroachment. Figure 4. below shows the extent of national parks and game management areas in Zambia.

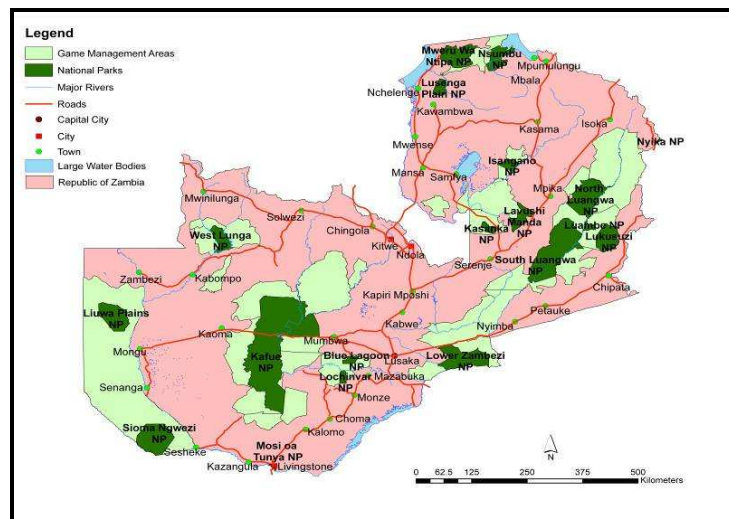


Figure 4: Wildlife Protected Areas (REMNPAS)

1.2.2 Forest Reserves

Local Forests are meant to conserve forest resources for sustainable use by local people, while National Forests protect major catchment areas, and botanical reserves are meant to conserve biodiversity. There are 480 forest reserves in Zambia covering a total land area of about 7.2 million hectares (MTENR, 2009). As a result of expanding settlements and agriculture activities some forest reserves have been encroached and depleted. Consequently government has excised and degazetted some reserves, reducing the area and number. Figure 5 below shows the extent of national and local forest reserves.

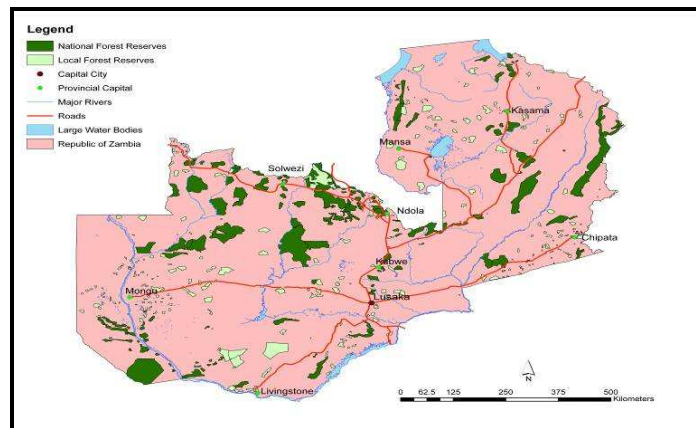


Figure 5: Forest Protected Areas (REMNPAS)

1.2.3 Botanical Reserves

Out of a total of 59 botanic reserves in the country, twenty nine (29) are either encroached or depleted, (Chidumayo 1998). These reserves are not well managed due to inadequate capacity within the Forestry Department. In most cases, the botanical reserve boundaries have remained unmaintained.

1.2.4 Fisheries Management Areas

Fisheries management areas are intended to promote the management and sustainable utilisation of fish resources. The major fisheries management areas in Zambia are Bangweulu Swamps; Lukanga Swamps; Lakes Tanganyika, Mweru-wa-Ntipa, Itetzhi-tehzi, Lusiwashi, Bangweulu and Kariba, as well as the Kafue, Zambezi, Chambeshi and Luangwa Rivers. Cumulatively these fisheries have more than 400 fish species. However, only about 17 species can be considered commercial.

Between 1970 and 1980, the per capita consumption of fish in Zambia was estimated at 12 Kg. The latest estimates have put the per capita consumption of fish at 7 Kg, a drop from the 1980 levels. The drop is attributed to the decline in fish stocks in some of the fisheries due to excessive fishing, use of bad fishing methods and inappropriate gear as well as an increase in demand due to population growth. This increase in demand has resulted in an increase in non traditional fish species on the market. Natural Fisheries contribute 90% of the fish production estimated 85,000 metric tonnes per annum.

1.3 Biodiversity Trends

Changes in ecosystem and species diversity are directly related to changes in land area under protection, encroachment and direct exploitation of biological resources. However, due to lack of recent studies on species diversity it was difficult to show a linkage between changes in protected land area and loss of species.

1.3.1 Ecosystem diversity

In 1998 the forest and woodland cover was estimated at 68% of the total land area. As a result of deforestation there is a decline in the forest and woodland cover, which now stands at about 66% (FD, 2008). The decline is attributed to establishment of new settlements, high demand for wood fuel, and expansion of agriculture land.

1.3.2 Species diversity

As of 1998, the country had a total of 7,774 species of organisms. The poaching of elephants has reduced and the numbers increased from 27,000 to 30,000 based on the animal population census conducted in 2008 (ZAWA, 2009). It was difficult to establish the actual trends of the species diversity as no recent studies or assessment have been conducted.

1.3.3 Genetic diversity

The country has genetic material and plant specimen collected from different parts of the country stored in gene banks and herbaria, respectively. All collected genetic materials are deposited at the National Plant Genetic Resource Centre for short to medium term storage and duplicate samples are deposited at the Southern Africa Development Community (SADC) Plant Genetic Resource Centre which holds the base collection for the sub-region.

The materials collected are on plant species diversity. There are reports of new species introduced into the country but no inventory has been done to identify them and quantify their impacts.

1.3.4 Protected Areas Management

About 249 (51.37%) of forest reserves are either encroached or depleted due to over-exploitation of wood products, settlement and cultivation (FD, 2008). This has resulted in the loss of forest reserves whose numbers have reduced and changed to other land uses. About 2% of the National Forests are depleted, while 46% are encroached and 52% are intact.

Table 2 indicates that 17 forest reserves have been degazetted for other land use representing about 3% of the total forest reserves area. The table shows that more local forests have been excised than national forests. Local forest on the Copperbelt, in Eastern and Lusaka Provinces are more affected than others elsewhere. This may be attributed to high urbanisation leading to high demand for forest products and land. It is expected that the opening of the new mines in North-western Province will bring pressure on the undisturbed forest reserves.

Table 2: Number and coverage of degazetted forest reserves per province

| Province | Number of Degazetted | | Size (Hectares) | |
|---------------|----------------------|-----------|-----------------|----------------|
| | National | Local | National | Local |
| Central | - | | | |
| Copperbelt | 2 | 8 | 13,075 | 60,004 |
| Eastern | - | 3 | | 83,931 |
| Luapula | - | | | |
| Lusaka | | 2 | | 4,984 |
| Northern | | | | |
| North-Western | | 1 | | 68,657 |
| Southern | | 1 | | 10,766 |
| Western | | | | |
| Total | 2 | 15 | 13,075 | 228,342 |

Source: Forestry Department (2008)

1.4 Biodiversity Threats

Zambia, like many other developing countries, experiences threats to its ecosystem, species and genetic biodiversity. The threats to biodiversity are mainly human induced and include deforestation, wildfires, mining, climate change, introduced species, pollution and inadequate capacity.

1.4.1 Deforestation

Deforestation is one of the biggest threats to ecosystem and species diversity leading to habitat destruction, changes in species composition, disruption of the food chain, and disappearance of saprophytic organisms in protected and open forest areas. Plant groups most affected include *mosses, hydrophilous orchids, ferns and fungus*.

Major causes of deforestation include; indiscriminate cutting of trees, commercial harvesting, and conversion of forest land to settlement and agricultural land through excision, degazetation and encroachment of open areas. These are driven by the high demand for forest products to provide for a growing population especially in urban areas of Central, Copperbelt and Lusaka Provinces of the country.

1.4.2 Wildfires

Fire is an important management tool in terrestrial ecosystems. However, if not properly managed, it can destroy habitats leading to changes in species composition of both flora and fauna. Wildfires are a serious problem to Zambia's biodiversity. Late fires and uncontrolled fires have become common in catchment ecosystems causing hydrological imbalance which is reflected in reduced water in rivers and streams during the dry seasons and floods during rainy season. This results into disruption of breeding patterns of aquatic organisms.

Fire is commonly caused when clearing land for agriculture, hunting for small game, production of charcoal, honey harvesting, for stimulating growth of new pasture in grazing lands. Habitats are therefore destroyed affecting species composition.

1.4.3 Land Use Change

Land use change as a threat to ecosystems is prevalent in both protected and open areas. **Triggers of land use change are influenced by human activities such as change in policy direction, encroachment, logging and mining.** Land holding significant biodiversity is increasingly being converted to other uses such as settlements, mining concessions, farm lands and other commercial developments. For example, settlements in GMAs are expanding due to population growth and migration as more land is being converted to agriculture and settlement. Ecosystems in 25% and 48% of National Parks and GMAs respectively, are degraded due to human encroachment (ZAWA, 2008). The result is loss of biodiversity due to habitat fragmentation and edge effects. Mining and road construction activities have degraded ecosystems and wildlife habitats in Lukusuzi, Lochinvar, West and East Lunga National Parks (NBSAP, 1999). These have resulted in the fragmentation of ecosystems and habitats and obstruction of migratory routes used by wildlife and fish to breeding and feeding grounds.

1.4.4 Climate Change

Climatic hazards caused by extreme weather events are a threat to biodiversity resources in the country. Droughts and floods in particular, adversely affect biodiversity resources in both terrestrial and aquatic ecosystems. In recent years floods and droughts have caused crop failure, impacted on wildlife populations and changed the honey flow period.

1.4.5 Invasive Alien Species

Some introduced species such *Lantana camara, Salvinia molesta* (Kariba Weed), *Mimosa pigra* and *Eichhornia crassipes* (Water Hyacinth) have become invasive and pose threats to indigenous

species in ecosystems. The proliferation of invasive alien species may be attributed to the non control of the movement of plant materials which end up in biodiversity hotspots.

The invasive alien species affect aquatic and terrestrial ecosystems. For example the Water Hyacinth has in some places covered extensive water surfaces affecting the populations of other aquatic flora and fauna.

The biggest threat to agro-biodiversity is the introduction of improved varieties of crops, some of which have completely replaced local varieties and landraces. Improved maize varieties have replaced local varieties in the country. It has been observed the new sorghum and sweet potatoes varieties are replacing the local varieties where these crops are grown.

1.4.6 Pollution

Pollution disrupts the natural food chains leading to negative impact on biodiversity. It also affects the reproductive cycle/patterns, triggers emigration and affects behaviour of organisms which in turn affects the composition of species. For example, the infestation of alien aquatic weeds linked to eutrophication of water bodies by industrial, domestic and agricultural pollution of rivers has highly reduced invertebrate diversity, which consists of a few pollution tolerant species (NBSAP, 1999).

Major sources of air, land and water pollution in Zambia include; wide scale application of pesticides and herbicides to control pests and waste discharge from industrial production processes (such as cement production and mining).

1.4.7 Knowledge Gaps

Museums, herbaria and gene-banks are repositories of biological resources. However in Zambia these have remained inadequate and those that exist are poorly funded and managed. There is limited ongoing research to update the depositories, thus creating a knowledge gap. This in turn poses a threat to the maintenance of plant and animal collections. Furthermore, inadequate specialised training in biodiversity management, especially in taxonomy has contributed to poor documentation and management of biodiversity in the country. The lack of mechanisms for access to and sharing of benefits from biodiversity use undermines the understanding and motivation to conserve biological resources by local people.

1.4.8 Cultural and Social Values

The value attached to biological resources emanating from tradition and culture has implications on how the resources may be used. Biological resources since time immemorial have been harvested for food, shelter, beverages, fibres, tools, medicines, religious purposes and aesthetic values. In some communities biological resources are considered as God given, hence to be harvested without any hindrances. Furthermore, exploitation of these resources is driven by customs and/or tradition for basic needs and as a source of cash income. This, coupled with inadequate regulatory mechanisms, leads to over exploitation of biological resources as well as destruction of habitats which in turn causes changes in species composition.

1.5 Implications of Observed Changes on Human Well-Being

The value and potential of biological resources to contribute to poverty reduction and economic growth in the country is significant. The threats and challenges confronting the management of biodiversity have implications on the ecology, livelihoods and socio-economic development.

The following are some of the implications of the changes in biodiversity on the human wellbeing:

1.5.1 **Ecology**

- i). The reduced forest and woodland cover has affected the hydrological cycle, soil stability, and caused siltation of water bodies e.g. Lutembwe Dam and Luangwa River in the eastern part of Zambia have been seriously affected;
- ii). Land degradation and soil erosion due to clearing of forests for agriculture purposes would lead to low production and productivity;
- iii). An increase in settlement and agriculture activities in protected areas would result in change of species composition and reduction of conservation areas;
- iv). The impact of climate change would lead to reduced capacity of the natural systems to sequester carbon, reduced ecosystem productivity and;
- v). The implication of an increase in some wildlife species, such as elephants, would lead to wildlife-human conflicts and habitat destruction while the decline in some of the predator species would lead to exponential increase in prey species.

1.5.2 **Socio-economic**

- i). The loss of forests would affect the livelihoods of the people. There would be effects on food security, energy and clean water supply. In addition, the health sector would be affected especially at community level as most of the rural communities are dependent on medicinal plants where modern healthy services are not available;
- ii). The decline in the per capita consumption of fish would lead to reduced household income, food security and nutrition; and
- iii). The loss of wildlife resources will affect the development of tourism and hence there will be loss of revenue from this economic sector.

CHAPTER II

CURRENT STATUS OF NATIONAL BIODIVERSITY STRATEGIES AND ACTION PLANS

Article 6 of the Convention on Biological Diversity (CBD) requires that all Contracting Parties develop national strategies, plans or programmes for the conservation and sustainable use of the national biodiversity. Since 1985, the Government of the Republic of Zambia has continued to take a number of policy decisions to guide the management of the environment and ensure conservation of biological resources. Since the 3rd National Report government has developed policies and strategies in support of the implementation of the NBSAP. These include, the National Capacity Self Assessment (NCSA) and Action Plan, Fifth National Development Plan (FNDP), National Adaptation Programme of Action (NAPA), National Policy on Environment (NPE), and other sector policies. This chapter provides an overview of progress in the implementation of the NBSAP priority activities including sources of domestic and international funding.

2.1 Activities in Implementing the NBSAP

Zambia finalised the NBSAP as a national strategy for implementing the Convention on Biological Diversity in 1999. The Plan provided for a national institutional framework with six strategic goals each with specific objectives as shown in Table 3 below:

Table 3: Zambia NBSAP Strategic Goals and Objectives

| Goal | Objectives |
|--|---|
| 1. Ensure the conservation of the full range of Zambia's natural ecosystems through a network of protected areas of viable livestock | i. To assess the coverage of Zambia's ecosystems in existing protected areas network in order to ensure inclusion of all major ecosystems |
| | ii. Modification of the existing protected areas network to include representative areas of viable size of all major ecosystems |
| | iii. Enhancing the effective participation of stakeholders in the management of the PA network. |
| 2. Conservation of the genetic diversity of Zambia crops and livestock | iv. To conserve the genetic diversity of traditional crop varieties and their wildlife relatives |
| | v. To conserve the genetic diversity of traditional livestock breeds |
| 3. Improve the legal and Institutional framework and human resources to implement the strategies for conservation of biodiversity, sustainable use and equitable sharing of benefits from biodiversity | i. To strengthen and develop appropriate legal and institutional frameworks for the management of biodiversity in Zambia's Pas |
| | i. To develop a co-ordination mechanism among institutions responsible for biodiversity management |
| | ii. To improve biodiversity knowledge in Zambia |
| 4. Sustainable use and management of biological resources | i. To develop and implement local management systems that promotes sustainable use of biological resources |
| | ii. To establish the maximum yields of biological resources and design and implement systems of monitoring their utilisation and management |
| 5. Develop an appropriate legal and institutional framework and needed human resources to minimise the risks of Genetically Modified Organisms | i. To ensure an appropriate institutional framework for bio-safety |
| | ii. To develop adequate human resources for biodiversity |
| 6. Ensure equitable sharing of benefits from the use of Zambia's biological resources | i. To develop and adopt a legal and institutional framework, which will ensure that benefits are shared equitably |
| | ii. To create and strengthen Community Based Natural Resource Management institutions |

The NBSAP prioritized six unmet needs for biodiversity management as outlined below:

- i) Conservation of ecosystems and protected areas;
- iii) Sustainable use and management of biological resources;
- iv) Equitable sharing of benefits arising from utilisation of biodiversity;
- v) Conservation of crop and livestock genetic diversity;
- vi) Provision of appropriate legal and Institutional framework and the needed human resources to deal with bio-safety;
- vii) Provision of appropriate legal and institutional framework and human resources to implement biodiversity programme.

2.2 Progress in the Implementation of NBSAP Strategic Goals

Zambia has made progress in the implementation of the NBSAP. The NBSAP activities focused on management of PAs, institutional strengthening and legal framework for management of biological resources (see Table 3 below).

Table 4: Progress in implementing the NBSAP Strategic Goals

| Goal 1: Ensure the Conservation of a full range of Zambia's natural ecosystem through a network of protected areas of viable size | | | | |
|--|--|--|--|--|
| <i>Objective</i> | <i>Outcome</i> | <i>Strategy</i> | <i>Activities</i> | <i>Progress</i> |
| 1. To assess the coverage of Zambia's ecosystems in the existing protected areas network in order to ensure the inclusion of all Zambia's major ecosystems | Report on the adequacy of the coverage of the existing protected areas network and identification of unprotected areas that need to be gazetted as protected areas | Carry out a gap analysis and up-date maps of all the remaining natural ecosystems of Zambia | <ol style="list-style-type: none"> 1. Reviewing existing information on protected areas using remote sensing surveys 2. Acquiring satellite imagery and aerial photos and commissioning new aerial surveys 3. Conducting ground surveys and compiling new maps <p>2 Identifying gaps and overlaps</p> | <p>Completed in all National Parks. Vegetation has been categorised into 9 classes</p> <p>The distribution of Vegetation Classes Map of Zambia produced.</p> <p>Maps indicating coverage of Vegetation in both protected and non protected areas have produced.</p> <p>Management Effectiveness Tracking Tool for PAs in Zambia developed.</p> |
| 2. To Modify the existing protected areas network to include representative areas of viable size of all major ecosystems | New areas for inclusion in the protected areas network identified and new protected areas gazetted | Assess the present status and trends of the country's biodiversity and re-orient the criteria for identifying representative areas to be gazetted as protected areas | Developing criteria for establishing new protected areas that clearly allows and defines levels of permissible use | Preparation of Criteria for identifying new protected areas for National Parks under the Reclassification and Effective Management of National Protected Areas System Project. |
| 3. Enhancing the effective participation of stakeholders in the management of the PA network. | Local and broad participation in the protection and management of the protected areas network in place | Involve all key stakeholders in the management and protection of the PAs through development of appropriate structures | <ol style="list-style-type: none"> 1. Reviewing existing models of participatory management systems. 2. Designing and implementing with communities, participatory management models/systems and the incentive schemes therein | <p>Public-Private-Partnership (PPP) Models developed and tested in two demonstration sites.</p> <p>Guidelines for Joint Forest Management (JFM) developed and piloted in 6 local forests.</p> |
| Goal 2: Conservation of the Genetic Diversity of Zambia's Crops and Livestock | | | | |

| <i>Objective</i> | <i>Outcome</i> | <i>Strategy</i> | <i>Activities</i> | <i>Progress</i> |
|---|--|--|---|--|
| 1. To Conserve the Genetic diversity of traditional crop varieties and their wild relatives | Genetic diversity of traditional crop varieties and their wild relatives conserved | 1. Assess the current status and distribution of traditional crop varieties and their wild relatives, identify threats affecting them and conserve them through <i>ex-situ</i> approaches to cover the widest possible genetic diversity existing in the country | <ol style="list-style-type: none"> 1. Conducting field surveys to determine the distribution and availability of traditional crop varieties and their wild relatives 2. Identifying threats to traditional crop varieties 3. Developing a data base on available crop genetic diversity and their wild relatives 4. Setting priorities and determining strategies for the conservation of crop genetic resources and their wild relatives | <p>Through the National Plant Genetic Resource Programme the country's traditional crop diversity and associated indigenous knowledge have been collected and conserved.</p> <p>Introduction of exotic crops identified as a treat to traditional crops.</p> <p>Data base established at the National Plant Genetic Resource Centre for short to medium-term storage of plant materials. The duplicate samples are deposited at the Southern Africa Development Community Regional Gene Bank (SRGB) which holds the base collection for the sub-region.</p> <p>Through the National Agriculture Policy strategies and priorities have been set to ensure conservation of crop genetic resources and there wild relatives</p> |
| | | 2. Improve the <i>ex-situ</i> conservation of existing collection through effective management and strengthening of existing facilities | <ol style="list-style-type: none"> 1. Reviewing and improving the monitoring system of seed samples maintained in the gene bank 2. Regenerating seed samples maintained in the gene bank 3. Establishing field gene bank and <i>in-vitro</i> facilities to conserve the genetic diversity of vegetative propagated crops 4. Establishing duplicate safety <i>ex-situ</i> collection outside the | <p>Monitoring viability and regeneration of gene plasma materials is ongoing</p> <p>Field gene bank holding Cassava and sweet potato genetic resources has been established and maintained by ZARI at Mount Makulu</p> <p>Genetic materials stored in Svalbard, Norway</p> <p>Gene bank established and operational at Mount Makulu.</p> |

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| | | | country | |
| | | | 5. Constructing and furnishing a gene bank building | |
| | | 3. Develop and implement <i>on-farm/in-situ</i> conservation measures to conserve the traditional crop genetic diversity and their wild relatives through the assessment and appropriate intervention in prevailing traditional and modern farming practices | <ol style="list-style-type: none"> 1. Conducting surveys of traditional farming systems and documenting local knowledge and practices and impacts on traditional crop varieties 2. Promoting the use of sustainable traditional and modern farming practices 3. Creating awareness among farmers on the value of agro-biodiversity | <p>Pilot sites for on-farm conservation established in Rufunsa and Chikankata</p> <p>Crop varieties of maize, sorghum and <i>Bambara</i> groundnuts restored through participatory approaches</p> <p>Awareness creation among farmers on the importance of biological diversity through on-farm field days and seed diversity fairs ongoing</p> |
| 2. To conserve the genetic diversity of traditional livestock breeds | The Conservation of genetic diversity of traditional livestock breeds | Assess the status of, and inventorise the traditional livestock genetic diversity and develop appropriate conservation measures | <ol style="list-style-type: none"> 1. Conducting an inventory and assessing the genetic diversity and conservation status of all livestock in the country 2. Creating database for livestock genetic resources 3. Designing and implementing strategies for the conservation of livestock genetic resources | <i>No data available</i> |
| Goal 3: Improve the legal and institutional framework and human resources to implement the strategies for conservation sustainable use and equitable sharing of benefits from biodiversity | | | | |
| <i>Objective</i> | <i>Outcome</i> | <i>Strategies</i> | <i>Activities</i> | <i>Progress</i> |

| | | | | |
|--|---|--|---|--|
| <p>1. To Strengthen and develop legal and institutional frameworks for the management of diversity in Zambia's PAs</p> | <p>Establishment of enabling institutional and legal framework for sustainable biodiversity management</p> | <p>Reviewing the structures and operations of all major institutions involved in the management of biodiversity</p> | <p>1. Assessing existing frameworks and developing appropriate legal and institutional framework and human resource capacity</p> | <p>The National Policy on Environment has developed and adopted by government in 2007 Wildlife and Forestry policy and legislation review commenced</p> |
| <p>2. To develop Coordination mechanism among institutions responsible for biodiversity management</p> | <p>Establishment and implementation of a coordination mechanism among institutions responsible for diversity management</p> | <p>Effective co-ordination of biodiversity activities and development of effective institutions at all levels</p> | <p>1. Strengthen the capacity of MENR to co-ordinate biodiversity management 2. Establishing an inter-institutional consultative forum</p> | <p>National Capacity Self Assessment (NCSA) conducted to assess the MTENR's capacity to implement the three (3) Rio Conventions conducted NCSA Action Plan developed Natural Resources Consultative Forum established</p> |
| <p>3. To improve biodiversity knowledge in Zambia</p> | <p>Increased knowledge among the stakeholders</p> | <p>Expand the understanding of the biodiversity and its sustainable use through research, training and information dissemination</p> | <p>1. Developing guidelines for biodiversity assessment 2. Conducting systematic assessment of biodiversity in all ecosystems with particular emphasis to areas outside the protected areas 3. Documenting scientific and indigenous knowledge about biodiversity 4. Training taxonomists in various key fields of biological resources 5. Providing positions and facilities for taxonomical work in various key fields of</p> | <p>Not done Research conducted by The University of Zambia, School of Natural Sciences. Not done Higher learning institutions conduct training (University of Zambia, The Copperbelt University) Herbaria exists at the University of Zambia, ZARI</p> |

| | | | | |
|---|---|---|--|---|
| | | | biological resources 6. Disseminating knowledge about biodiversity | and Forestry Research Awareness activities carried out |
| Goal 4: Sustainable Use and Management of Biological Resources | | | | |
| <i>Objectives</i> | <i>Outcome</i> | <i>Strategies</i> | <i>Activities</i> | <i>Progress</i> |
| 1. To develop and implement local management systems that promote sustainable use of biological resources | The establishment of management systems that promote sustainable use of biological resources and their implementation | 1. Creation/development of new and improvement of existing local management systems | 1. Revising, creating and strengthening local management committees | Local management structures reviewed |
| | | 2. Establishment of CBNRM programmes that will include all aspects of biological resources, drawing on experiences gained from ADMADE and similar management systems for wildlife which involve local communities | 1. Reviewing existing CBNRM programmes 2. Establishing new CBNRM programmes and strengthening existing ones 3. Conduct exchange visits and open days | Review process ongoing Ongoing through collaboration with cooperating partners. Exchange visits undertaken to neighbouring countries in the SADC region |
| | | 3. Designing of incentive schemes which will apply to all aspects of biological resources and stakeholders | 1. Conducting inter-sectoral, participatory and consensus building workshop | Workshops conducted in the wildlife and forestry sectors |
| 2. To establish the sustainable maximum yield of biological | An established and fully functional monitoring system established | Gathering of information/data for determining the maximum sustainable yield and establishing a monitoring | 1. Carrying out literature review and desktop research | Integrated Land Use Assessment undertaken. Management Effectiveness Tracking Tool for |

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| resources and design and implement a system for monitoring their utilisation and management | | system for biological resources | <ol style="list-style-type: none"> 2. Carrying out field studies 3. Conducting consultation with stakeholders 4. Documentation and dissemination of agreed standards and guidelines | Protected Areas developed. |
| Goal 5: Develop an appropriate legal and Institutional Framework and the needed human resources to minimise the risks of the use of Genetic Modified Organisms (GMOs) | | | | |
| <i>Objective</i> | <i>Outcome</i> | <i>Strategy</i> | <i>Activities</i> | <i>Progress</i> |
| 1. To establish an appropriate legal policy framework for Bio-safety | Appropriate institutional framework for bio-safety established | Using experiences gained from other countries | <ol style="list-style-type: none"> 1. Reviewing existing structures, mandates and linkages. | <p>Bio-safety policy developed and adopted in 2003</p> <p>Bio-safety Act which provides for the establishment of a National Bio-safety Authority enacted in 2007.</p> <p>National Bio-safety Authority established and functional</p> |
| 2. To develop adequate human resources for bio-safety | Adequate human resources for bio-safety are developed and put in place | Training human resources from relevant Institutions in risk assessment and management, learning and adapting from experiences of other countries and raising awareness in bio-safety among stakeholders | <ol style="list-style-type: none"> 1. Training of human resources in risk assessment and management 2. Learning and adapting experiences of other countries 3. Carrying out sensitisation and awareness campaigns | <p>Zambia affiliated to the Southern African Regional Bio-safety Programme, the Africa Bio and the Southern and East African Consultation on Biotechnology and Bio-safety where the country has benefited and drawn lessons learnt to implement issues of bio-safety.</p> <p>Sensitization and awareness on bio-safety related issues is on-going</p> |
| Goal 6: Ensure the equitable sharing of benefits from the use of Zambia's biological resources | | | | |
| <i>Objective</i> | <i>Outcome</i> | <i>Strategies</i> | <i>Activities</i> | <i>Progress</i> |
| 1. To develop and adopt a legal and institutional | Equitable sharing of benefits | <ol style="list-style-type: none"> 1. Revise legislations to provide for equitable sharing of benefits. Study | <ol style="list-style-type: none"> 1. Reviewing and amending existing legislative provisions for equitable sharing of benefits | A draft Biodiversity Bill developed. |

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|--|--|---|--|--|
| <p>framework which will ensure that benefits are shared equitably</p> | | <p>existing legal frameworks in other countries providing for equitable sharing of benefits and where applicable adapt to the local conditions</p> | <p>from natural resources such as fisheries, forestry and wildlife</p> <p>2 Improving capacity in government to effectively negotiate for equitable sharing of benefits at international level</p> | |
| | | <p>2. Develop a legal and institutional framework by strengthening the enforcement of the necessary provisions relevant to ensuring equitable benefit sharing</p> | <p>1. Developing capacities (understanding and mechanisms) for implementing institutions to enforce new and existing legislation on equitable sharing of benefits from natural resources</p> | |
| <p>2. To create and strengthen community-based natural resources management institutions</p> | <p>Effective management and utilisation of natural resources by traditional establishments and local communities</p> | <p>Create and strengthen Natural Resources Management Institutions through experiences gained from existing Community Based Resource Management Schemes</p> | | |

2.3 Domestic and International Funding To Priority Activities of the NBSAP

During the reporting period the management of biological resources continued receiving financial support from both local and international sources. The Government provided both financial and technical resources towards implementation of various programs and plans. The major sources of international funding were the Global Environmental Facility (GEF), The World Bank, Swedish International Development Agency (SIDA), the Norwegian Government and the Norwegian Agency for Development (NORAD), the Finnish Government, Food and Agriculture Organisation of the United Nations (FAO), WWF, African Development Bank (AfDB), and the United Nations Development Programme (UNDP). Table 5 below indicates some of the programmes and projects implemented during the reporting period, including funding sources and levels.

Table 5: Biodiversity Conservation and Management Related Projects

| Project | Project Implemented within Framework of Priority Areas | Time Frame | Partners | Budget |
|---|--|-------------------|--|---|
| Reclassification and Effective Management of National Protected Areas System | <ul style="list-style-type: none"> • Conservation of ecosystems and protected areas • Sustainable use and management of biological resources | 2006-2011 | Government, UNDP, GEF | US\$8,000,000 |
| Global Environment Facility's Small Grants Programme | <ul style="list-style-type: none"> • Sustainable use and management of biological resources | 2008–2010 | GRZ, GEF-UNDP, WB, Local NGOs, CBOs | US\$380,000 |
| Environment and Natural Resources Management and Mainstreaming Programme | <ul style="list-style-type: none"> • Provision of appropriate legal and institutional framework and human resources to implement biodiversity programmes | 2008-2012 | Denmark, Norway, Finnish Government, UNDP, GRZ | US\$38,302,850 |
| Lake Tanganyika Integrated Management Project | <ul style="list-style-type: none"> • Sustainable use and conservation of biological resources | 2005-2010 | AfDB, GEF/UNDP, GRZ, | US\$2,400,000 (GEF/UNDP Grant) US\$4,800,000 (AfDB Loan) |
| Youth Environment and Education Project | <ul style="list-style-type: none"> • Provision of appropriate legal and institutional framework and human resources to implement biodiversity programme | | GRZ, GEF | US\$130,000 |
| Integrated Land Use Assessment | <ul style="list-style-type: none"> • Sustainable use and conservation of biological resources | 2005-2008 | GRZ, Finnish Government, FAO | US\$ 850,000 |
| Maximizing socio-economic benefits and mitigating environmental effects associated with agricultural development programme. (Nacala Development Corridor) | <ul style="list-style-type: none"> • Sustainable use and conservation of biological resources | 2007 | WWF-USA, WWF-Zambia | US\$70,000 |
| Achieving the Millennium Development Goals in African Dry Forests: from local action to national forest policy reforms | <ul style="list-style-type: none"> • Sustainable use and conservation of biological resources • Provision of appropriate legal and institutional framework and human resources to implement biodiversity programme | 2006 - 2009 | CIFOR, SIDA, GRZ | US\$512,000.00 |

| | | | | |
|---|--|-------------|-----------------------------|---------------|
| Removing Barriers to Invasive Plant Management in Africa Project | <ul style="list-style-type: none"> • Conservation of ecosystems and protected areas | 2007 - 2010 | ECZ, ZAWA | |
| Zambia Rivers and Wetlands Programme (Lukanga Swamps and Kafue Flats) | | | WWF-Netherlands, WWF-Zambia | Euro9,000,000 |

2.4 Challenges, Obstacles Encountered and Lessons

The country faced a number of challenges in the implementation of the NBSAP and these include:

- i) Management of biodiversity in the country is heavily dependent on donor funding, with limited resources from central government posing a challenge to sustainability programmes;
- ii) Institutions mandated to manage biodiversity in the country are weak with inadequate human resources and poor cross-sectoral coordination;
- iii) Inadequate awareness at all levels affecting decision making;
- iv) Resource users rarely own the resources which affects their sustainable utilization. Furthermore, insufficient incentives for community based management adversely affect conservation and management of biological resources resulting in land use conflicts especially in some protected areas;
- v) There are no detailed inventories to provide information for the development of forest management plans. Consequently, issuing of licences for forest resource use is not based on knowledge of the available resources. This makes it difficult to monitor and regulate exploitation;
- vi) Increasing deforestation, wildfires, illegal hunting and fishing due to population growth leading to an increasing demand for arable land, unemployment and weak enforcement of relevant policy and legislation;
- vii) Encroachment of protected areas resulting into destruction and/or degradation of habitats. The major causes of encroachment include: shifting cultivation, low agricultural productivity, food insecurity, poverty and limited alternative income sources;
- viii) The slow pace of policy and legislation review to embrace the principle of public-private-partnership (PPP) has affected effective collaboration in the management of biological resources.

2.5 Analysis of the Effectiveness of NBSAP

The NBSAP was developed to address conservation of biological resources in the country in order to contribute to poverty reduction, economic growth and creation of employment opportunities to the local population. In addition, it was also meant to ensure the continuity of life-form supporting processes such as regulation of the water and nutrient cycles, control of soil erosion and land degradation and regulation of climatic changes.

Annex III indicates progress towards achievement of the strategic goals, objectives and planned activities contained in the NBSAP during the reporting period.

CHAPTER III

SECTORAL AND CROSS-SECTORAL INTEGRATION OF BIODIVERSITY

Zambia recognises that the prudent use of biological resources is critical to sustainable development. Forests, fish, wildlife and other biological resources could provide the basis for sustainable development. However, sustainability of resources depends on enabling biodiversity conservation measures, policies and laws that provide for the participation of various stakeholders particularly local communities and the private sector. In this regard, the Government of Zambia continued to put in place policies and programmes to ensure that biological resources contribute to poverty reduction and economic growth.

This chapter provides highlights on the sectoral and cross-sectoral policies, plans and programmes into which biodiversity conservation has been mainstreamed.

3.1 SECTORAL POLICIES

In an effort to address the threats to biodiversity, Zambia has appropriate sectoral policies that provide for effective management and utilisation of biological resources. Some of the policies include:

3.1.1 Policy for National Parks and Wildlife

The Policy for National Parks and Wildlife in Zambia was adopted in 1998. The mission of the Policy is *to encourage the promotion, appreciation and sustainable use of wildlife resources by facilitating the local communities in the management of the wildlife estate*. It acknowledges that local people and other landholders are the best custodians of the wildlife estate and other renewable resources on their land. The Zambia Wildlife Authority (ZAWA), a corporate body established under the Zambia Wildlife Act of 1998, is responsible for the overall management of wildlife in Zambia on behalf of government.

The Zambia wildlife policy promotes the conservation of wildlife in National Parks, Game Management Areas and open areas. The Management of all National Parks is through approved general management plans developed in accordance with internationally accepted norms. The plans are prepared through an interactive consultative process with various stakeholders. In the GMAs and open areas the management of wildlife is done in collaboration with Community Resource Board (CRBs). The CRBs have joint responsibility with ZAWA for managing GMAs. As an incentive to any CRB an agreed portion of revenues and benefits accruing from sustainable utilisation of wildlife resources in the GMA are ploughed back into the resource generating communities.

The policy also recognises the management of landscape and plants, threatened or endangered species in protected areas. Water resources management in National parks are considered an integral component of park management.

3.1.2 National Forestry Policy

The National Forestry Policy was formulated in 1998 with a mission to ensure sustainable flow of wood and non-wood products and services while at the same time ensuring protection and maintenance of biodiversity for the benefit of the present and future generations through the active participation of all stakeholders.

One of the forestry policy objectives specific to biodiversity management is to *conserve forest ecosystems and biodiversity through sustainable management for the benefits of women, men and children of both the present and future generations.*

The Forestry Policy is undergoing review to strengthen biodiversity conservation and take care of emerging issues such as climate change.

3.1.3 Fisheries Policy

The Fisheries Policy, formulated in 2003 aims at improving the management of fisheries in the country. The policy promotes a participatory fisheries management approach which enhances conservation of fish resources. In order to achieve sustainable management of fish resources, one of the strategies is to engage the fishing communities in the management of fish resources including fishing area boundaries and the joint development of management plans.

3.1.4 National Agricultural Policy

The National Agricultural Policy was formulated in 2004 and aims at facilitating and supporting the development of a sustainable and competitive agricultural sector that assures food security at national and household level and maximises the sector's contribution to GDP. Two strategies are of importance to biological resources management. These are: maintaining *agro-biodiversity, aquatic eco-system, sustainable utilisation of biological resources, and, promotion of sustainable and environmentally sound agricultural practices.*

3.1.5 National Energy Policy

The National Energy Policy of 2008 promotes the development of alternative sources of energy (solar, wind and hydro) as a way of reducing demand for wood fuel, subsequently enhancing conservation of forest biodiversity. The policy recognises that a significant population will continue to use biomass energy and for this reason it seeks to put in place measures to address sustainable utilisation of the biomass energy. This policy has significant relationship with biodiversity especially the forest resources as it has taken care of the need to address the wood fuel issues that cause forest depletion.

3.1.6 National Lands Policy

The draft Lands Policy (2006) aims at having an efficient and effective land administration system that promotes security of tenure, equitable access and control of land for the sustainable socio-economic development of the people of Zambia. In pursuing these objectives the draft policy recognises the challenges faced in the management of land and biological resources, and seeks to promote good land use practices through re-aligning all socio-economic activities involving land use to conform to prescribed environmental and natural resource conservation principles and guidelines.

3.1.7 Mines and Minerals Development Policy

The Mines and Minerals Development Policy (draft) seeks to promote transfer of ownership and control of mining industry, address past policy failures and facilitate the integration of the mining sector in the broader economy and to improve health, safety and environmental standards.

The draft policy sets 15 objectives, one of which relate to environmental management and states as follows: *To achieve a socially acceptable balance between mining and the physical and human environment and to ensure that internationally accepted standards of health, mining safety and environmental protection are observed by all participants in the mining sector.* The policy seeks to achieve this through the promotion of an orderly and environmentally friendly development of the mining sector, and proposes the following measures:

- i) Introducing an appropriate regulatory regime for managing environmental responsibilities in the gemstone and small-scale mining sub-sector;
- ii) Considering inclusion of post-mining use of land obligations in the process of granting mining licences;
- iii) Operationalise the Environmental Protection Fund;

3.2 Sector Programmes

The conservation of biodiversity components in the natural habitat is guided by various sector policies, legislation and action plans. Major action plans/programmes with a bearing on biodiversity conservation include:

3.2.1 Zambia Forestry Action Programme (ZFAP)

Forests in Zambia play a vital role in people's livelihoods supporting about 85% of the population. They are a major source of traditional medicines, fuel wood, food and raw materials for various uses. Forests are important in maintaining the carbon and hydrological cycles, protection of watersheds and soil conservation. Forest resources have been under pressure from human induced activities such as deforestation.

In an effort to reduce pressure on forest resources, the Zambian Government developed a 20 year programme, the Zambia Forestry Action Programme (ZFAP, 2000 - 2020). The programme is aimed at promoting sustainable management and utilisation of forest resources. However, the ZFAP implementation has been hampered by a number of challenges such as insufficient funds and inadequacy of staff.

3.2.2 Provincial Forestry Action Programme (PFAP)

The Provincial Forestry Action Programme was implemented from August 1995 and expected to wind up December 2009. The programme aimed at improving living conditions of communities through enhanced environmental protection in the pilot areas of three provinces (Copperbelt, Luapula and Southern). In each of the project working areas community structures were established and guidelines for implementing Joint Forest Management (JFM) concepts that include benefit sharing were developed.

3.2.3 Agricultural Support Programme (ASP)

The Agricultural Support Programme was a private sector driven initiative which aimed at improving livelihoods of small scale farmers by increasing food security and income through the sale of agricultural products.

The programme, which wound up in 2008, recognised and mainstreamed environmental concerns in all activities.

3.2.4 Food Security Pack (FSP)

The FSP is a social safety net that started in 2000 by Government aimed at empowering vulnerable but viable farmers who had lost productive assets due to recurrent adverse weather conditions and the negative impact of the Structural Adjustment Reforms that reduced the accessibility by small farmers to yield enhancing inputs and services. The FSP focused on improving household food security of vulnerable households by providing them with the means of economic growth and poverty reduction. The main objective was to empower the targeted households to be self-sustaining through improved productivity and household food security and thereby contribute to poverty reduction. The government provided inputs (seed and fertilizer) to poor households (FD, 2008). Over 200,000 small scale farmers benefited from the programme. The FSP promoted increased productivity per unit area, thereby reducing total land opened up for agricultural activities and promoting biodiversity conservation.

3.2.5 Environment and Natural Resources Management and Mainstreaming Programme (ENRMMP)

The Government in 2008 initiated the Environmental and Natural Resources Management Mainstreaming Programme (ENRMMP) to improve coordination and implementation capacity in the environment and natural resources sector. The Programme is based on the principles, priorities and objectives of Zambia's national development programmes, strategies and plans. It provides a platform for discussion between the Government and Cooperating Partners (CPs) on matters of environment and natural resources management in the country. The Programme, through one of its components, the Interim Environmental Fund, intends to address among other things the management of critical ecosystems and biodiversity hotspots.

3.3 Cross-Sectoral Policies and Programmes

3.3.1 Cross-Sectoral Policies

The development of multi-sectoral policies and programmes recognised and made provisions that reflect the Government's commitment to the conservation and sustainable utilisation of biological resources. National policies that reflect and attempt to mainstream biodiversity issues include:

3.3.1.1 The National Policy on Environment

The National Policy on Environment (NPE) of 2007 marks a milestone in the management of the environment and natural resources in a harmonised manner. The Policy provides an umbrella framework to avoid conflict of interest, harmonise sectoral strategies and rationalise legislation regarding the use and management of the environment in order to attain an integrated approach to development in the country.

The Policy's overall objective is to support the Government's development priority to eradicate poverty and improve the quality of the life of the people of Zambia. The NPE provides for the management and sustainable utilisation of biodiversity by preservation of the nation's natural heritage for the present and future generations.

One of the guiding principles of the NPE is to ensure wise and sustainable use of biological diversity consistent with maintaining the integrity of ecosystems and ecological processes. Underlying the entire policy is the Government's commitment to reduce poverty and achieve sustainable development for the nation as a whole on the basis of "development without destruction."

3.3.1.2 Decentralisation Policy

The Decentralisation Policy of 2002 calls for devolution of administrative and political authority to the district level. The vision of the policy is to achieve a fully decentralized and democratically elected system of governance characterized by open, predictable and transparent policy making and implementation processes, effective community participation in decision-making, development and administration of their local affairs while maintaining sufficient linkages between the centre and the periphery.

The implication of the Policy on biological resources management is that the local community will play a more significant role in planning, implementation and decision making on matters of biological resource management and utilisation.

3.3.2 Cross Sectoral Programmes

Zambia developed various cross sectoral policies and programmes with a bearing on biodiversity conservation. These include:

3.3.2.1 Fifth National Development Plan

The Government prepared the Fifth National Development Plan (FNDP), running from 2006 to 2010 whose theme is “*wealth and job creation through citizenry participation and technology advancement.*” The FNDP is considered as a guide to the country’s development efforts over the medium and long term period and at the same time an important vehicle towards the realization of Millennium Development Goals (MDGs) and the Vision 2030. The FNDP has strategies which support management of biological resources such as the expansion of the country’s protected areas system.

3.3.2.3 National Action Programme for Implementation of the United Nations Convention to Combat Desertification (UNCCD)

In 2002 the Government developed the National Action Programme (NAP) for combating desertification and mitigating serious effects of drought in the context of the UNCCD. The purpose of the NAP was to identify the factors contributing to desertification and put in place practical measures necessary to combat desertification and mitigate the effects of drought. The NAP aims at contributing to sustainable environmental management through reduction/control of land degradation thereby contributing to poverty reduction, food self sufficiency and food security and ultimately contributing to economic growth. NAP has seven immediate objectives and eleven priority programmes. The programmes related to biological diversity are:

- i). Forest, ecosystems and species conservation;
- ii). Water catchments and energy conservation;
- iii). Livelihood improvement;
- iv). Food Self Sufficiency and Food Security; and
- v). Legal and Policy Reviews.

The NAP programmes are implemented in five (5) provinces within Agro-ecological Regions I and II that experience severe land degradation and drought namely; Central, Eastern, Lusaka, Southern and Western. In an effort to enhance implementation of the NAP, the Government prepared a Country Partnership Framework Paper (CPFP) in 2004.

3.3.2.4 Wetlands Policy

Zambia has extensive and diverse wetlands of considerable local and international importance covering approximately 14% of the country’s surface area. These wetlands are valuable socio-economic assets from which a variety of resources are harvested or exploited. Some wildlife species are endemic to specific wetlands, for instance the Black Lechwe (*Kobus leche, smithemani*) with regard to the Bangweulu Plains. During the reporting period, the country initiated the process of developing a National Wetlands Policy to guide the management and sustainable utilisation of wetland resources.

3.3.2.5 National Adaptation Programme of Action (NAPA)

Zambia is Party to the United Nations Framework Convention on Climate Change (UNFCCC) which is closely linked to the CBD. As part of its obligations under the UNFCCC Zambia developed and adopted a National Adaptation Programme of Action (NAPA) in 2007. The NAPA identified priority areas and proposed activities to address the country’s urgent and immediate needs for adapting to the adverse impacts of climate change. The following identified areas are relevant to biodiversity conservation:

- i) agriculture and food security;
- ii) water and energy;
- iii) human health; and

iv) natural resources (wildlife and forestry).

Furthermore, the Government commenced the process of developing a National Climate Change Response Strategy to provide a comprehensive framework for addressing climate change including adaptation, mitigation, finance, technology, capacity building and awareness and advocacy. In addition a Vulnerability and Adaptation Assessment (VAA) was conducted and preliminary results indicated that there was poor integration of food security activities into environmental management programmes. Furthermore, the community's interaction with the environment, biodiversity conservation and energy use are so intertwined that it is more cost effective to address them concurrently.

CHAPTER IV

CONCLUSIONS ON PROGRESS TOWARDS THE 2010 TARGETS AND IMPLEMENTATION OF THE STRATEGIC PLAN

This Chapter has three sections. The *first* section provides a summary of the findings and highlights the progress towards the 2010 targets. The *second* section highlights progress towards attaining the goals and objectives of the Strategic Plan of the Convention and analyses the obstacles encountered. The *third* section highlights the impacts, lessons learnt, capacity building needs at national level, and provides conclusions on the implementation of the Convention. It also recommends actions that need to be taken at regional and global levels to further enhance implementation of the Convention.

4.1 PROGRESS TOWARDS THE 2010 TARGETS

During the period under review, Zambia made some progress towards the 2010 biodiversity targets. Details of the country's progress towards the 2010 biodiversity targets are provided in Annex III.

4.1.1 Incorporation of Targets into Relevant Sectoral and Cross-Sectoral Strategies, Plans and Programmes

The Government of Zambia has continued making efforts to put in place national programmes and policies that ensure that biological resources contribute to poverty reduction and economic growth. Further, efforts were made to integrate measures to address threats that affect biodiversity into national programmes, policies and strategies such as forestry, wildlife, fisheries and agriculture. The NPE, ZFAP, FNDP and NAPA attempt to elaborate measures to address biodiversity conservation.

4.1.2 Obstacles in achieving the 2010 biodiversity targets and implementation of the strategic plan

The country met a number of challenges in implementing the NBSAP, some of which include:-

- i). Inadequate specialised skills in policy analysis and harmonisation of legal instruments;
- ii). Inadequate skills of local communities in sustainable management and utilisation of biological resources;
- iii). Limited resources to support the management of biological resources;
- iv). Information gaps at national and local levels;
- v). Lack of a sense of ownership among resource users affecting sustainable utilisation;
- vi). Outdated management plans and information;
- vii). Deforestation, wildfires, and illegal exploitation of biological resources; Encroachment on protected areas; and
- viii). Deficiencies in the legal, regulatory, and institutional framework.

4.2 Progress towards the Goals and Objectives of the Strategic Plan of the Convention

During the period under review, significant strides were made towards the attainment of some of the set goals. The country participated at COPs and other meetings of the Convention both at international and regional level. Furthermore, the country continued to domesticate multilateral environmental agreements including the following:-

- i) Developed bio-safety policy and legislation which established a National Bio-safety Authority;
- ii) Put in place a Designated National Authority (DNA) for the Clean Development Mechanism (CDM) under the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC); and
- iii) Developed the National Adaptation Programme of Action (NAPA) under the UNFCCC;

In addition, the country developed and reviewed policies, legislation, programmes and plans that integrated existing and emerging biodiversity concerns at national, regional and global level as outlined below:

- i) Development of the National Policy on Environment;
- ii) Review of sector policies such as the National Agricultural Policy, National Forestry Policy, National Wildlife Policy, Fisheries Policy, Lands Policy, National Energy Policy and the Mines and Minerals Development Policy;
- iii) Development of sector plans such as the Rural Electrification Master Plan and the National Water Resources Master Plan; and
- iv) Development of intersectoral programmes such as the Fifth National Development Plan (FNDP), the Decentralisation Implementation Plan and the Public Sector Reform Programme (PSRP).

Little progress was made towards achievement of goal number 2. Efforts were made towards attainment of objective 2.1 through higher learning institutions such as the University of Zambia and the Copperbelt University that continued to provide training in biological sciences. New programmes in areas such as wildlife management and fisheries were introduced to enhance the managerial capacities in biodiversity conservation. The country also continued to facilitate and support training in relevant specialised fields abroad.

The information regarding progress towards implementation of the Strategic Plan of the Convention is the same as that provided for progress in the implementation of the NBSAP as highlighted in Table 4 of Chapter II.

4.3 Conclusions and Recommendations

Zambia's biological resources will remain essential for sustainable social and economic development especially for the rural communities which are largely dependent on these resources for their livelihoods. However, these resources continue to be under pressure due to over exploitation and destruction from fires, pollution and other human activities.

In an effort to promote sustainable management and conservation of biological resources, Zambia has been implementing the NBSAP that was adopted in 1999. This report notes that some progress has been made towards the set goals and objectives of the NBSAP. Relevant policies and legislation were developed and reviewed and appropriate institutional frameworks

put in place to enhance implementation of the Convention. The National Policy on Environment was adopted in 2007, the Bio-safety Act enacted in 2007 and a National Bio-safety Authority established.

4.3.1 Lessons Learnt in the Implementation of the Convention

- i). **Sector Approach:** Sectoral approach to implementation of activities had negative effects. For instance, regarding protected areas, focus was predominantly on wildlife at the expense of other sectors such as forestry and fisheries;
- ii). **Benefit Sharing:** For any benefit sharing arrangement to be effective, all the parties involved should be empowered to participate in decision making;
- iii). **Capacity to implement the Convention:** Implementation of the Convention requires specialised skills at various levels including local communities;
- v). **Ownership:** Resource users rarely own the resources. Sustainable management is hampered by lack of a sense of ownership of resources;
- vi) **Financial Support:** Implementation of the Convention has largely depended on external funding. This threatens the sustainability of programmes when external funding ceases.

4.3.2 Future Capacity Building Needs

In order to enhance the implementation of the Convention future capacity building may focus on the following areas:

- i). Integrated management approaches for conservation and management of biological resources;
- ii). Cross-sectoral coordination, planning and policy formulation and implementation;
- iii). Specialised training, including that of local communities, in biodiversity related fields; and
- iv). Monitoring of vulnerable, rare and endangered species.


4.3.3 Recommendations

The following recommendations are made to further enhance implementation of the Convention:

- i). Review the NBSAP in line with current national policies, strategies and programmes (e.g. ENRMMP, SNDP, NAPA);
- ii). Develop monitoring tools and methodologies for accurate data capture and reporting;
- iii). Promote an integrated ecosystem management approach;
- iv). Develop a comprehensive national protected areas system;

ANNEXES

Annex I: Information concerning reporting party and preparation of national report**A. Reporting Party**

| | |
|--|---|
| Contracting Party | ZAMBIA |
| NATIONAL FOCAL POINT | |
| Full name of the institution | Ministry of Tourism, Environment and Natural Resources |
| Name and title of contact officer | Mr. Ignatius Makumba, Chief Natural Resources Management Officer |
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| CONTACT OFFICER FOR NATIONAL REPORT (IF DIFFERENT FROM ABOVE) | |
| Full name of the institution | Ministry of Tourism, Environment and Natural Resources |
| Name and title of contact officer | Lillian E. L. Kapulu (Mrs.), Permanent Secretary |
| Mailing address | P.O. Box 30575, Lusaka 10101, Zambia |
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| Fax | +260-211-223930 |
| E-mail | psmtenr@mtenr.gov.zm |
| SUBMISSION | |
| Signature of officer responsible for submitting national report |  |
| Date of submission | 9th September 2010 |

B. *Process of preparation of national report*

The preparation of the report followed a participatory and consultative approach. The Ministry closely collaborated with other stakeholders through a Consultant who worked with a selected core team. Emphasis was placed on stakeholder consultation and involvement in the process of developing the national report to harness the knowledge and expertise in the sector. The methodology to prepare the report involved:

- a) **Literature Review:** This involved reviewing all relevant documents related to the implementation of the Convention and included the Fifth National Development Plan (FNDP), National Biodiversity Strategy and Action Plan (NBSAP), National Policy on Environment (NPE), Millennium Ecosystem Assessment (MA) Report, sector policy documents, case studies and project progress reports.
- b) **Field Work:** The aim of this process was to get the information from the stakeholders and determine the situation in the field with regard to the implementation of the CBD. The field work process included:
 - i) **Visitation to Project Sites:** The areas visited were Lundazi and Chipata in Eastern Province, Livingstone in Southern Province and Mpika in Northern Province.
 - ii) **Consultative Meetings/Workshops:** Consultative meetings with informants were held with local communities, government ministries, the private sector and higher learning and research institutions. A national stakeholder's workshop was held to validate the findings of the report.

Annex II: Further Sources of Information

- CBD (2009), Guidelines for Preparation of the 4th National Report on the implementation of the Convention of Biological Diversity in Zambia, UNCBD.
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- MACO (2004), Draft Fisheries Policy, Ministry of Agriculture and Cooperatives, GRZ, Lusaka.
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MTENR (2008), Reclassification and Effective Management of the National Protected Areas System Project, GRZ, Lusaka.

MEWD (2006), Draft National Energy Policy, Ministry of Energy and Water Development, GRZ, Lusaka.

MEWD (2006), Draft National Water Policy, Ministry of Energy and Water Development, GRZ, Lusaka.

ZAWA (2007) Management Effectiveness Assessment of Protected Areas managed by ZAWA, Chilanga, Lusaka.

Annex III: Provisional framework of goals, targets and indicators to assess progress towards the 2010 Biodiversity Target

| Goals and targets | Relevant indicators |
|--|--|
| Protect the components of biodiversity | |
| <i>Goal 1. Promote the conservation of the biological diversity of ecosystems, habitats and biomes</i> | |
| <p>Target 1.1: At least 10% of each of the world's ecological regions effectively conserved.</p> | <ul style="list-style-type: none"> • The country has four biomes divisions namely forest, wood land, thickets and grasslands. The forest and wood land cover 68.07% of the total land area, fresh water 14%, and grassland 17.14%. • The country continued to manage and maintain fourteen ecosystems namely dry evergreen forests (59%), deciduous (25%), thickets (7%) and Riparian (3%). • An estimated total of 7,774 species of organisms occur in Zambia. Micro-organisms constitute 8%, plants 47% and fauna 45%. There are a total of 316 endemic, 174 rare and 31 species are considered endangered or vulnerable. • 1,808 species of invertebrates, 224 mammals, 409 of fish, 67 amphibians, 150 reptiles and 733 birds have been identified. • The floristic diversity has been estimated at 4,600 species of which 211 are endemic. |
| <p>Target 1.2: Areas of particular importance to biodiversity protected</p> | <ul style="list-style-type: none"> • There are a total of 19 National Parks covering 8% of the total land area mainly to manage wildlife and also 34 Game Management Areas. The country is in the process of establishing a twentieth National Park • There are a total of 480 forest reserves covering an area of 7.2 million hectares. • The Botanic Reserves are estimated at 59 and about 50% of them have been encroached or depleted. • 11 major fishery areas in form of lakes, dams and rivers were protected. The major fishery areas in Zambia are Lakes Bangweulu, Tanganyika and Mweru-wa-Ntipa, Lukanga Swamps, Bangweulu Wetlands, Itezhi-tehzi, Lusiwashi and Kariba dams, Kafue, Zambezi and Luangwa Rivers. |
| <i>Goal 2. Promote the conservation of species diversity</i> | |
| <p>Target 2.1: Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups.</p> | <p><i>No data available.</i></p> |
| <p>Target 2.2: Status of threatened species improved.</p> | <p><i>No data available</i></p> |
| <i>Goal 3. Promote the conservation of genetic diversity</i> | |

| Goals and targets | Relevant indicators |
|--|--|
| Target 3.1: Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained. | <ul style="list-style-type: none"> • Restocking of domesticated animals carried out in some parts of the country. • Zambia Agricultural Research Institute continued to maintain genetic crop materials for domesticated crops |
| Promote sustainable use | |
| <i>Goal 4. Promote sustainable use and consumption.</i> | |
| Target 4.1: Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity. | <ul style="list-style-type: none"> • Forest resource assessment carried out to improve management of protected areas. • Co-management initiatives introduced for fishery and forest resources. • Reclassification and effective management of protected areas piloted |
| Target 4.2. Unsustainable consumption, of biological resources, or that impact upon biodiversity, reduced. | <i>No data available</i> |
| Target 4.3: No species of wild flora or fauna endangered by international trade. | <ul style="list-style-type: none"> • Government continued to implement the provisions of CITES. This contributed to the reduction in poaching of elephants and increase in their population by about 20%. |
| Address threats to biodiversity | |
| <i>Goal 5. Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced.</i> | |
| Target 5.1. Rate of loss and degradation of natural habitats decreased. | <ul style="list-style-type: none"> • |
| <i>Goal 6. Control threats from invasive alien species</i> | |
| Target 6.1. Pathways for major potential alien invasive species controlled. | <ul style="list-style-type: none"> • 800 hectares of <i>Mimosa pigra</i> representing 26% of the infestation in Lochinvar National Park and 11 hectares of <i>Lantana camara</i> representing about 2% of the infestation at the Victoria Falls pilot sites were cleared |
| Target 6. 2. Management plans in place for major alien species that threaten ecosystems, habitats or species. | <ul style="list-style-type: none"> • National Policy on Environment in place with provisions to deal with alien species • Draft National Invasive Species Strategic Action Plan prepared • Draft Cost-Recovery Mechanisms for Invasive Alien Species activities from Public and Private Sector prepared |
| <i>Goal 7. Address challenges to biodiversity from climate change, and pollution</i> | |

| Goals and targets | Relevant indicators |
|---|---|
| Target 7.1. Maintain and enhance resilience of the components of biodiversity to adapt to climate change. | <ul style="list-style-type: none"> • Biodiversity issues and actions harmonized in the NAPA. |
| Target 7.2. Reduce pollution and its impacts on biodiversity. | <ul style="list-style-type: none"> • Inspection pollution and compliance monitoring in effect; generally compliance levels are still low and capacities for measuring pollutants are low. However, to address these the Environmental Protection and Pollution Control Act of 1990 is under review • The ECZ has enforced EIAs for all development activities and biodiversity issues and mitigation measures are being enhanced by developers through environment management plans. |
| Maintain goods and services from biodiversity to support human well-being | |
| <i>Goal 8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods</i> | |
| Target 8.1. Capacity of ecosystems to deliver goods and services maintained. | <ul style="list-style-type: none"> • Government has put in place enabling policies, legislation and programmes (such as the Reclassification and Effective Management of National Protected Areas Systems Project; Lake Tanganyika Integrated Management Project) for sustainable management of biological resources. |
| Target 8.2. Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people maintained. | <i>No data available</i> |
| Protect traditional knowledge, innovations and practices | |
| <i>Goal 9 Maintain socio-cultural diversity of indigenous and local communities</i> | |
| Target 9.1. Protect traditional knowledge, innovations and practices. | <ul style="list-style-type: none"> • Government continued to promote the development and preservation of national arts and culture and the expression of folklore and culture among local communities • The traditional knowledge, innovations and practices are recognized in the FNDP, Science and Technology Policy, and the National Policy on Environment • Traditional healers and modern doctors carried out research on effectiveness of traditional medicines in treating HIV/AIDs • Baseline survey on traditional knowledge conducted. |
| Target 9.2. Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit sharing. | <ul style="list-style-type: none"> • The FNDP and the National Policy on Environment recognize the role of local communities in the management of biological diversity. A draft Biodiversity Bill was developed to, among others address issues of access and benefit sharing and protect the rights of local communities over their traditional knowledge, innovations and practices. |

| Goals and targets | Relevant indicators |
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| Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources | |
| <i>Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources</i> | |
| Target 10.1. All access to genetic resources is in line with the Convention on Biological Diversity and its relevant provisions. | <ul style="list-style-type: none"> • Zambia made use of the Bonn Guidelines in preparing the draft Biodiversity Bill. |
| Target 10.2. Benefits arising from the commercial and other utilization of genetic resources shared in a fair and equitable way with the countries providing such resources in line with the Convention on Biological Diversity and its relevant provisions | <i>No data available</i> |
| Ensure provision of adequate resources | |
| <i>Goal 11: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention</i> | |
| Target 11.1. New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with Article 20. | <ul style="list-style-type: none"> • An Environment and Natural Resources Management and Mainstreaming Programme (ENRMMP) developed to strengthen the institutional capacity and establish a fund in the environment and natural resources sector. • An Institutional Cooperation Instrument between Zambia and Finland was initiated to strengthen cooperation in implementation of multilateral environmental agreements. |
| Target 11.2. Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with its Article 2 | <i>No data available</i> |

Annex IV: Targets of the Global Strategy for Plant Conservation

Target 1: A widely accessible working list of known plant species, as a step towards a complete world flora

No national targets established. There is a wealth of data on vascular plants in the country whose list has been compiled excluding the *algae* and *bryophytes*. The list contains four broad categories, pteridophytes, gymnosperms, monocotyledons and dicotyledons. The checklist provides Zambia with basic information for biodiversity management.

Target 2: A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels

No national targets established. As reported in the Third National Report, Zambia still needs to undertake a comprehensive assessment of the conservation status of all known plants in the country. The development of a National Red Data List is going on. During the report period Zambia conducted an Integrated Land Use Assessment that included the status of some higher plant species. The University of Zambia Herbarium continued to update the plant database using the PRECIS software in order to adopt standardization of data with the sub-region.

Target 3: Development of models with protocols for plant conservation and sustainable use, based on research and practical experience

No national targets established. The University of Zambia continued to improve its Teaching Botanic Garden which was designed to serve as a field laboratory for students of botany, ecology and biogeography. The facility was used for practical guidance on how to conduct plant conservation and sustainable use activities in particular settings and integrating *in-situ* and *ex-situ* conservation approaches. Human and financial constraints affected progress.

The Munda Wanga Botanical Gardens continued plant collections.

Target 4: At least 10 per cent of each of the world's ecological regions effectively conserved

No national targets established. Zambia has 14 major ecosystems based on vegetation types whose conservation is vital to biological diversity. However no quantitative targets have been established expect that these ecosystems continued to provide goods and services and are partly protected through the protected areas.

Through the reclassification and effective management of the national protected areas system project a gap analysis of the representation of the different vegetation types in protected areas designated for the conservation of biodiversity was carried out. In addition, the Integrated Land Use Assessment produced vegetation and land use maps for each province. The maps contribute towards sustainable management of biological resources in the country as they assist in planning and decision making regarding the management of biological resources. Inadequate financial resources and specialized personnel hamper continuous comprehensive assessments.

Target 5: Protection of 50 per cent of the most important areas for plant diversity assured

No national targets established. Though most areas of important plant diversity are protected under the current system of protected areas of national parks, game management areas and

local and national forest reserves, threats of encroachment, illegal settlements and habitat destruction are quite evident. More than 50% of forest reserves are encroached. (Section 1.2.2 Forest Reserves).

Target 6: At least 30 per cent of production lands managed consistent with the conservation of plant diversity

No national target established. The country has more than 30% of its production land under the protected areas that have been incorporated in national plans especially in the ZFAP. Even though there is impressive coverage of trees and plants slash and burn, traditional farming methods negatively impact on these forests and woodlands. Equally modern mechanized farming methods that require the clearing of land contribute to the deforestation and degradation of wooded areas. In order to address and effectively conserve biodiversity the current forest policy and wildlife policy are being revised.

Institutional weaknesses of the Zambia Wildlife Authority and Forestry Department hampered effective management of protected areas. However, there were attempts to strengthen the Forestry Department through restructuring. In addition, new initiative approaches such as Public-Private-Partnership to involve local communities and the private sector in effective management of protected areas are being introduced.

Target 7: 60 per cent of the world's threatened species conserved in situ.

No national target. Zambia has 41.4% as protected areas and GMAs where threatened species are conserved *in-situ*. In addition, 7 Zambian Habitats and 146 plant species have been defined as threatened in the Southern Africa Plant Red Data List (Third National Report). The country developed Management Effectiveness Tracking Tool for management of protected areas and also carried out vegetation gap analysis that indicated the distribution of vegetation classes to nine distinctive classes.

The results of ILUA carried out from 2005-2008 indicated that threatened species outside the protected areas were very vulnerable due to inadequate capacities, weak incentives and ineffective coordination of conservation agencies.

Target 8: 60 per cent of threatened plant species in accessible ex-situ collections, preferably in the country of origin, and 10 per cent of them included in recovery and restoration programmes

No national target. The development of a National Red Data List is on-going. The restocking of livestock such as cattle commenced in Southern Province even though not much research has been going on in the conservation of traditional livestock varieties. Weak database, shortage of specialize skills and inadequate finances major hindrance.

Target 9: 70 per cent of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated indigenous and local knowledge maintained

Conservation of the genetic diversity of traditional crop varieties and their wildlife relatives and the genetic diversity of traditional livestock breeds established as national target. The National Plant Genetic Resource Centre continued to maintain a collection of germ-plasm accessions and more than 3,000 accessions have been made so far. The work on identification of medicinal plants including determination of the ecological requirements of each species in collaboration with the Traditional Healers and Practitioners Association of Zambia was concluded but the results are not yet published.

Target 10: Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems

No national target established. Management plan and strategy have been developed for Invasive Alien Species. *Mimosa pigra* at Lochinvar National Park and of *Lantana Camara* at Victoria Falls pilot sites have been cleared.

Target 11: No species of wild flora endangered by international trade

Data relating to international trade in wild flora is scanty and therefore difficult to determine the impact of trade on particular species of plants. However, even though not verified and quantified, species of *Pterocarpus angolensis* and *Baikiaea plurijuga* species have been affected.

Target 12: 30 percent of plant-based products derived from sources that are sustainably managed

Not attained due to continued high rate of deforestation as a result of poor agricultural practices, encroachment, bush fires, settlement, charcoal production, firewood collection, and illegal timber harvesting which has led to land degradation and loss of biodiversity. Illegal logging of high value species such as *Aphzelia quanzensis*, *Baikiaea plurijuga*, *Faurea saligna*, *Guibourtia coleosperma* and *Pterocarpus angolensis* was rampant.

The main constraints were weak capacity and financial resources to effectively intervene the rapidly increasing deforestation. Further, lack of decentralized resource management has had a bearing on the effectiveness of law enforcement. Poor coordination between other government departments and Forestry Department reduced the effectiveness of policy interventions. Lack of information on key development areas still remained a major obstacle to efforts to develop appropriate policies.

Target 13: The decline of plant resources, and associated indigenous and local knowledge innovations and practices that support sustainable livelihoods, local food security and health care, halted.

Not achieved even though a baseline survey of indigenous knowledge was conducted by the Ministry of Science, Technology Vocational Training. However, the findings have not been put to use. Further inadequate operational resources and skills affected the implementation of this target.

Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes

Various national programmes and projects on biodiversity conservation have continued to incorporate communication, education and public awareness activities. The FNDP and NAPA have given priority to environment education and awareness. The education and awareness activities have been undertaken through local institutions such as Community Resource Boards, Joint Forest Management Committees and Village Fisheries Committees. Translating technical materials into simpler language for the local people remained a challenge for effective communication of the importance of biodiversity and the need for its conservation.

Target 15: The number of trained people working with appropriate facilities in Plant Conservation Increased, according to national needs, to achieve the targets of this Strategy

No national target established. The University of Zambia and The Copperbelt University continued to offer training in Biodiversity Conservation subjects to students at first and second degree level. Financial resources to cater for training remained a major constraint.

Target 16: Networks for plant conservation activities established or strengthened at national, regional and international levels

No national target established. The Natural Resources Consultative Forum though established faced operational problems due to lack of resources. Sustainability not assured in view of dependency on donor funds and difficulties in organizing local input to issues of concern amongst the stakeholders.

Annex V: Goals and Targets of the Programme of Work on Protected Areas

| PROGRAMME ELEMENT 1: Direct actions for planning, selecting, establishing, strengthening, and managing, protected area systems and sites | | |
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| Goal | Target | Progress |
| 1.1. To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals. | By 2010, terrestrially and 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area system is established as a contribution to (i) the goal of the Strategic Plan of the Convention and the World Summit on Sustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010; (ii) the MDGS – particularly goal 7 on ensuring environmental sustainability; and (iii) the Global Strategy for Plant Conservation. | <ul style="list-style-type: none"> • Vegetation Gap Analysis and Resources Mapping conducted in selected ecosystem areas • Studies conducted for a Protected Area Category System for Zambia to include new categories in addition to existing PA categories through the Reclassification and Effective Management of the National Protected Areas System Project. Proposed new categories include Natural Resources Sanctuaries, Nature Parks, National Reserves, Partnership Parks, Game Reserves (community/private), and Sacred Forests. |
| 1.2. To integrate protected areas into broader land- and seascapes and sectors so as to maintain ecological structure and function. | By 2015, all protected areas and protected area systems are integrated into the wider land- and seascape, and relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity and the concept, where appropriate, of ecological networks. | <ul style="list-style-type: none"> • Initial process started with wildlife protected areas. However, with limited capacity and resources this may not be achieved |
| 1.3. To establish and strengthen regional networks, transboundary protected areas (TBPAs) and collaboration between neighbouring protected areas across national boundaries. | Establish and strengthen by 2010/2012 trans-boundary protected areas, other forms of collaboration between neighbouring protected areas across national boundaries and regional networks, to enhance the conservation and sustainable use of biological diversity, implementing the ecosystem approach, and improving international cooperation. | <ul style="list-style-type: none"> • Collaboration with neighbouring countries such as Malawi, Botswana, Namibia, Mozambique, Tanzania and Zimbabwe to manage trans-boundary natural resources initiated. These include, The Lake Tanganyika Integrated Management Project (Burundi, Congo DR, Tanzania and Zambia), the Zimbabwe Mozambique Zambia Trans-frontier Conservation Area, Kavango-Zambezi Trans-frontier Conservation Area (Angola, Botswana, Namibia, Zambia and Zimbabwe) |
| 1.4. To substantially improve site-based protected area planning and management. | All protected areas to have effective management in existence by 2012, using participatory and science-based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and monitoring programmes, drawing upon existing methodologies and a long-term management plan with active stakeholder involvement. | <ul style="list-style-type: none"> • Public/Private/Partnership arrangements that follow commonly accepted principles of models developed and tested in selected protected areas (Bangweulu and Chiawa Demonstration Sites). |
| 1.5. To prevent and mitigate the negative impacts of key threats to protected areas. | By 2008, effective mechanisms for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas are in place. | <ul style="list-style-type: none"> • National Adaptation Programme of Action (NAPA) on climate change developed. Identified natural resources (wildlife and forest) sector as vulnerable and proposes adaptation measures. |

| PROGRAMME ELEMENT 2: GOVERNANCE, PARTICIPATION, EQUITY AND BENEFIT SHARING | | |
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| Goal | Target | Progress |
| 2.1 To promote equity and benefit-sharing | Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas. | <ul style="list-style-type: none"> • Legislation development commenced |
| 2.2 To enhance and secure involvement of indigenous and local communities and relevant stakeholders | Full and effective participation by 2008, of indigenous and local communities, in full respect of their rights and recognition of their responsibilities, consistent with national law and applicable international obligations, and the participation of relevant stakeholders in the management of existing, and the establishment and management of new, protected areas. | <ul style="list-style-type: none"> • Involvement of local communities in management of biological resources (wildlife, fisheries, forests) through appropriate mechanisms. • Policy and legislation review commenced |
| PROGRAMME ELEMENT 3: ENABLING ACTIVITIES | | |
| Goal | Target | Progress |
| 3.1 To provide an enabling policy, institutional and socio-economic environment for protected areas. | By 2008 review and revise policies as appropriate, including use of social and economic valuation and incentives, to provide a supportive enabling environment for more effective establishment and management of protected areas and protected areas systems. | <ul style="list-style-type: none"> • Appropriate policy developed (National Policy on Environment) to support local community involvement in the management of natural resources • Review of sector policies (wildlife and forestry) commenced |
| 3.2 To build capacity for the planning, establishment and management of protected areas. | By 2010, comprehensive capacity building programmes and initiatives are implemented to develop knowledge and skills at individual, community and institutional levels, and raise professional standards | <ul style="list-style-type: none"> • Initiated implementation of the Environment and Natural Resources Management and Mainstreaming Programme aimed at improving coordination and implementation capacity of the environment and natural resources management sector in Zambia |
| 3.3 To develop, apply and transfer appropriate technologies for protected areas. | By 2010 the development, validation, and transfer of appropriate technologies and innovative approaches for the effective management of protected areas is substantially improved, taking into account decisions of the Conference of the Parties on technology transfer and cooperation. | <ul style="list-style-type: none"> • Not yet incorporated in national plans or programmes |
| 3.4 To ensure financial sustainability of protected areas and national and regional systems of protected areas. | By 2008, sufficient financial, technical and other resources to meet the costs to effectively implement and manage national and regional systems of protected areas are secured, including both from national and international sources, particularly to support the needs of developing countries and countries with economies in transition and small island developing States. | <ul style="list-style-type: none"> • Financial viability of national parks and game management areas conducted |

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| 3.5 | To strengthen communication, education and public awareness. | By 2008 public awareness, understanding and appreciation of the importance and benefits of protected areas is significantly increased | <ul style="list-style-type: none"> • Commemoration of world environment days observed |
| PROGRAMME ELEMENT 4: Standards, assessment, and monitoring | | | |
| | Goal | Target | Progress |
| 4.1 | To develop and adopt minimum standards and best practices for national and regional protected area systems. | By 2008, standards, criteria, and best practices for planning, selecting, establishing, managing and governance of national and regional systems of protected areas are developed and adopted. | <ul style="list-style-type: none"> • The management effectiveness of protected areas and the threats and pressures to a protected area tools have been developed. The financial cost of effectiveness Model developed |
| 4.2 | To evaluate and improve the effectiveness of protected areas management. | By 2010, frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties | <ul style="list-style-type: none"> • Framework for monitoring and Evaluation being developed under The reclassification project. The Integrated Land Use Assessment developed models of assessing forest resources |
| 4.3 | To assess and monitor protected area status and trends. | By 2010, national and regional systems are established to enable effective monitoring of protected-area coverage, status and trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets | <ul style="list-style-type: none"> • The Management Effectiveness Tracking Tool of Protected Areas for Zambia (METPAZ) adapted from World Bank/WWF Alliance for Forest Conservation and Sustainable Use Management Effectiveness Tracking Tool (METT). Tool designed to measure management effectiveness, and threats and pressures of PAs. |
| 4.4 | To ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and protected area systems. | Scientific knowledge relevant to protected areas is further developed as a contribution to their establishment, effectiveness, and management | <ul style="list-style-type: none"> • Not yet incorporated into national target |