



SOUTHERN AFRICAN DEVELOPMENT COMMUNITY

Regional Biodiversity Strategy



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FOREWORD

Biological resources are a strategic issue in the Southern African Development Community (SADC). They account for a significant proportion of the region's Gross Domestic Product and are a source of livelihood for the bulk of its citizens. This explains why the maintenance, enhancement or restoration of biodiversity is viewed as a means for achieving the region's socio-economic development and not as an end in itself.

We are mindful that part of our rich natural heritage has global significance for the world's climate and for agricultural and industrial development. In addition, 26 of the 82 sites globally chosen for their species richness and endemism in sub Saharan Africa are in southern Africa and more than 40% of the region's species are endemic. We however note, with concern, that despite the existence of this biological wealth, the region remains poor largely due to its inability to transform its natural resource capital into value added goods and services.

Throughout centuries, the people of southern Africa have developed strategies for tending and caring for their biological resources for the benefit of their own and future generations. Unfortunately, the capacity of nature to provide for us is rapidly diminishing due to population pressures and changes in the socio-economic environment, including urbanization. We however realize that the successful conservation and sustainable use of the region's biological resources depends on trans-boundary cooperation. It is therefore gratifying to note that there is sufficient political will for trans-boundary cooperation within SADC as enshrined in its vision of "A common future for all countries and peoples of southern Africa" and its desire to confront underdevelopment and marginalization by jointly addressing mutual aspirations and problems.

This Regional Biodiversity Strategy provides a framework for cooperation on biodiversity issues that transcend national boundaries. It is premised on the fact that the state of the environment, including biodiversity, is a major determinant of the growth and development of the region and impacts on the lives of its citizens. It is against this background that the Regional Biodiversity Strategy should be viewed as a vehicle for implementing the biodiversity components of our Regional Indicative Strategic Development Plan. The latter embodies the ideals of the New Partnership for Africa's Development and the Millennium Development Goals.

More specifically, the Regional Biodiversity Strategy highlights priority actions required to unleash the wealth locked up in the region's biological resources through value addition and "biotrade", on a sustained basis. It also articulates ways to ensure that the peoples of southern Africa and the world at large mutually benefit from the region's biological heritage through appropriate access and benefit sharing arrangements.

In advancing this Regional Biodiversity Strategy we remain mindful that natural resources alone are not a panacea to southern Africa's development problems. Consequently, it will only complement other development strategies being pursued by the region. We also recognize the need to aggressively market the Regional Biodiversity Strategy and to bring on board all relevant stakeholders, including our development partners, for its successful implementation.

Festus Mogae

President of the Republic of Botswana and Chairperson of the Southern African Development Community.

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The Regional Biodiversity Strategy was developed through a participatory process that involved extensive stakeholder consultations within SADC Member States. Government agencies, the private sector, non-governmental organizations, academic institutions and international cooperating partners participated in the consultations through various mechanisms, including national and regional workshops. Inputs from these fora greatly enriched the document.

Dr Enos Shumba, Dr George Phiri and Mr Robert Ondhowe of the SADC BSP Management Unit compiled the Regional Biodiversity Strategy. The process was ably guided by Mr. Nik Sekhran, Mr Leonard Dikobe, Mr Steve Nanthambwe, Dr James Murombedzi and Mrs Tabeth Chiuta of the Programme's Coordination Committee and Mrs Dollina Malepa, Mr Steve Zuke and Mrs Anselmina Liphola of a Task Force constituted by the Programme's Regional Steering Committee. The document greatly benefited from independent inputs made by Dr Luis Navarro, Dr Yemi Katerere, Mr Jonathan Timberlake, Dr Phoebe Barnard, Mr Frank Kufakwanda, Dr Harrison Kojwang, Dr Allan Rogers and Dr Steve Osofsky.

ACRONYMS

ABS	Access and Benefit Sharing
ADB	African Development Bank
AHEAD	Animal Health for the Environment And Development
BSP	Biodiversity Support Programme
CIFOR	International Centre for Forestry Research
CHM	Clearing House Mechanism
CBNRM	Community Based Natural Resource Management
CITES	International Convention on Trade in Endangered Species
CBD	Convention on Biological Diversity
CSIR	Council for Scientific and Industrial Research
EIA	Environmental Impact Assessment
FANR	Food, Agriculture and Natural Resources
FAO	Food and Agricultural Organization
GMOs	Genetically Modified Organisms
GEF	Global Environment Facility
GDP	Gross Domestic Product
HIV/AIDS	Human Immune-Deficiency Virus/Acquired Immune Deficiency Syndrome
IAS	Invasive Alien Species
ICRAF	World Agroforestry Centre
IUCN	World Conservation Union
MDGs	Millennium Development Goals
NBSAP	National Biodiversity Strategy and Action Plan
NEPAD	New Partnership for Africa's Development
NGOs	Non Governmental Organizations
NTFPs	Non Timber Forest Products
RISDP	Regional Indicative Strategic Development Plan
R&D	Research and Development
SADC	Southern African Development Community
SARDC	Southern African Research and Documentation Centre
SNC	SADC National Committee
TBNRM	Trans-boundary Natural Resources Management
TFCAs	Trans-frontier Conservation Areas
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WCS	Wildlife Conservation Society
WIMSA	Working Group of Indigenous Minorities in Southern Africa
WWF	World Wide Fund for the Conservation of Nature

EXECUTIVE SUMMARY

The Southern Africa Development Community (SADC) is rich in biological resources, some of which have global significance. Most biodiversity issues and values in the region transcend national boundaries. The values are building blocks for a variety of ecosystem services; the most important of which are water, maintenance of soil fertility and absorption of pollutants. In addition, several species of mammals, birds, butterflies and fish exhibit trans-boundary migration patterns. Over half of the Gross Domestic Product of SADC Member States comes from primary sectors of production that are based on biodiversity in its broadest sense. Furthermore, most of their citizens live in rural areas where they depend on natural resources for survival. This underpins the importance of biological resources in southern Africa. The region is characterized by high levels of poverty that emanate from its inability to effectively transform its biological resource capital into goods and services for socio-economic development. It is also facing serious environmental challenges that are leading to the loss of its rich biological heritage and ecological processes.

Biodiversity is a basic resource for sustainable development in southern Africa. It is also central in the region's drive to meet the Millennium Development Goals (MDGs) to which its Member States aspire. All Member States have signed the Convention on Biological Diversity (CBD) that calls on them to "conserve biodiversity, use it sustainably, and equitably share benefits therefrom. To meet these objectives, Member States were asked (via Article 6A of the Convention) to produce National Biodiversity Strategy and Action Plans (NBSAPs). The Plans have or are in the process of being completed.

The objectives of this Regional Biodiversity Strategy are to:

- Provide guidelines that build the region's capacity to implement provisions of the CBD;
- Provide a framework for obtaining regional consensus on key biodiversity issues;
- Act as a vehicle for forming partnerships with development partners on trans-boundary biodiversity issues; and,
- Provide a framework for cooperation between Member States and with relevant multilateral environmental agreements.

The Regional Biodiversity Strategy is built around values of biodiversity and constraints to biodiversity conservation and its sustainable use in the region. These were formulated from country level constraints articulated in national planning frameworks such as NBSAPs. A wide range of stakeholders participated in the Regional Strategy development process.

The following regional constraints were given highest priority:

- Limited alternative livelihood opportunities outside agriculture and natural resource exploitation, thereby increasing pressure on natural resources;
- Inadequate biodiversity inventory and monitoring systems, and knowledge on and ability to handle biodiversity information;
- Inadequate incentives for biodiversity conservation and its sustainable use;
- Low levels of awareness, knowledge and appreciation of biodiversity at various levels;
- Weak institutional and legal frameworks for implementing biodiversity initiatives;

- Limited and unsustainable funding for the implementation of Biodiversity Work Plans from the CBD;
- Inadequate research and development approaches for implementing biodiversity programmes; and,
- Limited attention to the management of Genetically Modified Organisms and Invasive Alien Species, both of which are major issues in southern Africa.

The Regional Biodiversity Strategy is presented in the form of a matrix that highlights strategies to address the priority regional constraints and focal areas (sets of activities) for specific project development. Its scope is threefold:

- Enhancing the region's economic and business base by adding value to its biological resources and engaging in "Biotrade";
- Ensuring that economic opportunities from "Biotrade" and related initiatives do not lead to the unsustainable use of the region's biodiversity; and,
- Developing and promoting regional programmes on: biodiversity awareness; capacity building; research and development; and sustainable financing.

Fifty focal areas that address the eight regional constraints were identified. They cut across the traditional biodiversity sectors of forestry, wildlife, aquatic life and agriculture and focus on species and habits of economic importance. In addition, they address the poverty-environment-governance challenges articulated in the Regional Indicative Strategic Development Plan, the New Partnership for Africa's Development and the MDGs.

The operationalization of focal areas of the Regional Biodiversity Strategy will depend on the availability of both internal and external funding. The interests of the funding sources will therefore influence their sequencing. The following activities will be carried out on the Regional Biodiversity Strategy:

- SADC will extensively and continuously market the Regional Strategy and its activities to various stakeholders and partners;
- The SADC Secretariat will encourage Member States and development partners to develop and implement projects within their preferred focal areas;
- The SADC Secretariat and partners will develop concept notes and detailed project proposals within the focal areas. These will be submitted to interested development partners as they come on stream; and,
- SADC will review the Regional Biodiversity Strategy every five years.

REGIONAL BIODIVERSITY STRATEGY

1.0 Introduction

1.1 Vision, goal and objectives

The vision of the Regional Biodiversity Strategy is to conserve biodiversity across the Southern African Development Community (SADC) and to sustain the region's economic and social development in harmony with the spiritual and cultural values of its people. Its goal is to promote equitable and regulated access to, sharing of benefits from, and responsibilities for protecting biodiversity in the SADC region.

The purpose of the Regional Biodiversity Strategy is to provide a framework for regional cooperation in biodiversity issues that transcend national boundaries and to stimulate the combined and synergistic efforts by SADC Member States and their communities in biodiversity conservation and its sustainable use. It contributes to the achievement of SADC's goals of social and economic development and poverty eradication as embedded in the Regional Indicative Strategic Development Plan (RISDP); the New Partnership for Africa's Development (NEPAD) Environmental Action Plan; and the Millennium Development Goals (MDGs). Its specific objectives are to:

- Provide guidelines that build SADC's capacity to implement provisions of the Convention on Biological Diversity (CBD) and to address biodiversity challenges more effectively;
- Provide a framework for obtaining regional consensus on key biodiversity issues and enable SADC to articulate unified positions at international fora such as the Conference of Parties to the CBD;
- Act as a vehicle for forging partnerships with various development partners and the international community on biodiversity issues; and,
- Provide a framework for cooperating with relevant international instruments such as the United Nations Convention to Combat Desertification (UNCCD), the United Nations Framework Convention on Climate Change (UNFCCC), the Law of the Sea, the Convention on Migratory Species, the Convention on International Trade in Endangered Species (CITES) and the Ramsar Convention on Wetlands.

Box 1 provides a definition of biodiversity. The Regional Strategy focuses on promoting a decentralized access and management of biodiversity in order to enhance its protection and sustain its contribution to social and economic development with emphasis on poverty eradication. It recognizes that biodiversity is a source of wealth and development that is renewable but fragile and needs care to sustain its contribution to wealth and development. The Regional Strategy acknowledges that because of its dispersed nature and exposure to human populations, the protection and sustainable use of biodiversity needs to be decentralized and equitable for it to be effective. "Equitable" refers to "fair and optimal" as opposed to the utopian "equality" (Navarro, personal com).

Box 1: What is biodiversity?

Biodiversity is the variation between ecosystems and habitats; the variation between different species; and the genetic variation within individual species. It is a system of interactions between genes, species, and the ecosystems they form, influencing and influenced by ecological and evolutionary processes. The processes help to sustain biological systems and to ensure their productivity. Biodiversity forms the foundation of the vast array of eco-system products and services that contribute to human well-being and drives the economies of SADC Member States.

1.2 Regional overview

SADC consists of thirteen Member States located in the southern part of the African continent. They are Angola, Botswana, the Democratic Republic of Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. The region is rich in biological resources, some of which have global significance. Most biodiversity issues in SADC transcend national boundaries and several species of mammals, birds, butterflies and fish exhibit trans-boundary migration patterns. The Regional Biodiversity Strategy covers all the thirteen SADC Member States who are also signatories to the CBD. However, it does not assume the individual country responsibilities under the Convention.

Over 50% of the Gross Domestic Product (GDP) of SADC Member States comes from primary sectors of production such as agriculture, mining, forestry and wildlife. Furthermore, between 40% and 85% of their citizens live in rural areas where they depend on natural resources for survival. This scenario underlines the overriding importance of biological resources in southern Africa. Although the region is endowed with natural resources, it is characterized by high levels of poverty that emanate from its inability to effectively transform this biological capital into goods and services for social and economic development and poverty eradication. Furthermore, SADC is facing serious environmental challenges/threats largely originating from increasing human population relative to resource availability; agricultural expansion coupled with declining land productivity; continued reliance on wood fuel; increasing land degradation; and climate change. Box 2 highlights the threat caused to biodiversity by climate change. Even more dominant is the continuing erosion of human capacity due to HIV/AIDS and the resultant inability of Member States to adequately address the foregoing challenges. These factors are resulting in the loss of biological resources and ecological processes.

However, the Regional Biodiversity Strategy recognizes that the restoration, maintenance or enhancement of biodiversity is not an end in itself, but a means to achieving the region's socio-economic development goals. Consequently, it focuses on species and habitats of economic importance.



The Regional Biodiversity Strategy focuses on species and habitats of economic importance

Box 2: Climate change as a threat to biodiversity

Climate change refers to a change in climate attributed directly or indirectly to human activity that alters the composition of the global atmosphere. This is additional to natural climate variability observed over comparative time periods. Climate change alters the spatial and temporal patterns of temperature and precipitation, the fundamental factors that determine the distribution and productivity of vegetation. Among the potential impacts of carbon dioxide induced climate change in the region are:

- Drying of woodlands and savannas of the semi-arid and sub-humid areas;
- Altering the frequency, intensity, seasonality and extent of vegetation fires. Such fires are critical for maintaining areas such as miombo woodlands and the fynbos of the Cape;
- Reducing the yields of certain cereal crops such as maize, sorghum and rice; and,
- Negatively impacting on freshwater and marine ecosystems.

It is, however, worth noting that southern Africa's vast forest resources, especially the miombo and similar woodlands, are significant sinks for carbon dioxide and thus have a potential role in alleviating and balancing emissions from industrialized countries through carbon sequestration. This underscores the need to maintain as much forest cover as possible, recognizing other economic activities that compete with forestry. Furthermore, it provides opportunities for the region to benefit from the Clean Development Mechanism under the Kyoto Protocol.



Southern Africa's vast forest resources, especially the miombo and similar woodlands, are significant sinks for carbon dioxide and thus have a potential role in alleviating and balancing emissions from Industrialized countries .

1.3 Methodology used

The realization of the Regional Biodiversity Strategy's objectives requires a thorough analysis of available instruments and their status in relation to biodiversity conservation and its sustainable use in the region. The instruments, commonly referred to as drivers of socio-economic development, fall into three categories namely; political, institutional and technological. A constraint analysis was used to

assess the status of these instruments and to articulate a problem statement for the Regional Strategy using a bottom up approach. The analysis was based on national constraints contained in National Biodiversity Strategy and Action Plans (NBSAPs) and other national level planning frameworks (e.g. Poverty Reduction Strategy Papers, National Conservation Strategies, National Environment Action Plans and State of the Environment Reports) to arrive at regional constraints. Criteria used to prioritize the constraints included their trans-boundary nature (in terms of the number of countries affected) and the ability of opportunities that emanate from them to contribute to SADC's goals of social and economic development and poverty eradication. The constraints were continuously reviewed in line with stakeholder and specialist inputs and emerging opportunities at various levels.

The rationale for adopting a constraint-based approach in developing a problem statement for the Regional Strategy was that constraints (encompassing policy, institutional and technical considerations) determine what people can do, want to do and end up doing. For example, they determine the biodiversity and complementary resources that SADC citizens can, individually or collectively, access and use for their livelihood and development; their knowledge and skills to use such resources; and their motivations. Motivations determine the benefits and ways in which citizens utilize the knowledge skills and resources they have or can access (Navarro, personal com).

The development of the Regional Strategy involved a wide range of stakeholders through various processes that included the following:

- Regional consultative workshops held in Swaziland and Zambia in June 2002 and November 2002 respectively;
- A meeting of the Task Force of the SADC Biodiversity Support Programme's Regional Steering Committee held in Swaziland in February 2005;
- An External Peer Review of the draft Strategy carried out between February and April 2005. Some 16 technical, policy and institutional experts from government; local, regional and international non-governmental organizations (NGOs); universities; the private sector and donor agencies reviewed the document;
- Country level consultations on the document were carried out between April and May 2005; and,
- A regional workshop to discuss and finalize the document was held in South Africa in June 2005. Two biodiversity experts from each Member State (one government and one NGO representative) and representatives of regional and international organizations attended the workshop.

1.4 Outline of document

This document first presents the problem statement in the form of regional constraints to biodiversity conservation and its sustainable use in southern Africa. The scope of the Regional Strategy and focal areas (sets of activities) for detailed project proposal development under each constraint are then given. The Regional Strategy's implementation framework is presented in the last section.

An introduction to the Regional Biodiversity Strategy is given in Annex I while Annex II highlights the status of biodiversity in southern Africa. Constraints to biodiversity conservation in individual Member States are presented in Annex III.

2.0 Problem statement

2.1 Preamble

A regional consultative workshop convened in Swaziland in June 2002 identified and prioritized a number of regional constraints to biodiversity conservation and its sustainable use in southern Africa. It initially identified 26 constraints. These were reduced and consolidated to a set of eight that were felt to be manageable within the context of the Regional Biodiversity Strategy. They are presented in Table 1 and constitute the problem statement for the Regional Strategy.

Table 1: Regional constraints to biodiversity conservation and its sustainable use; and strategies to address them.

Regional constraint	Strategy
1. Increased pressure and demand on biodiversity and agricultural land due to limited alternative livelihood opportunities outside agriculture and natural resource exploitation.	1. Facilitate the development and implementation of affordable, viable and acceptable alternatives for economic development and human survival.
2. Inadequate biodiversity inventory and monitoring systems, and knowledge on and ability to handle biodiversity information.	2. Develop and implement comprehensive but simple biodiversity inventory and monitoring projects covering key species of flora, fauna and habitats; and skills to handle and package the information, leading to improved knowledge and better management of biodiversity.
3. Inadequate incentives for biodiversity conservation and its sustainable use.	3. Enhance the economic value of biological resources and develop mechanisms to equitably share the resultant benefits.
4. Low levels of awareness, knowledge and appreciation of biological resources at various levels.	4. Enhance awareness, information and knowledge on biological resources at various stakeholder levels.
5. Weak institutional and legal frameworks for carrying out biodiversity initiatives.	5. Strengthen institutional and legal frameworks for implementing biodiversity initiatives.

6. Limited and unsustainable funding for implementing biodiversity programmes.	6. Provide a sustainable and readily accessible financial base to support biodiversity programmes.
7. Inadequate research and development approaches for biodiversity initiatives.	7. Develop appropriate research and development approaches for biodiversity initiatives.
8. Limited attention to the management of Genetically Modified Organisms (GMOs) and Invasive Alien Species (IAS).	8. Improve the region's capacity to manage GMOs and IAS.

2.2 Constraints

This section summaries the eight constraints to biodiversity conservation and its sustainable use in the region.

2.2.1 Increased pressure and demand on biodiversity and agricultural land due to limited alternative livelihood opportunities outside agriculture and natural resource exploitation.

The economies of most SADC Member States are based on agriculture and the majority of the inhabitants practice subsistence farming. Consequently, forestry and wildlife habitats continue to give way to agricultural expansion to meet the food requirements of the growing population. Furthermore, there is limited value addition to agricultural and natural resources products that comprise the backbone of the region's economies.

With respect to energy sources, fuel wood and charcoal provide more than 50% of the region's energy requirements. This is largely because alternative energy sources such as electricity and kerosene are very expensive and/or not readily available. The net effect of this has been excessive tree cutting to meet the energy needs of rural and urban dwellers.

Unfortunately, very little effort has been put into broadening the existing energy sources or increasing their productivity. For example, although forest management plans have been developed for a number of indigenous forests in the region, most of them have not been implemented. One of the reasons for this is that existing technologies on indigenous forest management are inappropriate as they only focus on commercial timber production and not on the production of multiple products and services that are needed by local people.

It is also worth noting that at the community level, natural resources continue to be the last line of defence in the face of calamities such as droughts that have become a common feature in southern Africa.



At community level, natural resources are the last line of defense for survival.

2.2.2 Inadequate biodiversity inventory and monitoring systems, and knowledge on and ability to handle biodiversity information.

There have been limited national and regional level inventories of various biodiversity components as illustrated by the following:

- Only the large and commercial species of wildlife have been regularly inventoried and monitored because of their importance in national economies. Similarly, regular inventory and monitoring programmes are usually in place for commercial indigenous timber species and exotic timber plantations. Other species that provide a range of timber and non-timber forest products to local communities have not been catered for. This is also true of agro-biodiversity and aquatic biodiversity where inventories and monitoring systems are only in place for species of economic importance such as cash crops and fish respectively.
- The monitoring of biodiversity habitats, some of which are under extreme pressure (Box 3), is often lacking. However, such information is critical for the effective management of cross-border initiatives such as Trans-boundary Natural Resource Management (TBNRM) programmes and internationally shared water resources. Box 3 depicts the pressure being exerted on some coastal habitats.

Other constraints associated with the existing biodiversity inventory and monitoring systems in the region include the following:

- The inventory and monitoring methods tend to vary between countries. This makes it difficult to compare results, especially on trans-boundary initiatives. Furthermore, the technical and institutional capacity to conduct inventories and monitoring studies varies across the region. The capacity to analyse and utilize the available knowledge is also limited.
- The existing inventory and monitoring systems do not take into account the values and aspirations of local people on the basis of their indigenous knowledge. Such knowledge has, and continues to play an important role in areas such as food security; agricultural development; and human, animal and plant health. Its incorporation into biodiversity inventory and monitoring systems is therefore critical given that local communities have lived with and managed biological resources for centuries.
- There have been no incentives to inventory and monitor biodiversity except in a few habitats such as protected areas and for species of economic importance.



Veld products provide a range of timber and non-timber forest products (e.g. fuel wood) to local communities. However, they are not catered for in most inventory and monitoring programmes

Box 3: Some coastal habitats are under extreme pressure.

Coastal erosion is a growing problem that is exacerbated by the upstream construction of dams, the development of coastal infrastructure such as artificial lagoons and the clearing of mangroves. On the east coast of southern Africa, coral reefs and sea grass beds are being silted by excessive upstream erosion and sediment discharge. Once settled, the sediments clog the delicate filter feeding apparatus of corals and other reef feeding organisms. In addition, the mining of sand, corals, limestone and shells depletes the buffer zone provided by coral reefs and exposes shores to wave action, storm surges and inundation. Coastal erosion is primarily caused by uncoordinated and inappropriate developments in the coastal zone, high population growth and the rapid development of the tourism industry. The need for Environmental Impact Assessments (EIAs) before such developments are embarked upon cannot be over emphasized. In addition, mitigatory measures recommended in EIA reports should be implemented timeously.

The lack of up to date information on biodiversity makes it difficult to effectively plan, manage and monitor biodiversity conservation and its sustainable use in the region. It also makes it difficult to demonstrate the value and impact of biodiversity losses to national and regional economies; to ecosystems; and to local communities.

2.2.3 Inadequate incentives for biodiversity conservation and its sustainable use.

There have been very limited incentives for biodiversity conservation and its sustainable use at both local and national levels in southern Africa. Reasons for this include communal land tenure systems; restrictive policies and legislation; and the low economic value of most biological resources. These issues are elaborated below.

a) Communal land tenure systems.

A significant proportion of land in the region is communally owned. Communities usually manage such land through communal user rights arrangements that give them open access to biological resources on the land. It has been argued that this tenure system is a disincentive to investment in agriculture and other key natural resources. Consequently, the highest rates of deforestation, wildlife decimation and land degradation in the region are taking place on communally owned land. However, some governance changes are now taking place to address this problem. For example, local bodies and communities are being empowered to manage and benefit from communal resources through a process of decentralization and devolution of administrative powers and responsibilities. Customary ownership of land is also receiving legal recognition in some Member States. For example, Mozambique's land reform law of 1997 recognizes customary land rights over local resources. Similarly, Namibia's 1998 land policy acknowledges the rights of local communities to woodland resources. On the other hand, Zimbabwe's land reform programme aims to transfer some land to the bulk of the country's citizens and decongest the currently over populated communal areas in the process. The impact of these policy changes on the sustainable management of biological resources in these countries still remains to be seen.

(b) Restrictive policies and legislation.

Most of the existing legislation in southern Africa precludes neighbouring communities from accessing goods and services from protected areas that account for about 15% of the region's total land area. Because of the restrictive legislation, protected areas have remained "islands of green" surrounded by degraded communally owned landscapes, and have the following attributes:

- Their rich forest and wildlife biodiversity has facilitated the development of a booming tourism industry;
- They provide habitats for endangered species of flora and fauna. For example, the bulk of "important bird areas" for threatened or endangered bird species such as the crowned crane and bearded vulture are found in protected areas; and,
- They offer opportunities for TBNRM initiatives as 70% of them lie across international boundaries.



*Protected areas provide refuge/
habitat for endangered species
of flora and fauna, e.g. Important Bird
Areas (IBA) for the crowned crane.*

Some of the region's protected areas are under siege from neighbouring communities who have resorted to poaching and establishing illegal settlements on them. Community participation and the development of appropriate mechanisms for benefit sharing are therefore critical for the sustainable management of these areas (Box 4). The Communal Areas Management Programme for Indigenous Resources in Zimbabwe presents a major participatory approach for communities that neighbour national parks areas. However, the approach has yet to find wide application for other natural resources such as commercial timber and veld products (Machena *et al*, 2005). Similar initiatives in other parts of SADC face challenges of inadequate benefit sharing arrangements and thus fail to address the household dilemma of how natural resources can benefit people and reduce poverty. For example, huge sums of money have been realized at the levels of District Councils, Community Trust Committees and similar structures with little conversion to household incomes. Should this pattern continue, the concept of community participation might lose popularity and political support (Dikobe, personal com.).

Box 4: Biodiversity for people (Visser *et al*, 2005)

Despite their weak political and economic clout, most communities remain key actors in the management of natural resources. They are the direct resource dwellers and users and are vital in influencing conservation outcomes. Conservation strategies therefore need to broaden their focus from strict policing of protected areas to the inclusion of local people in conservation management.

c) Low economic value of biological resources

Most biological resources have low economic value in their natural state and local communities derive little benefit from them (Box 5). Consequently, some Community Based Natural Resource Management (CBNRM) initiatives focusing on resources such as veld products have had limited success. This is largely because communities see little benefit in their continued participation in such projects due to their relatively low returns. Notwithstanding, it is interesting to note that experiences with CBNRM in southern Africa have greatly influenced global thinking on issues of sustainable use, especially in the case of the elephant. There is also growing interest in adding value and commercializing biological resources in the region. For example, the Southern African Natural Products Association (Phyto Trade Africa) is developing commercial opportunities from natural products (products derived from indigenous plants) for the benefit of rural communities in the SADC region. It does this through investment in Research and Development (R&D) and market development, whilst facilitating linkages between rural producers and private sector processors and manufacturers. Through the creative use of public funds, Phyto Trade Africa has been able to leverage significant private sector investment in R&D. However, it remains one of the very few cases in which favourable conditions for private sector investment have been successfully created (Le Bretton, personal com.). Given the foregoing, there is need to build incentives into technologies, policies and institutional support programmes that deal with biodiversity issues in southern Africa.



It is interesting to note that experiences with CBNRM in Southern Africa have greatly influenced Global thinking on issues of sustainable use, especially in the case of the Elephant.

Box 5: Inadequate incentives for sustainable natural resource management

Most Non-Timber Forest Products (NTFPs) and other natural resources are consumed or sold in their raw or semi processed forms at source. Consequently, the bulk of the resultant benefits from such resources accrue to outsiders such as middlemen and developed countries who add value to them through further processing and packaging. In addition, indigenous knowledge on these biological resources is not protected against biopiracy. This is partly because the global Intellectual Property Rights system does not recognize traditional knowledge, as it has not been properly documented. There is therefore need for a *sui generis* legislation that recognizes traditional knowledge and appropriately rewards its holders when it is exploited for commercial gain by outside parties.

2.2.4 Low levels of awareness, knowledge and appreciation of biological resources at various levels

In southern Africa, biological resources are largely considered as a medium for development and not a source of development. Consequently, very limited information and knowledge exists on them in terms of their value, status and potential. In situations where such information is available, it has not been properly packaged and disseminated to relevant stakeholders. As a result, natural resources are taken for granted and expected to avail themselves for exploitation whenever the need arises. This has led to the following:

- The wanton destruction of various biological resources for immediate gain without due consideration to future needs and impacts on the environment. For example, the commercial exploitation of plants for medicinal purposes and crafts has become an important component of forest conversion and is threatening a number of plant species (Box 6);
- Insufficient appreciation of the importance of biodiversity to national economies and sustainable livelihoods. This is partly reflected in the lower national budget allocations to

natural resource conservation and management. Furthermore, biodiversity has not been adequately and effectively mainstreamed into other sectors of national economies; and,

- Limited investment in areas such as value addition and bio-prospecting by national governments. This partly reflects the limited appreciation of what biological resources contribute to local and national economies.

Given the foregoing, the need for proper policy definition and guidance and motivation of stakeholders regarding benefits and ways to conserve and sustainably use biodiversity in the region cannot be over-emphasized.

Box 6: Loss of plant species

At the plant species level, there has been a marked decrease in the abundance of certain plants due to various human induced pressures. For example, the over-reliance on traditional medicinal plants for primary health care by the majority of the region's citizens has contributed to the over-exploitation of species such as *Waburgia salutaris* in Swaziland and Zimbabwe; and *Albizia brevifolia* in Namibia. Similarly, the commercialization of crafts like baskets and wood curios has led to a decline in tree species such as *Berchemia discolor* which is used as a palm leaf fibre dye in Botswana and Namibia. There has also been over-harvesting of *Azelia quanzensis* and *Pterocarpus angolensis* in a number of countries in response to the flourishing woodcraft industry. The proportion of threatened plant species in the region ranges from 0.5% in Angola to 40% in Swaziland (Prescott-Allen, 2001).



There is limited information on most of biological resources and ecosystems in terms of their value, status and potential.

2.2.5 Weak institutional and legal frameworks for implementing biodiversity initiatives

National level institutions dealing with biological resources in southern Africa are generally weak in policy formulation; the enforcement of legislation; the provision of management oversight on various resources; and the implementation of requirements of regional and international agreements to which their countries are a party. This can be attributed to inadequate human and financial resources and the relatively lower standing and appreciation of such institutions within most civil service structures. Unfortunately, some of the institutions have not been able to forge partnerships with NGOs and the private sector in order to effectively harness the available national capacities. Similarly, there has been

little effort to collectively harness the human capacity across Member States when dealing with multilateral environment agreements. In addition, local level institutions that deal with biological resources have been weak, especially under communal land tenure systems. However, there are now various attempts to create and/ or strengthen local institutions through capacity building initiatives and land reforms.

Most national policies and legal frameworks that deal with biodiversity issues have the following attributes:

- They have not been effectively enforced. This largely relates to phytosanitary requirements and controls on imports and exports in the case of Invasive Alien Species;
- They do not clearly articulate national and collective positions on TBNRM initiatives that advocate for the removal of barriers to wildlife, domestic animal and human movement within and across countries. This has major implications for animal health and disease control, production and exports in each country (Box 7).
- They tend to focus more on natural resource conservation and not on the need by communities to benefit from the resources, especially in protected areas; and,
- They do not provide guidelines on access to and benefits from biological resources by outside parties.

Despite the foregoing, some progress is being made in formulating legislation that regulates access to biological resources by outside parties. This is illustrated by the case of the Hoodia succulent, *Hoodia gordonii*, a plant with appetite suppressant qualities (Box 8). An important lesson that can be drawn from the Hoodia example is the need for a regional approach to the implementation of access and benefit sharing arrangements. Current estimates of populations of the San people in the region are: 55 000 in Botswana, 35 000 in Namibia, 7 000 in South Africa and approximately 8 000 in Angola, Zambia, and Zimbabwe. The geographical distribution of the plant is primarily in South Africa and Namibia, while related species occur in Angola and Botswana. However, the parties to the benefit sharing discussions were the South African stakeholders in the form of the inventors, CSIR, and the South African San Council (representatives of indigenous knowledge owners in southern African countries, through the Working Group of Indigenous Minorities in Southern Africa-WIMSA).

Box 7: TBNRM and animal disease control

Trans-boundary Natural Resource Management (TBNRM) is defined as any process of cooperation across boundaries that facilitates or improves the management of natural resources for the benefit of all parties concerned. The responsibility for managing TBNRM initiatives lies with the Member States concerned. This is largely because they depend on or assume similar levels of devolution and equally supportive policies and legislation across the participating countries. Consequently, there is need for national consensus, policies and capabilities on the subject.

The control and containment of livestock diseases has, in the past, relied on game fences and the control of wild and domestic animal movements and translocations. The prospect of removing barriers to wildlife and livestock movement therefore has major implications for animal health and disease control strategies under TBNRM. It could also have wider implications for disease control in the participating countries (Osofsky *et al*, 2005). There is therefore need for a policy framework on animal health and disease control under TBNRM.



The prospect of removing barriers to wildlife and livestock movement has major implications for animal health and disease control strategies under TBNRM.

Box 8: The Hoodia succulent and the San people

The San people's traditional knowledge on the Hoodia plant, freely conveyed to anthropologists and researchers many decades ago, provided the crucial lead that guided scientific tests towards the invention and eventual registration of an international family of patents on the treatment of obesity by the South African Council for Scientific and Industrial Research (CSIR) who later licensed Phytopharm in the United Kingdom to undertake further development and commercialization of the invention. In the absence of access and benefit sharing legislation, and as a result of international media expose of the Hoodia case, CSIR and the South African San Council entered into negotiations to develop a Memorandum of Understanding, in recognition of the collective rights of the San as the owners of the indigenous knowledge on the use of Hoodia. The process included workshops that were attended by the San from Botswana and Namibia as well as experts on community development from Canada. The South African San Council was mandated by WIMSA to pursue negotiations in terms of this agreement, which were successfully concluded, and a benefit sharing agreement was signed on 24 March 2003.

The core terms of the agreement are that, the San people will, in the continued success of the product, receive the following (Chennels, 2003):

- * 8% of all milestone payments received by CSIR during the development stages of the project;
- and,
- * 6% of all royalty payments to be received by CSIR as a result of commercial sales of the anti-obesity product based on Hoodia, for the duration of the patents.



The case surrounding the Hoodia succulent Hoodia gordinii, offers some hope for Regulating access of the region's biological Resources to outside parties.

A regionally coordinated and rationalized approach to the development of *sui generis* legislation in the SADC region will therefore prevent unnecessary competition among Member States, as outsiders will not be able to move from one country to another in pursuit of more favourable access conditions. It is also worth noting that cross border cooperation, investment and trade will create new patterns of resource ownership that will place new and additional demands on national institutions in terms of administration and policy analysis that go beyond project implementation. Consequently, there is need for capacity building in such areas. The Global Environment Facility (GEF), through the Capacity Development Initiative, is supporting a number of assessments of regional and national capacity needs. Such efforts should be strengthened and broadened.

2.2.6 Limited and unsustainable funding for implementing biodiversity programmes.

National government financial allocations to natural resource conservation in the region have continued to decline in real terms. The situation is more critical for certain aspects of biodiversity such as the enforcement of relevant legislation, awareness campaigns and capacity building at various levels. This is, in part, due to insufficient awareness and understanding of biodiversity issues and their implications by policy makers. The position has been worsened by the general decline in development partner support in the field of natural resources and the technical difficulties associated with accessing funding from financing windows such as GEF and the Clean Development Mechanism under the Kyoto protocol. The latter can be partly attributed to inadequate national capacity to prepare sound project proposals. The net result of the funding constraint is the reduced capacity of Member States to conserve and sustainably manage biological resources. At the regional level, financial constraints limit the ability of national agencies to implement trans-boundary programmes. Given such a scenario, Member States should commit more funds to biodiversity issues and develop and implement innovative financing mechanisms.

2.2.7 Inadequate research and development approaches for implementing biodiversity programmes.

Throughout southern Africa, expenditure on research and technology development is way below 1% of the GDP. In addition, very few to no incentives are offered to the private sector to encourage it to invest in R & D. Furthermore, most development models in the region have considered biological resources as a source of sustenance and not as a source of wealth. The foregoing scenario largely explains the limited R & D attention that has gone into areas such as value addition, bio- prospecting,

policy and institutional analysis, appropriate development models and targeted research into emerging issues such as the wildlife, livestock and human interphase under TBNRM. The latter is elaborated in Box 9.

Bio-prospecting (the examination of biological resources such as plants, animals and micro-organisms, for genetic traits that may be of value for commercial development) offers opportunities for enhancing the economic value of biological resources of the region. However, there has been very little investment in R&D in this area, other than through the Bio-prospecting Programme at the Council for Scientific and Industrial Research (CSIR) in South Africa. This Programme, established in 1990, undertakes bio-prospecting funded through the on-going investment by the South African government in strategic research at CSIR. A recent development of note is that the Namibian government, through the Ministry of Agriculture, Water and Rural Development, signed a Memorandum of Agreement with CSIR to access the bio-prospecting R&D expertise of the organization with the aim of creating economic opportunities for Namibia based on its indigenous plants.

Box 9: The wildlife, livestock and human interface under TBNRM (Cumming & WCS AHEAD, 2004)

Animal health issues, coupled with very high expectations for development benefits from wildlife-based tourism under TBNRM provide a unique opportunity for targeted interdisciplinary research to contribute to these expectations. This development, over such a large landscape, also provides an exceptional opportunity to conduct research at the interface between wildlife, livestock, human communities and varied social-ecological systems in terms of health and the provision of ecosystem goods and services; and in so doing to work towards sustainable improvements in human health and livelihoods from local to regional scales. Furthermore, there is an opportunity to establish a framework that fosters a synergistic partnership between farmers, natural resource managers and researchers on one hand, and government and non-governmental agencies involved in animal and human disease control, conservation, agriculture and rural development on the other.

Given the high costs and level of expertise needed in R & D efforts, there is need for partnerships with local, regional and international NGOs, the private sector and international cooperating partners.

2.2.8 Limited attention to the management of Genetically Modified Organisms and Invasive Alien Species

Genetically Modified Organisms and Invasive Alien Species have assumed greater significance in discussions and work programmes of the Conference of Parties to the CBD. They are also emerging as important current and potential constraints to biodiversity conservation and its sustainable use in southern Africa. It is against this background that the limited attention given to their management is considered a high priority constraint in the region.

a) Genetically Modified Organisms

Among the impacts of economic liberalization; the quest for high agricultural productivity; and recurrent droughts in southern Africa, has been an increase in the imports of Genetically Modified Organisms (GMOs), which are products of biotechnology. GMOs have the capacity to boost the

world's food supply in the face of increasing human populations, especially in developing countries. Within the region, GMOs have mostly come in the form of food aid and improved plant germplasm.

Like any other technology, GMOs can adversely affect local plant germplasm, human health and the environment if not properly handled. Consequently, security measures have to be designed to minimize the risk involved in the transfer, management, use and liberation of GMOs for sustainability reasons. Such measures are referred to as "biosafety". Unfortunately, only seven of the thirteen SADC Member States have signed the Cartagena Protocol on Biosafety and five have acceded to it. This protocol regulates the way and conditions under which GMOs can cross national borders. It would therefore be to SADC's advantage if all its Member States signed the protocol.

SADC has no policy on dealing with GMOs but it has developed guidelines on the subject (Box 10). For example, during the 2002-3 drought, the region imported some GM maize to offset part of its food deficit of 3.3 million metric tonnes. While some Member States rejected the grain on grounds that they lacked a national policy framework to deal with GMOs, others received it and fed their hungry citizens. This lack of a coherent regional policy framework on GMO imports could have long-term implications on SADC's maize germplasm that could have been polluted by the imports. Furthermore, SADC citizens were not adequately educated on the potential adverse effects of the GM food on human health to enable them decide on whether or not to consume the grain. Consequently, there is need for national and regional policy frameworks and awareness strategies on GMOs. It is therefore interesting to note that some Member States have or are in the process of developing legislation on biosafety.

Box 10: SADC Guidelines on GMOs

In 2003, SADC developed guidelines on GMOs, biotechnology and biosafety. They cover the following areas: handling of food aid, policy and regulations, capacity building and public awareness and participation. The guidelines urge Member States to develop national biotechnology policies and strategies and to sign and ratify the Cartagena Protocol. In addition, they encourage the region to develop a harmonized policy and regulatory framework based on the African Model Law on Biosafety, the Cartagena Protocol and other relevant international processes.

b) Invasive Alien Species

Invasive Alien Species (IAS) are species introduced deliberately or unintentionally outside their natural habitats where they have the ability to establish themselves, invade, out-compete natives and take over the new environments (IUCN, 2000). The globalization of markets and increases in global trade, travel and tourism are conveying more species from and to all parts of the world. This has enhanced chances of bio-invasions across ecosystems with economic costs to agriculture, forestry, fisheries and other economic sectors as well as on human health and general welfare. Some of these costs include direct costs of prevention, control and mitigation. Apart from reducing biodiversity, IAS threaten the integrity of ecosystems (Box 11).

Box 11: IAS threaten the integrity of ecosystems

The invasion of some of the region's water bodies by the water hyacinth has modified fish habitats as the weed changes and degrades aquatic water systems, outgrows local water plants and takes over. When massive quantities of the plant die, they sink to the

bottom and their decomposition deoxygenates the water resulting in the death of fish. Their debris also affects drainage systems and watercourses. Furthermore, the weed's dominant cover absorbs sunlight thereby seriously affecting the biodiversity of fauna and flora beneath the water level. The water hyacinth is a major problem in Malawi, South Africa, Tanzania, Zambia and Zimbabwe. Other important waterweeds in the region include *Salvinia molesta*, *Pistia stratiotes* and *Azolla filiculoides*.

Notwithstanding the foregoing, there is limited to no information on the extent and impact of most IAS in the region, which also include invasive pathogens such as bovine tuberculosis, for example. Furthermore, there has been no comprehensive and coordinated strategy on the prevention, eradication and control of invasives. At the national level, the enforcement of legislation that deals with IAS has been rather weak and uncoordinated. This has contributed to the unchecked proliferation of IAS.

It is also worth noting that citizens of the region have not been adequately educated on the presence and adverse effects of IAS for them to effectively participate in their prevention and control. Furthermore, there has been very little effort to turn the IAS problem into an economic opportunity. This is against a background that the majority of species used for economic benefit in agriculture, forestry and fisheries are alien to the region. Unfortunately, the utility value of IAS found in southern Africa remains largely unexplored and unresearched.



Invasive Alien Species are the single greatest threat to aquatic ecosystems in Southern Africa

3.0 Regional Biodiversity Strategy

The Regional Biodiversity Strategy is presented in the form of a matrix that highlights strategies to address the eight priority regional constraints and the focal areas (sets of activities) for specific project development. No attempt is made to develop an action plan. Rather, steps that move the Regional Strategy into the implementation mode in terms of specific project proposal development and financial resource mobilization are presented. This provides the required flexibility in its implementation given the complexity and crosscutting nature of biodiversity issues and the wide range of stakeholders involved.

3.1 Scope

The Regional Strategy consists of the following three broad strategic areas:

First, enhancing the region's economic and business base by adding value to and commercializing its biological resources; and broadening and diversifying its industrial and manufacturing base (Box 12). This is in recognition of the fact that business creates wealth and wealth fights poverty. Economic diversification will be achieved by seeking and establishing "green markets" for value added biodiversity products. The "Biotrade" will be tackled within the context of existing regulations and agreements that govern international trade in biological products. This development will be linked to certification in order to guard against the unsustainable harvesting and exploitation of the resource.



Among the broad strategic areas of the Regional Biodiversity Strategy is the enhancement of the region's economic and business base by adding value to and commercializing its biological resources.

Box 12: Broadening and diversifying the region's industrial and manufacturing base.

The need to explore other livelihood opportunities and to refocus national policy development models beyond the primary sectors of production in the region cannot be over-emphasized. In fact, this is the development route that was followed by the currently developed nations. This highlights the fact that natural resources alone are not a panacea to the region's development problems. However, it is worth noting that the issue of alternative livelihoods goes beyond the scope of this Regional Biodiversity Strategy. Rather, it should be pursued as a cross cutting issue throughout SADC economies.



The need to explore other livelihood opportunities and to refocus national policy development models beyond the primary sectors of production such as agriculture in the region cannot be overemphasized.

Second, ensuring that economic opportunities that emerge from “biotrade” and economic diversification do not lead to the unsustainable use of the region’s biodiversity and result in the loss of biological resources and ecological processes. This will be achieved through regular resource inventories and monitoring; broadening the resource base; establishing effective institutional and legal frameworks; and promoting Access and Benefit Sharing (ABS) principles. The latter will include the formulation of a *sui generis* legislation that protects local knowledge and germplasm from biopiracy. Other important areas include the development of a regional biodiversity policy and protocol; and the promotion of mutually beneficial partnership models between local communities, governments and the private sector. The models will be promoted within the context of CBNRM and TBNRM initiatives in protected and non-protected areas. All development projects will be encouraged to implement mitigatory measures contained in their Environmental Impact Assessment (EIA) reports. This will go some way in mainstreaming biodiversity into the economic and development activities of the region. In addition, a Regional State of Biodiversity report will also be produced every ten years to assess biodiversity trends.

Third, developing and implementing biodiversity awareness, information and capacity building programmes; research and development initiatives; and sustainable financing arrangements. This will underpin the economic and sustainable use thrusts of the Strategy. Establishing expert networks and Lead Institutions or Centres of Excellence in specified areas; estimating the economic values of various biodiversity products and services; establishing and/or strengthening existing databases; and appropriately packaging and disseminating biodiversity information will achieve the awareness, information and capacity building aspects of the Regional Strategy. R&D work will focus on technologies that increase the size and productivity of biological resources; on generating value addition and processing technologies; and on bio-prospecting. With respect to funding, emphasis will be on developing and promoting ‘best practices’ on innovative financing and on mainstreaming biodiversity into sector projects and programmes at national and regional levels.



Among the broad strategic areas of the Regional Biodiversity Strategy is the development & implementation of biodiversity awareness, information & capacity building programmes.

Box 13 and Table 2 present the 50 focal areas (sets of activities) of the Regional Biodiversity Strategy. They explicitly address each of the eight priority constraints to biodiversity conservation and its sustainable use in southern Africa. Although R & D is treated as an independent constraint in Table 2, it cuts across most of the other constraints addressed by the Regional Strategy. In addition, a number of focal areas apply to more than one regional constraint (see Box 13).

Box 13: Cross cutting focal areas of the Regional Strategy

Focal areas that apply to a number of regional constraints include the following:

- i) Create and/or strengthen databases on selected biodiversity components at regional and national levels and establish linkages between them.
- ii) Establish and strengthen regional Lead Institutions or Centres of Excellence that offer education and training on specific aspects of biodiversity to targeted stakeholders.
- iii) Develop the human and infrastructural capacity to inventory/collate, monitor and store biodiversity information at various levels. In addition, use this information to generate knowledge for dissemination to decision makers and other key stakeholders.
- iv) Establish regional and national rosters of experts in specific areas of biodiversity and facilitate their interaction.
- v) Conduct training and staff needs assessments on key components and areas of biodiversity and develop and implement appropriate capacity enhancement programmes.
- vi) Create a conducive environment for public-private sector partnerships.

Table 2: Constraint-based Regional Biodiversity Strategy: overview of strategies and focal areas.

Constraint	Strategy	Focal area
<p>1. Increased pressure and demand on biodiversity and agricultural land due to limited alternative livelihoods outside agriculture and natural resource exploitation.</p>	<p>a) Facilitate the development and implementation of affordable, viable and acceptable alternatives for economic development and human survival.</p>	<p>i) Facilitate technological advancement in agriculture and accelerate the commercialization of smallholder agriculture. ii) Build capacity (including technological capacity) and provide incentives for the development of small-scale enterprises to add value “at source”. iii) Develop and promote affordable and accessible alternative energy sources. vi) Broaden the forest, fish and wildlife resource base to meet increasing demands.</p>
<p>2. Inadequate biodiversity inventory and monitoring systems, and knowledge on and ability to handle biodiversity information.</p>	<p>a) Develop and implement comprehensive but simple biodiversity inventory and monitoring programmes covering key species of flora, fauna and habitats; and skills to handle and package the information, leading to improved knowledge and better management of biodiversity.</p>	<p>i) Review and harmonize current biodiversity inventory and monitoring methods to accommodate trans-boundary initiatives, including coastal and marine ecosystems and wetlands. ii) Incorporate indigenous knowledge into biodiversity inventory and monitoring systems at local level, taking cognizance of transition matrices to develop larger frameworks. iii) Undertake regular inventories and monitor key biodiversity components at species and ecosystems levels using a regionally agreed framework. iv) Ensure the implementation of mitigatory measures contained in Environmental Impact Assessment (EIA) reports for trans-boundary development initiatives, coastal and marine ecosystems, wetlands and large national projects. This will contribute towards mainstreaming biodiversity into the key economic and development sectors. v) Develop and/or strengthen regional and national capacities to conduct EIAs. vi) Promote and strengthen the <i>ex situ</i> conservation of threatened species at national and regional levels and link it to <i>in situ</i> conservation efforts at the</p>

		<p>appropriate levels (e.g. on farms and in protected areas, including marine parks).</p> <p>vii) Produce a Regional State of Biodiversity Report once every ten years. The report should have a clear and articulated account of what is good or acceptable according to agreed standards, and indicate what and by when it should be ameliorated, where possible.</p> <p>viii) Incorporate data on biological diversity within the framework of an Integrated Land Use Assessment that links data sets on demography, socio-economic conditions and agriculture.</p>
<p>3. Inadequate incentives for biodiversity conservation and its sustainable use.</p>	<p>a) Enhance the economic value of biological resources and develop mechanisms to equitably share resultant benefits.</p>	<p>i) Add value and commercialize various biological resources and facilitate public-private sector partnerships.</p> <p>ii) Develop and promote cottage industries for commercialized biological resources</p> <p>iii) Invest in value addition and processing technology.</p> <p>iv) Develop appropriate legal and institutional frameworks for equitably sharing benefits from genetic resources, including the protection and promotion of indigenous knowledge systems through <i>sui generis</i> type legislation.</p> <p>v) Develop and implement appropriate partnership and marketing models and Access and Benefit Sharing (ABS) principles for biodiversity components in protected and non-protected areas (e.g. "important bird areas" for threatened bird species).</p> <p>vi) Establish "best practices" on selected aspects of ABS and develop regional guidelines and/or protocols.</p> <p>vii) Provide market intelligence for various community level biological products and protect community rights and indigenous knowledge.</p>

<p>4. Low levels of awareness, knowledge and appreciation, including the value of biological resources, at various levels.</p>	<p>a) Enhance awareness, information and knowledge on biological resources at various stakeholder levels.</p>	<p>i) Conduct economic valuation studies for various biodiversity products and services (i.e. measuring the costs and benefits of actions that affect biodiversity) and explore opportunities to enhance their contribution. ii) Appropriately package and disseminate information on various biological resources and emerging issues to targeted stakeholders using various channels, including the print and electronic media.</p>
<p>5. Weak institutional and legal frameworks for implementing biodiversity initiatives.</p>	<p>a) Strengthen institutional and legal frameworks for implementing biodiversity initiatives.</p>	<p>i) Review existing institutional and legal frameworks on selected biodiversity components and develop regional guidelines and protocols on “best practices”. ii) Enhance the capacity of Member States to enforce relevant pieces of legislation at local, national and regional levels; and promote incentive based regulations such as the certification of “Bio products”. iii) Formulate and operationalize a regional biodiversity policy and protocol. iv) Facilitate the development of national consensus, policies and capabilities on trans- boundary initiatives, including a policy framework on plant and animal health in Trans-frontier Conservation Areas (TFCAs).</p>
<p>6. Limited and unsustainable funding for implementing biodiversity programmes.</p>	<p>a) Provide a sustainable and readily accessible financial base to support biodiversity programmes.</p>	<p>i) Review existing innovative financing mechanisms for biodiversity initiatives in Member States and beyond and formulate regional guidelines on “best practices”. ii) Mainstream biodiversity into sector policies, programmes and projects at national and regional levels. iii) Establish Trust Funds to support specific biodiversity projects at national and regional levels. iv) Improve the capacity of Member States to access funds from existing multilateral environment agreements such as the CBD, UNCCD and the UNFCCC.</p>

<p>7. Inadequate R&D approaches for implementing biodiversity initiatives.</p>	<p>a) Develop appropriate R&D approaches for implementing biodiversity initiatives.</p>	<p>i) Evaluate and improve upon existing approaches and develop and test new models on TBNRM and CBNRM initiatives and on ABS and IAS under protected and non-protected areas. ii) Conduct research on increasing the size and productivity of selected biological resources. iii) Conduct multi-disciplinary research on plant and animal health in TFCAs, including linkages with human health and livelihoods. iv) Invest in domestication and production technologies of key species such as medicinal plants and indigenous fruit trees. v) Conduct research on trade-offs between conservation and livelihoods in protected areas, and provide guidelines on the optimal extent and scale of protected areas under different conditions, such as key natural ecosystems. vi) Undertake R&D in bio-prospecting.</p>
<p>8. Limited attention to the management of Genetically Modified Organisms (GMOs) and Invasive Alien Species (IAS)</p>	<p>a) Improve the region's capacity to manage GMOs</p> <p>b) Improve the region's capacity to prevent, eradicate and control IAS.</p> <p>c) Improve the regions capacity to manage IAS and GMOs</p>	<p>i) Develop national and regional policy and legislative frameworks for dealing with GMOs. ii) Build national and regional capacities to handle GMO related issues including, human health.</p> <p>.</p> <p>i) Identify and map out the geographical spread of problematic IAS in the region. ii) Explore possibilities of turning the IAS problem into an economic opportunity. iii) Evaluate the synergistic effects of land degradation and climate change on the spread of IAS.</p> <p>i) Establish the actual impact of IAS/GMOs on other biodiversity and economic activities. ii) Conduct studies to establish “best practices” in the management of IAS/GMOs and promote them. iii) Develop regional guidelines and/or protocols on the management and</p>

		monitoring of IAS/GMOs. iv) Collate and disseminate information on GM foods and on IAS to various stakeholders.
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The 50 focal areas cut across the traditional biodiversity sectors of forestry, wildlife, aquatic life and agriculture. They also address key challenges identified in the RISDP, the NEPAD Environmental Action Plan and the MDGs and have the following attributes:

- A number of them (e.g. resource inventories, monitoring and environmental impact assessments) have a largely national focus. However, they provide useful building blocks for regional actions;
- Some of them are being addressed by on-going regional initiatives. For such focal areas, emphasis will be on creating synergies (through joint ventures) or just strengthening current initiatives during the Regional Strategy’s project proposal development phase. For example, a considerable amount of work is being carried out on TFCAs with support from regional NGOs and international cooperating partners. Such work should be considered as an important entry point, especially since poverty and HIV/AIDS prevalence maps in the region show high rates in communities around protected areas (Dikobe personal com.); and,
- Most of them impact on a number of international conventions to which SADC Member States are party. Consequently, the development and implementation of specific projects emanating from them present practical opportunities for facilitating linkages across relevant multilateral environment agreements in the region.

3.3 Implementation framework

3.3.1 Policy and institutional issues

The Regional Biodiversity Strategy comes at a time when SADC and its Member States have no clear underlying policy framework on biodiversity issues. It will therefore be implemented under the auspices of NBSAPs and other relevant national planning frameworks in the Member States.

At the regional level, it will be anchored on the following:

- Policy interventions for “Sustainable Food Security” and “Environment and Sustainable Development” as articulated in the RISDP. Entry points into these interventions will become clearer once a regional biodiversity policy and protocol have been developed as envisaged in the Regional Strategy. In addition, the Regional Strategy will feed into the NEPAD Sub-regional Environment Action Plan for southern Africa, currently under formulation.
- Regional protocols such as those on forestry, wildlife, fisheries, energy, trade, shared watercourse systems, health and education and training. These legal instruments contain elements of biodiversity.

Institutionally, the Regional Strategy will operate within the framework of existing SADC structures (Box 14). At the regional level, it will be coordinated under the umbrella of the SADC Secretariat through the Food, Agriculture and Natural Resources (FANR) Directorate. Among other units, the directorate houses the agriculture, forestry, wildlife and aquatic life sectors. These sectors will provide coordination and facilitation oversight to resultant regional projects that fall under them. At national level, linkages will be established between the Regional Strategy and relevant biodiversity sectors (viz. forestry, wildlife, aquatic life and agriculture). These sectors and their partners will be responsible for implementing projects that emanate from the Regional Strategy. Given that the Regional Strategy was derived from constraints contained in NBSAPs, such an arrangement will complement rather than compete with related national initiatives. Furthermore, the use of existing national and regional institutional arrangements will ensure the speedy implementation of the resultant projects. Notwithstanding, some of these institutions might need some strengthening, depending on the project and the implementing sector. It is, however, worth noting that the sector approach does not capture cross sector synergies and contradictions, as is the case with an ecosystems approach. Unfortunately, the latter is still evolving in the region and no appropriate institutional frameworks currently exist for its implementation.

Box 14: The evolution and structure of the SADC Secretariat

The SADC Secretariat has been undergoing institutional and programmatic restructuring since 2002. This resulted in the centralization of the 21 Sector Coordinating Units that were formerly located in the coordinating Member States. Four directorates namely Food, Agriculture and Natural Resources (FANR); Trade, Investment and Finance; Infrastructure and Services; and Human Resources and Special Programmes were created to accommodate the sectors. Biodiversity falls under the Environment sector/unit of the FANR directorate.

SADC National Committees (SNCs) will provide the link between the SADC Secretariat and the relevant national sectors during project implementation. They will be responsible for disseminating information on the Regional Strategy and its resultant projects as well as their implementation and monitoring within Member States. In addition, SNCs will ensure the broad and inclusive participation of key stakeholders at that level.

Regarding the implementation of approved and funded projects generated from the Regional Strategy, SADC will engage Executing Agents. The Agent will be responsible for the day-to-day operational management and supervision of the project through the relevant implementing sector at national level. Essential characteristics of an Executing Agent include: in-depth technical know how in the particular area; demonstrated programme management capabilities; and general acceptability by Member States, cooperating partners and other key stakeholders.

Operationally, the Agent will receive policy and technical oversight from a Programme Steering Committee. The committee will consist of representatives of Member States, the SADC Secretariat, international cooperating partners and other relevant stakeholders as necessary.

3.3.2 Implementation modalities

The operationalization of the 50 focal areas of the Regional Biodiversity Strategy will depend on the availability of both internal and external funding hence the interests of the funding sources will influence their sequencing. The following activities will be undertaken in implementing the Regional Biodiversity Strategy:

First, SADC will extensively and continuously market the Regional Strategy to various stakeholders and partners.

Second, SADC will continuously encourage local, regional and international NGOs and private sector entities to, independently or jointly with it, mobilize resources for implementing new or strengthening existing projects in their preferred focal areas.

Third, the SADC Secretariat and partners will develop concept notes and detailed project proposals within the focal areas, taking cognizance of on-going initiatives. To achieve this, the Secretariat will, individually or collectively with its development partners, consider the creation of a short-term position of a Biodiversity Projects Coordinator. This is in recognition of the small personnel establishment within the Secretariat and the need to complement it in order to “jump start” the implementation of the Regional Strategy. The Coordinator will lead the project proposal development process and mobilize financial resources. The resultant proposals will be submitted to interested development partners for consideration and possible financial support as they come on stream. This will ensure that some project work comes on stream sooner rather than later and will help to maintain the interest of Member States on the initiative.

Fourth, SADC will review the Regional Biodiversity Strategy every five years to assess the extent of its implementation and to incorporate new and emerging issues.

ANNEXES

ANNEX I: INTRODUCTION

This Annex provides a conceptual framework within which the Regional Biodiversity Strategy was crafted. It highlights that the Regional Strategy is anchored on the Regional Indicative Strategic Development Plan (RISDP), the New Partnership for Africa's Development (NEPAD) Environment Action Plan and the Millennium Development Goals (MDGs). The Annex summaries the biodiversity situation in the region and gives a justification for the Regional Biodiversity Strategy. The methodology followed in developing the Regional Strategy is then presented.

1.1 Background

The Southern African Development Community (SADC) consists of thirteen Member States located in the southern part of the African continent. They are Angola, Botswana, the Democratic Republic of Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. The Community's role has evolved from the time of political liberation in the 1970s to economic cooperation and integration in the 1990s. This evolution is reflected in its vision of "a common future for all countries and peoples of southern Africa" (Box 1.1). The vision is anchored in the determination of SADC to confront underdevelopment and marginalisation in an increasingly globalised world by jointly addressing mutual aspirations and problems. Consequently, there is considerable political will for trans-boundary cooperation in southern Africa. To operationalise this, SADC Heads of States and Governments adopted the Regional Indicative Strategic Development Plan (RISDP) in 2004. The Plan is a vehicle for achieving the Community's goals of social and economic development and poverty eradication. SADC is also committed to the ideals of the New Partnership for Africa's Development (NEPAD). NEPAD is a programme of the African Union designed to meet the development objectives of its Member States. It has identified democracy and political governance, among other things, as essential prerequisites for achieving sustainable development in Africa. One of the key principles of the RISDP and NEPAD is the need to closely link their agenda with the Millennium Development Goals (Box 1.2).

Box 1.1 The SADC Vision

"The SADC vision is one of a common future, a future in a regional community that will ensure economic well-being, improvement of standards of living and quality of life, freedom and social justice and peace and security for the peoples of southern Africa. This shared vision is anchored on the common values and principles and the historical and cultural affinities that exist between the peoples of southern Africa" (SADC, 2004).

Table 1.1 presents some key socio-economic statistics on SADC Member States. According to the table, the countries are at different stages of economic development with South Africa having the largest and dominant economy in terms of Gross Domestic Product (GDP). Economic performance in the region has remained fragile as countries continue to be exposed to natural disasters and adverse external shocks. This is partly because most of their economies are dependent on the primary sectors of production. Only South Africa and Mauritius have sizeable manufacturing sectors that account for 25% of their GDP (SADC, 2004). Furthermore, between 40% and 85% of the region's citizens live in rural areas where they depend on natural resources for survival. This underpins the overriding importance of biological resources in southern Africa.

Box 1.2 Millennium Development Goals

The Millennium Development Goals (MDGs) are an ambitious agenda for reducing poverty and improving human lives that world leaders agreed on at the Millennium Summit in September 2000. They are: eradicate extreme poverty and hunger; achieve universal primary education; promote gender equity and empower women; reduce child mortality; improve maternal health; combat HIV/AIDS, malaria and other diseases; ensure environmental sustainability; and, develop global partnerships for development. Specific targets and time frames were set for each goal.

Table 1.1 Some key socio-economic statistics on SADC Member States

Country	GDP (US\$ billion)	GDP per capita (US\$)	Population (million)	Urbanization (%)
Angola	9.76	696.9	14.0	42.4
Botswana	6.50	2 796.0	1.7	46.0
DRC	5.28	96.1	54.9	60.0
Lesotho	0.79	366.0	2.2	17.0
Malawi	2.28	198.0	11.5	15.0
Mauritius	4.83	3 953.0	1.2	43.0
Mozambique	4.09	226.0	18.1	23.0
Namibia	2.82	1 667.0	1.8	27.0
South Africa	159.90	3 452.0	46.4	56.0
Swaziland	1.22	1 109.0	1.1	22.6
Tanzania	9.74	266.0	33.6	30.0
Zambia	4.34	392.0	10.7	35.0
Zimbabwe	22.00	1 891.0	11.6	33.6

Source: Maskew Miller Longman Group & SADC Secretariat (2003) & National Statistical Yearbooks.

Over 50% of the GDP of SADC Member States comes from primary sectors of production such as agriculture, mining, forestry and wildlife. However, although the region is endowed with natural resources, it is characterized by high levels of poverty that emanate from its inability to effectively transform this natural resource capital into goods and services for social and economic development and poverty eradication. Furthermore, southern Africa is facing serious environmental challenges largely originating from increasing human population relative to resource availability; agricultural expansion coupled with declining land productivity; continued reliance on wood fuel; increasing land degradation; climate change; and continuing erosion of human capacity through HIV/AIDS.

It is against the foregoing background that the RISDP embraces the ideals of the NEPAD Environment Action Plan. The latter was crafted on the realization that Africa is the only continent where poverty is expected to rise during the twenty first century and that its reduction depends on good stewardship of the environment. The NEPAD Environment Action Plan therefore addresses major environmental issues and challenges faced by the continent as a whole (Box 1.3). The Plan will be implemented through the NEPAD Sub-regional Environment Action Plans that recognize regional differences and location specific circumstances in programme development and implementation but still subscribe to a set of agreed upon sustainable management principles.

To operationalize the biodiversity components of the RISDP and the NEPAD Environment Action Plan, SADC is developing a Regional Biodiversity Strategy. The Strategy is underpinned by the recognition that the state of the environment (which includes biodiversity) is a major determinant of the growth and development of the region and affects the living standards of its citizens. Consequently, addressing environmental issues and challenges is a necessary condition for achieving SADC's goals. The Regional Strategy will assist in enhancing or building capacity to implement trans- boundary initiatives related to biodiversity conservation and its sustainable use in southern Africa. In this regard, it will complement the NEPAD Sub-regional Environment Action Plan for southern Africa, currently under formulation.

Box 1.3 Major environmental issues and challenges in Africa (UNEP, 2003).

- √ The basic problem of persistent degradation of the environment and increasing loss of natural resources;
- √ Decreasing natural habitats and fragile ecosystems precipitating diminishing diversity of species;
- √ The exploitation of natural resources is accelerating at an unsustainable rate that is higher than the rate of replenishment and/or replacement;
- √ Land degradation as well as natural and human induced environmental disasters continue to pose a great problem to the continent and her citizens;
- √ The severity of environmental problems is a major contributor to the problem of poverty and dismal growth performance of Africa; and,
- √ There appears to be lack of appropriate recognition by the political leadership of the importance and severity of the problem of the environment, an issue that probably accounts for inadequate attention being paid to the subject matter.

1.2 Biodiversity in southern Africa

The Convention on Biological Diversity (CBD) defines biodiversity as the variation between ecosystems and habitats; the variation between different species; and the genetic variation within individual species. According to Johnson (1995) it can be thought of as a system of interactions between genes, species, and the ecosystems they form, influencing and influenced by ecological and evolutionary processes. Thus, diversity exists at three main levels: the combination of species that make up different ecosystems; the number of different species; and the different combination of genes within species. All the three levels help to sustain biological systems, as well as ensure their productivity. Biodiversity drives the economies of SADC Member States through the economic resources and ecological services it provides. Consequently, its restoration, maintenance or enhancement should not be viewed as an end in itself, but as a means to achieve the region's socio-economic development.

Southern Africa is rich in biological resources, some of which have global significance (Table 1.2). It has a large and diverse heritage of flora and fauna, including domesticated crops. They are found in the region's varied environments that include arid and semi arid ecosystems; mediterranean-type ecosystems; coastal, marine and freshwater ecosystems; and mountain ecosystems. According to Griffin *et al* (1999), the region is characterized by a high country species richness (e.g. in Angola and South Africa); and a wide range of sites of high endemism such as Lake Malawi, Succulent Karoo (Sperrgebiet/Richterseveld), Cape Floristic Region and the Maputoland/ Pondoland/Albany. Of the 82 sites globally chosen for their species richness and endemism in sub Saharan Africa, 26 fall within the SADC region. In addition, more than 40% of the species found in southern Africa are endemic. Some of these biological resources have global significance for the world's climate and for the development of agricultural and industrial activities.

Table 1.2 Species diversity in southern Africa

Country	Area (000 sq km)	Mammals	Birds	Fish	Flowering plants
Angola	1 247	275	872	268	5 000
Botswana	582	154	569	81	2 000
Lesotho	30	33	288	8	1 576
Malawi	118	190	650	1000	6 000
Mozambique	799	216	735	500	5 500
Namibia	824	154	640	97	3 159
South Africa	1 219	247	774	220	20 300
Swaziland	17	47	496	45	2 636
Tanzania	945	310	1 016	250	11 000
Zambia	753	229	732	156	4 600
Zimbabwe	390	196	634	132	6 000

Source: Cumming (1999) & National consultations.

Throughout centuries the peoples of southern Africa have depended on the region's rich biodiversity for survival. They have developed strategies to protect and conserve this natural heritage for the benefit of their own and future generations. For example, some cultures often designated areas rich in biodiversity as sacred or protected areas for a variety of reasons. However, most of these conservation sensitive traditional beliefs and customs are rapidly breaking down due to population pressures and changes in the socio-economic environment, including urbanization. The impact of such changes on biological and cultural diversity cannot be over-estimated

1.3 The Convention on Biological Diversity

The objectives of the CBD are the conservation of biodiversity; the sustainable use of its components; and the equitable sharing of benefits from the use of genetic resources. The Convention stresses the need to promote regional, and global cooperation on these issues. In addition, it requires parties to cooperate on matters of "mutual interest" related to biodiversity conservation and its sustainable use. It also establishes an international structure for continued cooperative research, technology transfer, information exchange assistance, and monitoring and assessing the implementation of the Convention. It further requires developed countries to provide financial support for the implementation of the Convention by developing countries. A funding mechanism, the Global Environment Facility (GEF) is in place and is administered by the World Bank and the United Nations Development Programme (UNDP) on behalf of donor countries.

The CBD was signed by 150 governments at the close of the United Nations Conference on Environment and Development in June 1992. As of March 2005, it had been ratified

or acceded to by 188 countries and the European Union. All SADC Member States are Parties to the Convention which requires parties to:

- Inventory national biodiversity;
- Integrate biodiversity protection into relevant policies and programmes;
- Identify and monitor activities that harm biodiversity, and protect biodiversity through a range of measures that include the creation of protected areas and the implementation of regulations and incentives aimed at ensuring its sustainable use; and,
- Develop National Biodiversity Strategies and Action Plans (NBSAPs).

The first stage in the development of a NBSAP is the preparation of a Country Study document, which presents the status of biodiversity in a country. It also evaluates the importance of biodiversity to the national economy and highlights the various threats to biodiversity and their significance. This is followed by extensive stakeholder consultations during which the NBSAP is formulated. Table 1.3 shows the status of Member States with respect to ratifying the Convention and formulating NBSAPs. According to the table, all countries have ratified the CBD and the majority have completed their NBSAPs. The latter provide useful building blocks for addressing trans-boundary biodiversity issues at the regional level.

Table 1.3 Status of Member States on aspects of the CBD

Country	Date ratified	Status of NBSAP
Angola	01 April 1998	Under preparation
Botswana	12 October 1995	Completed
Lesotho	10 January 1995	Completed
Malawi	02 February 1994	Completed
Mozambique	25 August 1995	Completed
Namibia	16 May 1997	Completed
South Africa	02 November 1995	Completed
Swaziland	09 November 1994	Completed
Zambia	28 May 1993	Completed
Zimbabwe	11 November 1994	Completed
Tanzania	08 March 1996	Completed
DRC	03 December 1994	Completed
Mauritius	04 September 1992	Completed

1.4 The need for a Regional Biodiversity Strategy

Most of the biodiversity of southern Africa transcends national boundaries. In addition, a few species of mammals, birds, butterflies and fish exhibit trans-boundary migration patterns. However, the region's biodiversity is under threat from a variety of sources that include population growth, agricultural expansion, continued reliance on wood fuel and land degradation. These threats are leading to the loss of biological resources and

ecological processes. Regional cooperation is therefore essential to effectively address such threats; maintain the integrity of ecosystems that transcend national boundaries; and ensure that natural resources continue to contribute to the socio-economic development of southern Africa. It is against this background that ten of the thirteen SADC Member States namely Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe are participating in the SADC Biodiversity Support Programme (BSP), whose implementation started in 2000. The Programme was refocused in 2003 following a Mid Term External Evaluation.

The purpose of the refocused SADC BSP is to establish and/or enhance capacity and institutional mechanisms that enable SADC Member States to collaborate in regional biodiversity conservation; to prevent or control the spread of Invasive Alien Species (IAS); and to apply Access and Benefit Sharing (ABS) principles (Timberlake *et al*, 2003). The GEF provides financial resources to the Programme. The Programme receives administrative oversight from the United Nations Development Programme (UNDP) and technical support from IUCN-the International Union for the Conservation of Nature.

One of the expected outputs of the SADC BSP is a Regional Biodiversity Strategy. The Regional Strategy will provide a framework for regional cooperation on biodiversity issues that transcend national boundaries, including IAS and ABS in all SADC Member States. However, the Strategy does not assume the individual country responsibilities under the Convention.

1.5 Methodology used.

The SADC BSP Regional Steering Committee, through a Task Force, spearheaded the development of the Regional Biodiversity Strategy. The key steps followed were: situation analysis; prioritization of constraints; and the formulation of a constraint-based Regional Strategy. There was constant forward and backward movement between the three steps to obtain stakeholder consensus and accommodate emerging issues. The rationale for adopting a constraint-based approach was that constraints (encompassing policy, institutional and technical considerations) determine what people can do, want to do and end up doing. For example, they determine the biodiversity and complementary resources that SADC citizens can individually or collectively access and use for their livelihood and development; their knowledge and skills to use such resources; and their motivations. Motivations determine the benefits and ways in which citizens utilize the knowledge, skills and resources they have or can access (Navarro, personal com.).

1.5.1 Situation analysis

Extensive literature searches were carried out. They focused on the status of biodiversity, threats to it and opportunities for its conservation and sustainable use in the region. Among the information sources used were:

- National planning frameworks including National Biodiversity Strategies and Action Plans (NBSAPs); Poverty Reduction Strategy Papers; National

Conservation Strategies; National Environment Action Plans; and State of the Environment Reports;

- Regional and Africa wide instruments such as the RISDP; Regional protocols and conservation programmes; Reports on the State of the Environment in southern Africa; and the NEPAD Environment Action Plan; and,
- Relevant international instruments and frameworks such as the CBD, Millennium Development Goals, the World Summit on Sustainable Development and the World Parks Congress.

1.5.2 Prioritization of regional constraints

The situation analysis highlighted a number of national level constraints to biodiversity conservation; its sustainable use; and equitable sharing of benefits as articulated in the NBSAPs and other relevant national planning frameworks. A regional consultative workshop was subsequently convened in Swaziland in June 2002 to prioritize cross cutting constraints to biodiversity conservation and its sustainable use in the SADC region. The following criteria were used to prioritize regional constraints:

- The ability of opportunities that emanate from the constraint to contribute towards social and economic development and poverty eradication;
- Their regional nature in terms of the number of Member States affected by them; and,
- The feasibility of implementing opportunities emerging from the constraints within a regional context. This criterion removes those constraints that, because of their nature, are better handled at national rather than at regional level. For example, decisions on the range of ecosystems that should be represented on the national protected areas and marine parks networks are largely based on country level realities than on regional and international requirements or norms.

1.5.3 Formulation of the Strategy

After identifying and prioritizing regional constraints, the Swaziland workshop proposed strategies to address them. The resultant draft Regional Biodiversity Strategy was presented at a Southern Africa Biodiversity Forum meeting held in Zambia in November 2002. This draft document went through a major restructuring and reorganization exercise between December 2004 and February 2005 in conformity with the refocused SADC BSP. The resultant draft was subjected to several reviews and consultations at national and regional levels. They included the following:

- A meeting of the Task Force of the SADC BSP's Regional Steering Committee in Swaziland in February 2005;
- An External Peer Review of the draft Strategy between February and April 2005. Some 16 technical, policy and institutional experts from government, non-governmental organizations, international NGOs, universities, the private sector and donor organizations reviewed the draft Regional Strategy;
- Country level consultations on the draft document were carried out between April and May 2005; and,

- A regional workshop to discuss and finalize the document was held in South Africa in June 2005

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ANNEX II: BIODIVERSITY SITUATION IN SOUTHERN AFRICA

In this Annex, the biodiversity situation in southern Africa is presented with emphasis on its status; threats to its conservation and sustainable use; and the region's response. An attempt is made to balance the analysis in such a way that it contains sufficient information to guide the Regional Biodiversity Strategy preparation process but is not too detailed to bog down the various target audience of the document that include policy makers, researchers, academics and the public. The assessment was, however, constrained by the lack of up to date and consistent statistics on biodiversity issues in the region.

2.1 Status of biodiversity in the SADC region

For purposes of assessing the status of biodiversity in southern Africa, the ecosystems and sector approaches were considered.

Southern Africa supports a wide range of ecosystems that can be categorized by different features. One way of recognizing ecosystems is based on biomes or different vegetation types. These include different forest types, grasslands, savannas, deserts and the unique fynbos found on the southern tip of Africa. Ecosystems can also be based on physical or geographical boundaries such as mountains, rivers and wetlands. An ecosystem is bound together by a unique set of ecological processes that shape ecological communities within it. The manipulation of these processes can be used to manage ecosystems. The ecosystems approach is therefore a strategy for the integrated management of land, water and biological resources for their conservation and sustainable use.

Despite its inability to capture synergies and contradictions across sectors, the sector approach was adopted in the biodiversity situation analysis and in developing the Regional Biodiversity Strategy. Reasons for this were that:

- Member States and indeed SADC itself are structured along sectoral lines. Consequently, policies and programmes that affect biodiversity in the region are formulated and implemented within a sector context. The sector approach therefore ensures that projects emerging from the Regional Strategy are implemented within existing institutional frameworks;
- The contribution of natural resources to the Gross Domestic Product (GDP) of SADC Member States is captured along sectoral lines;
- The sector approach entices and brings on board the biodiversity constituency that is largely divided on sectoral lines; and,
- The ecosystems approach, as it relates to biodiversity and general programming in the region, is still evolving. Furthermore, it still has to find an institutional home within the existing planning and implementation frameworks.

The key biodiversity sectors identified were forestry, wildlife, aquatic life and agriculture. These primary sectors of production contribute significantly to the socio-economic development of southern Africa as most countries still have relatively small manufacturing sectors. Despite their undoubted importance as providers of ecological

services, microorganisms as well as fungi and small non-charismatic invertebrates are not included in the analysis. This is largely because the region has no adequate human, institutional and financial capabilities to handle them at this stage (Timberlake, personal com).

This section highlights the role of the four sectors in the economies of SADC Member States and their biodiversity status.

2.1.1 Forest biodiversity

a) Role of forest biodiversity

Closed forests consist of trees, the crowns of which limit sunlight penetration to the ground and discourage ground undergrowth. Open woodlands, on the other hand, comprise trees and grasses that grow together. The proportions of the two components vary with rainfall, soil type and other physical factors. In this document, forests are considered to have a canopy cover of above 80% while woodlands have a canopy cover of between 10% and 80% (ADB/EU/FAO, 2003).

The forestry sector contributes less than 3% to the GDP of most countries in southern Africa. The contribution largely comes from exotic timber plantations and commercial indigenous timber. However, the figure grossly misrepresents the contribution of forests and woodlands to the region's economy as the bulk of their products and services are not captured in national level statistics. For example, the World Bank estimates that forest based products such as wild foods, wood, medicinal plants, grass, reeds, honey and leaves contribute over 35% of average rural incomes in some parts of Zimbabwe. Furthermore, about 20% of the daily needs of some rural communities come from forests and woodlands.

Important products and services derived from forests and woodlands include: industrial timber and timber products; fuel wood, non- timber forest products; and environmental services. The latter include the provision of clean water, climate regulation, soil and biodiversity conservation, watershed protection, carbon sequestration and nutrient recycling. Furthermore, forests and woodlands are important culturally, as sacred and burial sites. With respect to carbon sequestration, southern Africa's vast forest resources, especially in the miombo and similar woodlands, are significant sinks for carbon dioxide and thus have a potential role in alleviating and balancing emissions from industrialized countries. Unfortunately, it is predicted that Africa will suffer the most, as its economies are more sensitive to climate change. The foregoing underscores the need to maintain as much forest cover as possible, recognizing other economic activities that compete with forestry.

b) Status of forest biodiversity

According to SARDC/IUCN/SADC (in press), forest and woodland types of southern Africa can be summarized as follows:

i) *Tropical forests*. These are found in parts of Angola and the Congo basin. They harbour a diverse assemblage of plants and animals with about 400 mammal species, more than 1 000 bird species and over 10 000 plant species of which some 3 000 are endemic to the region.

ii) *Afromontane forests*. They are found in the high altitude and high rainfall areas of Malawi, Mozambique, Tanzania, Zambia, Zimbabwe and South Africa. The tree species, that include *Podocarpus*, are similar to those found in tropical rainforests. However, one of the few differences with the latter is the occurrence of tree ferns and conifers.

iii) *Mangrove forests*. These are found along the coastline of Mozambique and Angola and the north east coast of South Africa. Tanzania, Namibia and Mauritius also have some Mangrove forests. These forests play a very important protective function to the coastline and are also key ecosystems for the breeding of marine fisheries.

iv) *Zambezi teak forests*. They are sometimes called the “Kalahari forests”. They occur in parts of Zimbabwe, Zambia, Botswana, Namibia and Angola. The dominant tree species is *Baikaea plurijuga*. This forest type has a long history of management for commercial timber exploitation, wildlife utilization, cattle grazing and water catchment.

v) *Miombo woodlands*. They are the most extensive woody vegetation type in areas north of the Limpopo river. Dominant tree species are *Brachystegia*, *Julbenardia* and *Isobertinia*. Thickets of miombo hold little merchantable timber using current technologies and market preferences. Some of the woodlands, especially in Zimbabwe, Malawi and Tanzania, have been converted into intensive agricultural areas hence it is difficult to locate pristine woodlands in these countries.

vi) *Mopane woodlands*. They are found in the drier and lower lying parts of Zimbabwe, Zambia, Namibia, Angola, Botswana, South Africa, Mozambique and Malawi. Where *Colophospermum mopane* is dominant, the woodland assumes economic importance especially as a source of browse for both domestic and wild animals. In addition, the tree’s coppicing abilities render the woodlands economically important for subsistence wood fuel, construction poles and mopane worms.

Forests and woodlands of the SADC region cover some 39% of the total land area. This ranges from 0.5% in Lesotho to 56% in Angola. Between 1990 and 2000, the region’s indigenous forests were being lost at an average rate of 0.6% per annum. The figure ranged from 0.1% in South Africa to 2.2% in Malawi. On the other hand, Swaziland recorded a growth in forest cover of 1.3% over the same period partly due to extensive exotic timber plantations that the country has established (Table 2.1).

At the species level, there has been a marked decrease in the abundance of certain plants due to various human induced pressures. For example, the over- reliance on traditional medicinal plants for primary health care by the majority of the region’s citizens has contributed to the over -exploitation of species such as *Walburgia salutaris* in Swaziland

and Zimbabwe; and *Albizia brevifolia* in Namibia. Similarly, the commercialization of crafts like baskets and wood curios has led to a decline in tree species such as *Berchemia discolor* which is used as a palm leaf fibre dye in Botswana and Namibia. There has also been over-harvesting of *Azelia quanzensis* and *Pterocarpus angolensis* in a number of countries in response to the flourishing woodcraft industry. The proportion of threatened plant species in the region ranges from 0.5% in Angola to 40% in Swaziland (Prescott-Allen, 2001). Member States have established national seed banks, botanic gardens, museums, herbaria and zoological gardens for the *ex situ* conservation of selected forest genetic resources in response to the foregoing threats.

Table 2.1 Forest cover loss in southern Africa: 1990-2000

Country	Forest cover in 1990 (000ha)	Forest cover in 2000 (000ha)	Annual change (%)
Angola	70 998	69 756	-0.2
Botswana	13 611	12 427	-0.9
DRC	140 531	135 207	-0.4
Lesotho	14	14	NS
Malawi	3 269	2 562	-2.2
Mozambique	31 238	30 601	-0.2
Namibia	8 774	8 040	-0.8
South Africa	8 997	8 917	-0.1
Swaziland	464	522	+1.3
Tanzania	39 724	38 811	-0.2
Zambia	39 755	31 246	-2.1
Zimbabwe	22 239	19 040	-1.4
Total	379 614	357 143	-0.6

Source: FAO (2001).

Of the total forested area in the region, 2.5 million ha or 0.7% is under exotic timber plantations. South Africa has the largest area of exotic plantations, followed by Swaziland, Zimbabwe, Tanzania, Angola and Malawi in that order. Plantations have been established to reduce pressure on natural/indigenous forests for various products and services. However, because of their fast growth rates, exotic timber species such as eucalypts, pines and wattles take up more water than indigenous tree species. This disrupts microclimates and hydrological cycles of the affected areas and downstream. Consequently, the issue of their high use of scarce water resources will continue to dominate future debates on whether or not to expand exotic timber plantations in southern Africa. Furthermore, some of the exotic timber species have become invasive and are adversely impacting on indigenous vegetation and other biodiversity in ways that are only now starting to become clear. This is expected to drastically increase in severity under climate change (Masters *et al*, 2004).

There is a growing importance of “trees outside forests” in southern Africa. The trees are established on homesteads, in mixed agricultural systems and on degraded communal lands. Apart from enhancing the forest resource base, the trees increase biodiversity as they consist of both indigenous and exotic species. Tree planting has been quite successful in a number of SADC Member States and in other parts of the continent. In fact, the winning of the 2004 Nobel Peace Prize by a Kenyan national was in recognition of tree planting and “Re- greening efforts” taking place in Kenya in particular and Africa in general. However, a major constraint to tree planting in southern Africa has been low tree survival rates caused by inadequate moisture; ecological factors such as the absence of mycorrhizal fungi; termite and livestock damage; and insecure land tenure arrangements in the case of communal land.

2.1.2 Terrestrial wildlife biodiversity

a) Role of terrestrial wildlife biodiversity

Wildlife consists of living terrestrial organisms that occur naturally in the wild. However, this section focuses on large mammals because of their economic importance. Wild plants are covered under forest biodiversity. Large wild mammals are a unique economic resource in the sense that they make better use of vegetation compared to livestock and have many marketable uses in addition to meat production (SARDC/IUCN/SADC, in press). They are also used for both consumptive and non-consumptive tourism purposes.

Wildlife based tourism brings millions of dollars in foreign currency into the SADC region. In fact, this activity ranks among the top three contributors to the GDP of most countries of southern Africa. For example, tourism based receipts were US\$4 625 million, US\$4 717 million and US\$4 989 million in 1997, 1998 and 1999 respectively (SADC, 2001). The major activities include game and trophy hunting; and game viewing. In addition, local communities hunt wildlife mainly for subsistence requirements.

b) Status of terrestrial wildlife biodiversity

The region’s terrestrial wildlife resources are varied and abundant. They consist of hundreds or thousands of species of birds, plants, mammals, reptiles, butterflies, amphibians and invertebrates. The concentration of large mammal species is spectacular. For example, southern Africa supports between 200 000 to 250 000 elephants. Leopard, buffalo, kudu, zebra and other antelopes also occur in large numbers (SARDC/IUCN/SADC, in press). On the other hand, although cheetah and rhino are present in small numbers, the region has a high proportion of the world’s population of both species.

Notwithstanding the foregoing, terrestrial wildlife resources of the region are under tremendous pressure from a variety of sources that include habitat loss and poaching. There has, therefore, been a general decrease in the populations of most economically important large mammal species such as rhino, buffalo, antelope and lion. On the other hand, populations of a few species such as elephants have increased or stabilized,

possibly in partial response to trade restrictions imposed by the Convention on International Trade in Endangered Species (CITES) and the manipulation of water points in protected areas (Kojwang, personal com).

The proportion of threatened wild mammal species in the region ranges from 2.6% in Zimbabwe to 13% in South Africa (Prescott-Allen, 2001). However, the figures are on the increase in SADC as a whole (SARDC/IUCN/SADC in press). In terms of species extinction, the blue antelope and the quagga are the only mammalian species known to have become extinct in southern Africa in recent times (Groombridge, 1993; Monadjem, personal com). On the other hand, species such as the white and black rhino, black wildebeest, crowned crane, velvet gecko and the cape mountain zebra have come critically close to disappearing altogether, but decisive conservation action is allowing their populations to revive. African wild dogs are also endangered in the region, surviving only in large protected areas (Ledger, 1990). Similarly, the bearded vulture has undergone serious population declines and is now restricted to the Drakensberg range of South Africa and Lesotho. Although this species has several important relict populations in Ethiopia, the European Alps and Pyrenees of Spain and France, all the populations are in decline hence the need to secure the survival of the species in the SADC region (Barnard personal. com.).

2.1.3 Aquatic life biodiversity

This section largely focuses on fish, as there is limited information on other freshwater species in the region.

2.1.3.1 Freshwater fish biodiversity

a) Role of freshwater fish biodiversity

About 13% of the SADC region, excluding South Africa, consists of freshwater ecosystems called wetlands (SARDC/IUCN/SADC, 1994). The wetlands have rich aquatic species diversity that is widely distributed and contains rare species. They are among the most biologically productive ecosystems in southern Africa and provide important seasonal habitats for migratory bird species. According to SARDC/IUCN/SADC (1994), freshwater wetlands can be divided into:

- Lakes that are deep or shallow;
- Rivers, including floodplains;
- Dams that convert stretches of a river into artificial lakes; and
- Palustrine areas (swamps, marshes, ferns, bogs and dambos).

Freshwater fish are an integral part of wetland ecosystems. They are exploited for subsistence and commercial purposes and significantly contribute to the socio-economic development of the region. At the community level, they provide protein; food security; and employment. Fish catches vary from place to place. However, the best yields are associated with major lakes and dams. According to Table 2.2, the region's fish harvest increased from 398 065 tonnes in 1984 to 469 316 tonnes in 1993.

Table 2.2 Trends in freshwater fish harvests in SADC countries (in tonnes)

Country	1984	1993
Angola	7 500	7 000
Botswana	1 500	2 000
Lesotho	13	35
Malawi	65 064	65 000
Mozambique	4 000	4 689
Namibia	400	1 000
South Africa	1 150	2 375
Swaziland	90	110
Tanzania	237 318	300 000
Zambia	64 621	65 307
Zimbabwe	16 409	21 800
Total	398 065	469 316

Source: FAO Yearbook (1995).

b) Status of freshwater fish biodiversity

Some of the freshwater ecosystems of southern Africa such as Lakes Malawi and Tanganyika are rich in endemic and rare fish species. For example, the Rift valley lakes have large numbers of unique species of fish and a few plants because they are isolated from other freshwater systems. The deepest, Lake Tanganyika, has 1 300 species of fish and plants of which over 500 are found nowhere else. They include 230 species of fish. Lake Malawi has 500 species of fish and 95% are endemic (UNEP, 2002).

Fish species diversity and populations in some of the major water bodies of southern Africa are on the decline. Reasons for this include over-fishing, water pollution, drying out of water bodies and the introduction of Invasive Alien Species. The latter include fish and plants as elaborated below:

- Some fish species have been introduced to lakes and dams to produce larger catches. The “Lake Tanganyika sardine” (Kapenta) was brought into Lake Kariba and now provides the majority of the fish catch on that lake. However, such introductions have created problems in some cases. For example, the Nile perch that was introduced into Lake Victoria is a voracious predator that has driven some 200 species to extinction and many others to dangerously low levels (SARDC/IUCN/SADC, 1994). Although similar results have yet to be recorded in southern Africa, high risks exist on Lakes Malawi and Kariba; and,
- The invasion of some of the region’s water bodies by the water hyacinth has modified fish habitats as the weed modifies and degrades aquatic water systems, outgrows local water plants and takes over. When massive quantities of the plant die, they sink to the bottom and their decomposition deoxygenates the water resulting in the death of fish. Furthermore, the weed’s dominant cover absorbs

sunlight thereby seriously affecting the biodiversity of fauna and flora beneath the water level. The water hyacinth is a major problem in Malawi, South Africa, Tanzania, Zambia and Zimbabwe. Other important water weeds in the region include *Salvinia molesta*, *Pistia stratiotes* and *Azolla filiculoides*.

2.1.3.2 Marine biodiversity

a) Role of marine biodiversity

Coastal and marine ecosystems are part of the land most affected by its proximity to the sea and that part of the ocean most affected by its proximity to the land (Hinrichsen, 1998). Seven SADC Member States have coastal and marine ecosystems (Table 2.3). About 17% of the total coastline of Sub-Saharan Africa is in southern Africa and 27% of this is in South Africa. With the exception of Namibia, coastal countries have over 20% of their total population living within 100 kilometers of the coastline. This shows the level of population pressure on coastal resources and their significance to local and national economies as sources of protein (fisheries), minerals (e.g. diamonds and oils) and tourism. They are also a significant source of employment.

Fish exports from the region generate about US\$892 million per year (FAO, 2002). At least 200 000 people are directly employed in fisheries while over one million are dependant on related activities. The bulk of the fish is caught in Angola, Namibia and South Africa. Between 1971 and 2001, the three countries accounted for 90% to 97% of the coastal and marine fish catches in the region. The industry is predominantly industrial in these countries. On the other hand, artisanal and recreational fisheries are common on the east coast where they are valuable, both socially and economically.

Table 2.3 Basic coastal and marine statistics in SADC Member States

Country	Length of coastline (km)	Population within 100 km of coastline, % of total
Angola	1 650	29.4
DRC	160	na*
Mauritius	150	100.0
Mozambique	2700	59.0
Namibia	1 470	4.7
South Africa	2 880	38.9
Tanzania	1 425	21.1
Total	10 435	
Sub-Saharan Africa	63 124	

*na=not available

Source: World Resources Institute (2001) & National consultations.

b) Status of marine biodiversity

Coastal and marine resources in southern Africa are unique because they benefit from the diversity of two different oceans, the Atlantic and the Indian oceans. The coastline along the Atlantic ocean is characterized by long sandy beaches interspersed with rocky outcrops while that of the Indian ocean is rich in coral reefs and mangroves. Four quasi-distinct but interdependent marine ecological regions occur on the sub-continent. They are the Angolan Current, Agulhas bank, Mozambique Currents and Benguela systems.

The Angolan Current of southern Angola supports large concentrations of fish that include Cunene horse mackerel, Benguela hake, several tunas and two species of pilchard. On the other hand, fish species on the Benguela Current of southern Angola, Namibia and western South Africa include sardine or pilchard, round herring, pelagic goby, several mesopelagic mid-water species, Cape horse mackerel and two species of hake. The mackerels and hakes grow larger than the other species and become predatory on smaller fish. Other abundant predators include squids, some tunas, seabirds and the Cape fur seal. The coastal wetlands of Namibia, including three Ramsar sites, provide nursery areas for some fish and are important feeding grounds of palaeartic and resident shorebirds (Simmons, *et al*, 1991). It is also worth noting that there are numerous species of seabirds dependent on the Benguela Current, some of which are very critically endangered. In addition, over-harvesting in this Current has very detrimental impacts on ecosystem structure and functioning, including the top trophic level (Barnard, personal com.).

The Agulhas bank, off southern South Africa, provides a warm and stable spawning environment and many fish species migrate to it for this purpose. On the other hand, the Mozambique Currents of the east coast and Indian Ocean Islands have a much greater diversity of life due to the existence of varied habitats that include extensive deltas, estuaries, mud flats, mangrove forests, sea grass beds and coral reefs. For example, the coastline from Somalia to eastern South Africa supports at least 11 000 species of plants and animals. They include mangrove forests, many species of fish, crabs, shrimps and shorebirds that migrate from Northern Europe.

The overall marine fish catch in southern Africa has fluctuated over the last three decades. However, there is less fish being caught now compared to the 1970s. For example, some 1.8 million to 1.9 million tonnes of fish were caught between 1972 and 1974; less than 1 million tonnes from 1984 to 1986 and about 1.7 million tonnes in 2001. Reasons for this overall decline include: unsustainable harvesting methods and rates; pollution; loss of habitat; and climate change as highlighted below.

i) Unsustainable harvesting methods and rates. These include dynamite fishing; use of mosquito nets in the code end of trawling nets; trawling in the corals and grass beds; and poisoning. The issues range from activities of unlicensed foreign vessels to misreporting of catches by national vessels and the encroachment of industrial vessels into artisanal fishing zones.

ii) *Pollution*. Land-based pollution sources include discharge of sewage, industrial effluents, storm water runoff, wind-blown litter, suspended sediments and agro-chemicals. For example, 63 ocean outfalls along the coast of South Africa discharge about 800 000 cubic metres of sewage and industrial effluent into the sea every day (DEAT, 1999). The industrial effluents come from large fish processing plants, abattoirs, and chemical and manufacturing industries. For example, some 126 factories in and around Maputo in Mozambique have no waste treatment plants and their drains discharge toxic wastes, poisons, non-degradable substances and organic matter into the sea (Chenje, 2000). Similarly, oil spills at sea have caused major problems for the conservation of seabirds in South Africa. On the other hand, plastics kill many marine animals such as turtles that mistake them for jellyfish.

iii) *Habitat loss*. Coastal erosion is a growing problem that is exacerbated by the upstream construction of dams, the development of coastal infrastructure such as artificial lagoons and the clearing of mangroves. On the east coast, coral reefs and sea grass beds are being silted by excessive upstream erosion and sediment discharge. Once settled, the sediments clog the delicate filter feeding apparatus of corals and other reef feeding organisms. The mining of sand, corals, limestone and shells depletes the buffer zone provided by coral reefs and exposes shores to wave action, storm surges and inundation. For example, one million tonnes of coral sand are excavated by hand and transported by canoes in Mauritius every year (Bigot et al, 2000). Coastal erosion is primarily caused by uncoordinated and inappropriate developments in the coastal zone, high population growth and the rapid development of the tourism industry. The need for Environmental Impact Assessments before such initiatives are embarked upon can therefore not be over emphasized.

iv) *Climate change*. Long -term climate change may affect the distribution of marine resources. Increased air temperatures will cause marine animal breeding on land (e.g. African penguins) to be subjected to heat stress, which could reduce reproductive output, by causing animals to abandon their young. Increased temperatures could also alter the structure of some marine populations whose breeding is temperature dependent. An example is the changing ratios of hatchling turtles of different sexes that could be expected because of changed temperatures (Shackleton *et al*, 1996). Furthermore, oceanic currents, especially strong upwelling systems of which the Benguela Current is the world's strongest, could be vulnerable to climate change. Oceanographic changes, such as melting of the Antarctic ice shelves and lowering of regional salinity, could have significant impacts on the strength of the upwelling. Should this happen, the entire climate of southern Africa could be thrown into increasing disarray and variability, with drastically reduced rainfall (Barnard, personal com). Consequently, climate change may have serious implications for terrestrial, freshwater and marine ecosystems. The region should therefore better understand these issues and appropriately plan adaptation responses.

Given the foregoing threats, a number of coastal biota has become vulnerable (e.g. whale shark), endangered (e.g. green sawfish) or critically endangered (e.g. common sawfish). Such developments, coupled with reduced catches and decreases in the mean size of

caught fish, have led to calls for the protection of fish stocks by governments in the region. Fishery management measures introduced include minimum size limits, bag limits, closed seasons and closed areas (marine parks). However, such controls have not always been easy to monitor and enforce.

Marine parks or marine protected areas have been established to limit the harvesting of marine and coastal resources. Southern Africa has about 50 parks along its coast. They are mostly under the jurisdiction of governments and include the Mafia Island park in Tanzania, the Agulhas and Cape Peninsula parks in South Africa and Kissama and Lona national parks in Angola. In situations where marine parks have been formally established and regulated (e.g. in some parts of South Africa), inshore fisheries have successfully recovered (Msiska, *et al*, 2000). Between 2001 and 2004, Mozambique proclaimed three marine parks, the influences of which will be positive, if fully supported.

2.1.4 Agro-biodiversity

a) Role of agro-biodiversity

Agriculture is the major land use in the SADC region. It contributes 35% to the GDP and about 66% of the region's citizens depend on it for food, income and employment. In addition, the sector is the major source of exports in many countries and contributes about 13% to total export earnings and 66% to the value of intra-regional trade. For these reasons, the performance of agriculture has a strong bearing on the rate of economic growth, the level of employment, demand for other goods, economic stability, food security and overall poverty eradication in the region (RISDP, 2004). However, national and household food security in southern Africa is threatened by recurrent droughts. During periods of food insecurity, the region's population, especially the poor, turn to natural resources for survival. This contributes to their over-exploitation and loss of biodiversity.

b) Status of agro-biodiversity.

Agro-ecosystems occur where naturally occurring plants and animals have been replaced by crops and livestock deliberately selected by human beings. The degree of disruption of natural systems varies with the type of agriculture practiced. About 25% of the total land area of southern Africa of about 9.3 million sq. km. is arable (SADC, 2000). The region is very rich in domesticated plant and animal genetic resources. Because of its tropical location, and variations in altitude, rainfall, and evapotranspiration, southern Africa can produce agricultural products found in most parts of the world. They include tobacco, maize, mangoes, bananas, sugarcane and coffee for tropical climates; citrus fruits (e.g. oranges and lemons) and sheep for mediterranean climates; and deciduous fruit (peaches and apples) for temperate climates. In addition, a wide range of crops associated with subsistence farming such as small grain cereals, groundnuts, beans, cowpeas, sweet potatoes, bambaranut and indigenous vegetables are grown. The latter include *Amaranthus hybridus*, *Bidens pilosa* and *Cucurbita spp.*

Both large and small- scale agriculture are widely practiced in southern Africa. However, the value of the latter, which has hitherto been largely for subsistence, is rarely reflected in national accounts. Subsistence agriculture is based on the production of food crops. Notwithstanding, there is a growing trend towards export agriculture even on smallholder farms. This has been through the production of cash crops such as cotton, tobacco, tea, coffee, sugar and wheat. However, maize, a staple food for the majority of the region's population, is still the major crop and is widely grown. Cassava is dominant in some lakeshore districts of Malawi, Tanzania and coastal Mozambique (Chenje, 2000). With recurring droughts, the cultivation of the crop is on the increase as it is more tolerant to dry spells than maize. In Mauritius, sugarcane is the dominant crop (SADC, 2001).

Agro-forestry, which refers to the integration of trees into agricultural systems, offers opportunities for enhancing the diversity of existing cropping enterprises in addition to enhancing soil fertility, soil water holding capacity and livestock feed; and reducing soil erosion. Potential agro-forestry interventions include the introduction of hedgerow intercropping and alley cropping with tree species such as *Leucaena*, *Glyricidia* and *Sesbania sesban*. Apart from enhancing crop diversity, such tree species increase the profitability of smallholder farming systems through activities such as smallholder dairy farming. Farmers in a number of SADC Member States have successfully adopted the latter. Trees provide fodder to dairy cows in such systems.

With the commercialization of crop production in the region, there is some gradual erosion of traditional crop varieties in favour of improved cultivars that give higher yields and better economic returns. This is forcing smallholder farmers to rely on external seed sources that are usually expensive and not readily available. Furthermore, it is narrowing the genetic base of important food crops and leading to the disappearance of land races and the traditional knowledge associated with them. Such knowledge has been transmitted from generation to generation. It has, and continues to play an important role in vital areas such as food security and agricultural development. On the other hand, in drier areas, where intensification is not feasible, extensive agriculture is leading to the loss of wild crop landraces. Consequently, considerable effort has gone into the *ex situ* conservation of traditional crop germplasm at both the national and regional levels through seed banks. The latter level includes the SADC Plant Genetic Resources Centre located in Zambia.

Livestock farming is another important land use system in the region. Given that about 70% of southern Africa is semi-arid to arid, extensive livestock and wildlife production systems are the most suitable and potentially sustainable forms of land use. Furthermore, livestock is an important cultural and economic resource and sustains livelihoods of the majority of the region's citizens. The common livestock species kept include cattle, goats, sheep, donkeys and chickens. However, the overall number of livestock has fluctuated over the last three decades due to drought and diseases such as foot and mouth and anthrax (SARDC/IUCN/SADC, in press). This is partly because livestock production in the region is still highly dependant on traditional subsistence systems that are very vulnerable to climatic changes and disease out-breaks. The threat of livestock diseases

has led some Member States to adopt a cautious approach towards “breaking down” border fences in pursuit of trans-boundary cooperation. The control and containment of livestock diseases has, in the past, relied heavily on game fences and the control of wild and domestic animal movements and translocations.

The prospect of removing barriers to wildlife and livestock movement as perceived under Trans-boundary Natural Resources Management (TBNRM) initiatives has major implications for animal health and disease control strategies in the SADC region. Some of the animal health issues presently of greatest concern in the Greater Limpopo Trans-frontier Conservation Area (TFCA), for example, are (Cumming & WCS AHEAD, 2004):

- The breakdown of controls for foot and mouth disease in Zimbabwe and its spread within the southeastern sector of the country;
- The possible re-invasion of tsetse fly and trypanosomiasis. Apart from information on the control of tsetse fly during the 1970s, and some recent information on its spread, little published information appears to be available on animal health and diseases in the Mozambique sector of the TFCA. There is also evidence of a return of tsetse fly to the Save-Rundi junction area of the Gonarezhou National Park in Zimbabwe; and,
- The northward spread of bovine tuberculosis in the Kruger National Park in South Africa, for which there is published documentation. The possible entry of the disease into Zimbabwe and its status in Mozambique are of great concern.

Another disturbing trend within the livestock sector has been the discard of well-adapted indigenous livestock breeds in favour of the more productive exotic breeds under both large scale and smallholder farming systems. This is leading to the loss of genetic materials that are critical for the long- term development of livestock in southern Africa. According to a recent FAO World Watch List on threatened domestic animal breeds, over half of the domestic animal breeds will be extinct in the next 20 years unless adequate action is taken. With them will die the genetic resources they have developed to survive extreme environments and diseases. Such resources may be vital for feeding and clothing future generations in both developed and developing countries. Apart from the loss of germplasm, there is also the loss of traditional knowledge on livestock management that has been handed down from generation to generation as demonstrated in Table 2.4.

Table 2.4 Traditional remedies for the treatment of some of the commonly encountered disease conditions in farm animals in Zimbabwe

Animal condition	Remedy	Method of application
Eye problems	<i>Solanum indicum</i>	Fruit is crushed and the fluid applied to the eye.
Coccidiosis	<i>Aloe spp</i>	Grind fresh leaves and add to drinking water.
Bloat	<i>Pauzzozia mixta</i>	Leaves crushed and water added; animal made to

Newcastle disease	<i>Sesamum angustifolius</i>	swallow mixture. Crush fresh fruit and add to drinking water for poultry.
Fertility	<i>Loranthus spp</i>	Feeding fresh leaves to rabbits improves kidding rate.
Poor milk flow	<i>Adansonia digitata</i>	Inner core of dried fruit is removed, added to water; animal made to swallow mixture.

Source: Matekaire, *et al* (2004)

2.2 Threats to biodiversity in the SADC region

The SADC region is experiencing human induced erosion of its genetic resources. The trend continues unabated as human activities (e.g. agriculture, exotic timber plantations, mining and urban development) transform habitats and replace indigenous biota. The loss of genetic resources results in the loss of ecosystem goods and services and translates into missed economic opportunities for present and future generations.

Threats to biodiversity in southern Africa include population growth and poverty, agricultural expansion, continued reliance on wood fuel, land degradation, and the introduction of genetically modified organisms and proliferation of invasive alien species. These threats cut across the four-biodiversity sectors elaborated in the previous section (*viz.* forestry, wildlife, aquatic life and agriculture) and are highlighted below.

2.2.1 Population growth and poverty

The population of southern Africa was approximately 193 million people in 2000 (World Bank, 2002). Despite the adverse impacts of the HIV/AIDS pandemic, the region's population is growing at an average rate of 2.3% per annum; ranging from 1.4% in Zimbabwe to 3.3% in Angola (Table 2.5). One of the challenges facing the region is how to increase agricultural output in order to adequately feed the growing population. Given the limited availability of suitable agricultural land, there is increasing pressure to convert marginal lands to agriculture. This is contributing to deforestation, land degradation and loss of biodiversity.

Table 2.5 The human population of southern Africa: 2000.

Country	Population in 2000 (million)	Annual rate of change: 1995-2000 (%)
Angola	12.7	3.3
Botswana	1.6	1.9
Lesotho	2.2	2.2
Malawi	11.0	2.5
Mozambique	17.3	2.4
Namibia	1.7	2.3
South Africa	42.9	1.5
Swaziland	1.0	2.9
Zambia	10.1	2.3
Zimbabwe	12.6	1.4
Total	113.1	2.3

Source: World Bank (2002) & National consultations.

Sub-Saharan Africa has been more seriously affected by HIV/AIDS than any other part of the world. The pandemic has surpassed malaria as the leading cause of death in the region. With an infection rate of about 20% of the entire adult population aged between 15 and 49 years, southern Africa has the largest infected population in the world. The extent of the pandemic has affected virtually every aspect of the lives of people in the SADC region and has now reached crisis proportions (SADC, 2004). The effects of HIV/AIDS include:

- Diverting the limited national and household resources to caring for the infected and the orphaned. This is contributing to reduced economic growth through reduced investment in the productive sectors; and,
- Reducing the agricultural workforce through deaths and spending more time caring for the sick. This has contributed to reduced agricultural production and productivity and increased food insecurity and poverty levels.

The foregoing developments place direct and indirect pressures on the region's biodiversity.

Between 40% and 85% of the region's population is rural and over 40% of its citizens live on less than US\$1 per day. The majority of the population is therefore poor and relies on natural resources and agriculture for survival. Poor people have little choice but to over-exploit the environment. This, in turn, worsens their poverty situation by reducing agricultural productivity and household food security. For example, urban agriculture and stream bank cultivation, which are some of the mechanisms used to cope with increasing poverty, are contributing to land degradation (SARDC/IUCN/SADC, in press).

The growing population is also putting considerable pressure on Non- Timber Forest Products (NTFPs) such as medicinal plants and indigenous fruits, which provide a range of products for subsistence and commercial purposes. For example, more people are relying on medicinal plants for their primary health care needs as modern drugs are becoming either unavailable or prohibitively expensive. This has led to the over-exploitation of certain plants with desirable medicinal properties. Table 2.6 gives some of the documented medicinal uses of selected indigenous plants. It demonstrates that the plants have a multitude of uses, the bulk of which remain unexplored and unexploited. For example, the Neem tree possesses 24 documented medicinal properties and has been used for such purposes for centuries. It has often been referred to as the “village pharmacy”.

Table 2.6 Medicinal uses of selected indigenous plants.

Scientific name	Common name	Medicinal uses
<i>Annona senegalensis</i>	Wild custard apple	Wound healing, chest, colds, diarrhoea & dysentery.
<i>Pterocarpus angolensis</i>	Mukwa, Kiaat	Treatment of skin problems such as sores & ring worms.
<i>Tamarindus indica</i>	Tamarind	Leprosy treatment, fevers, laxative, cardiac diseases & constipation.
<i>Trichilia emetica</i>	Natal mahogany	Parasitic skin infections and inflammations, anti-epileptic & bronchial inflammation.

Source: Adapted from Iwu, et al (1993); Ngozi, (1996); Chidumayo, (1994)

2.2.2 Agricultural expansion

Most of the economies of southern Africa are based on agriculture. About 66% of the population depends on agriculture for food, income and employment; and agricultural output strongly influences the region’s economic growth (Hirji et al, 2002). For example, 90% of Malawi’s population depends on tilling the land; in Mozambique, Swaziland and Tanzania over 80% of the population is dependent on agriculture; while in Angola, Botswana and Zimbabwe, the ratio is still above 70%. There is therefore, a huge demand for land for agricultural expansion in the region. This is partly because the majority of the population practices subsistence farming that is characterized by low productivity and food insecurity. Although shifting cultivation under long fallow cycles is sustainable and less damaging to the environment, short fallow shifting cultivation is not. The latter is the major cause of deforestation in countries like Zambia.

According to Table 2.7, the total land area under cropping in southern Africa increased from 394.8 million ha in 1994 to 396.7 million ha in 2001. The expansion of agricultural land has been caused by the need to feed growing populations and to grow cash crops for export. The situation is exacerbated by the low use of chemical fertilizers and the limited planting of improved seed stock, which lead to low crop yields (SARDC/IUCN/SADC, in press). Consequently, overall per capita food production in southern Africa has declined by 25% since 1980 (Cumming, 1999).

Table 2.7 Land under cropping in southern Africa between 1994 and 2001 (000ha)

Country	1994	2001
Angola	57 500	57 300
Botswana	26 000	25 973
DRC	22 900	22 880
Lesotho	2 329	2 334
Malawi	3 810	4 190
Mauritius	113	113
Mozambique	47 800	48 235
Namibia	38 750	38 820
South Africa	99 000	99 640
Swaziland	1 340	1 390
Tanzania	39 600	39 950
Zambia	35 273	35 280
Zimbabwe	20 370	20 550
Total	394 785	396 655

Source: FAOSTAT data (2004)

The impact of agriculture on the region's biodiversity in future will largely depend on the success of current efforts to modernize and intensify farming and to introduce and implement conducive land reforms. Countries such as Zimbabwe, South Africa, Zambia, Namibia and Botswana have embarked on land reforms.

2.2.3 Continued reliance on wood fuel

With the exception of South Africa and Mauritius, fuel wood is the primary source of energy in the countries of southern Africa. In 2000, total fuel wood consumption in the region was estimated at 159 million cubic metres. Some 41% of this amount was consumed in the Democratic Republic of Congo (Table 2.8).

Table 2.8 Estimated fuel wood consumption in southern Africa (000 m3)

Country	Consumption
Angola	3 740
Botswana	745
DRC	72 707
Lesotho	2 754
Malawi	6 131
Mozambique	31 278
Namibia	872
South Africa	2 183
Swaziland	947
Tanzania	20 787
Zambia	8 773
Zimbabwe	7 894
Total	158 811

Source: FAO (2001)

About 87% of the round wood produced in the region is used as fuel wood. The situation is likely to continue due to the following:

- Fuel wood is the most reliable, affordable and accessible source of energy especially for poor households. Studies have shown that other conventional energy sources like electricity, petroleum products and coal are not widely used because they are not affordable and/or readily accessible. In several countries, the consumption of fuel wood has increased due to increasing prices of petroleum products, electricity and electrical appliances. For example, the proportion of fuel wood used in Malawi's rural households has increased from 90% to 94% in recent years. Angola is the only oil producing country in southern Africa. However, the price of petroleum products in that country makes it impossible for the poor rural population to use such products (ADB, 2000);
- Under most communal area systems, fuel wood is not purchased but just collected by inhabitants of these areas. This "free resource" enables poor households to channel their incomes to other needs;
- In some countries, particularly those in which charcoal use is prevalent, trading in charcoal is a major source of income for some households. For example, in Zambia, the charcoal industry generates about US\$30 million annually and about 60 000 people directly depend on it for the bulk of their income (SARDC/IUCN/SADC, 1994); and,
- Economic reforms recently implemented in the region removed subsidies on energy alternatives. This has further increased the demand for fuel wood and other biomass.

Over reliance on fuel wood in the region has led to widespread deforestation, land degradation and loss of biodiversity. Unfortunately, the demand for this energy source is expected to double in the next 30 years (Chenje, 2000). Table 2.9 shows that although this trend is consistent with the situation in the rest of Africa, there are declines in aggregate wood fuel consumption in the other developing regions of the world except South America. The decreases are due to ready access to affordable and readily available alternatives and high household incomes in those regions. Higher income households tend to prefer cleaner and more convenient energy sources than wood (Arnold et al, 2003).

Table 2.9 FAO projections of wood fuel consumption in the world's developing regions (in million cubic metres)

Region	1970	1980	2000	2010	2020
S. Asia	234.5	286.6	359.9	372.5	361.5
S. E. Asia	294.6	263.1	178.0	139.1	107.5
E. Asia	293.4	311.4	224.3	186.3	155.4
Africa	261.1	305.1	440.0	485.7	526.0
S. America	88.6	92.0	100.2	107.1	114.9
World	1 444.7	1 572.7	1 616.2	1 591.3	1 558.3

Source: Broadhead et al, 2001

2.2.4 Land degradation

Human induced pressure on land resources is causing widespread environmental degradation in the region. In rural areas, the capacity to sustain economic activity is approaching its limits. The 'food production- population imbalance' in these areas is forcing production increases through opening up of new and often marginal land to farming as well as over-cultivation, overgrazing and deforestation (Chenje, 2000; Grainger, 1990).

About 70% of southern Africa is classified as arid or semi-arid. Consequently, the region's climate, which is characterized by low and erratic rainfall, leads to unsustainable land management, which in turn, contributes to flooding. For example, the United Nations Office for the Coordination of Humanitarian Affairs attributes the worsening flooding in southern Africa to land degradation caused by deforestation, overgrazing and soil erosion. It is therefore worth noting that modest investments by developed countries into environmentally sound ecosystems' management might save billions of dollars wasted on crisis management, famine, floods, drought, fire or mudslide relief.

Table 2.10 shows the severity of land degradation in southern Africa. According to the table, about 75% of the region's land surface is degraded. Of this figure, 60% is lightly to moderately degraded; while the remainder is severely to very severely degraded. As

expected, the more severely degraded areas are associated with high human and animal population densities. Land and soil disturbances associated with land degradation reduce soil water holding capacity, soil fertility and the population of beneficial microorganisms. This has adverse effects on agro-biodiversity and food security in the region.

Table 2.10 Severity of land degradation in southern Africa (as % of total land area)

Country	Total land area (000 sq km)	No land degradation	Light to moderate degradation	Severe to very severe degradation
Angola	1 247	61	26	13
Botswana	582	31	57	11
DRC	2 435	33	60	8
Lesotho	30	0	100?	0
Malawi	118	39	61	0
Mozambique	799	31	68	0
Namibia	824	57	21	23
South Africa	1 219	22	13	65
Swaziland	17	0	100	0
Tanzania	945	12	62	25
Zambia	753	7	65	17
Zimbabwe	390	7	92	0
Average		25	60	14

Source: SARDC/IUCNSADC (in press)

2.2.5 Introduction of Genetically Modified Organisms and proliferation of Invasive Alien Species

2.2.5.1 Introduction of Genetically Modified Organisms

Among the impacts of economic liberalization, the quest for high agricultural productivity and recurrent droughts in southern Africa has been an increase in the imports of Genetically Modified Organisms (GMOs), which are products of biotechnology. The latter refers to a suit of techniques employed in the manipulation of life forms to obtain useful products and services. GMOs have the capacity to boost the world's food supply in the face of increasing human populations, especially in developing countries. Within southern Africa, they have mostly come in the form of food aid and improved plant germplasm. However, if not properly handled, GMOs have the potential to adversely affect agro-biodiversity, human health and other biota as follows:

- Genetically modified grain imports might contaminate traditional and modern crop cultivars and reduce genetic diversity through cross-fertilization in situations where smallholder farmers recycle planting seed. This could signal an end to the hardy heritage seeds that have sustained traditional communities in southern Africa for centuries;

- Certain GM foods have the potential to adversely affect human health when consumed. Comprehensive safety studies are therefore required before such foods are availed for human consumption. More importantly, consumers should be given all relevant information on the GM food to enable them to make informed choices. Unfortunately, most of the SADC Member States have not yet developed national biosafety frameworks as enshrined in the Cartagena Protocol on Biosafety. In fact, only seven of the thirteen countries have ratified and/or acceded to the Protocol; and,
- They can potentially affect non- target species such as pollinators and herbivores.

2.2.5.2 Proliferation of Invasive Alien Species

Invasive Alien Species (IAS) are species introduced deliberately or unintentionally outside their natural habitats where they have the ability to establish themselves, invade, out-compete natives and take over the new environments (IUCN, 2000). Such species are found in all categories of living organisms and all types of ecosystems. IAS were mostly introduced into the SADC region for their economic and aesthetic values such as commercial timber, cropping, biological control agents and ornamental functions. However, some of them have significant environmental and economic impacts at genetic, species and ecosystems levels as follows:

- At genetic level, IAS reduce genetic diversity through the loss of genetically distinct populations; the loss of genes and genetic complexes and hybridization of introduced species with native ones (Boudouresque *et al*, 1995);
- At the species and community levels, IAS compete with native biota; replace them; predate them; parasitize on them; cause diseases; and reduce their growth and survival rates. In its compilation of the Red Data List of threatened species, IUCN cited IAS as directly affecting 30% of all threatened birds, 15% of all threatened plants and 10% of all threatened mammals (Carlton, 1998);
- At the ecosystem level, IAS disturb nutrient recycling, pollination and the regeneration of soils and energy, among other things. Apart from reducing biodiversity, IAS threaten the integrity of natural systems. For example, the “fixing” or sequestration of carbon is becoming a major consideration regarding global warming. In some parts of southern Africa, fire prone IAS have replaced indigenous vegetation and may accelerate the release of carbon.

The globalization of markets and increases in global trade, travel and tourism are conveying more species from and to all parts of the world. This has enhanced chances of bio-invasions across ecosystems with economic costs to agriculture, forestry, fisheries and other economic sectors as well as on human health and general welfare. Some of these costs include direct costs of prevention, control and mitigation as shown by the following examples:

- The cost to restore the South African *fynbos* due to invasions by *Pinus*, *Hakea* and *Acacia* species is about US\$169 million (Turpie *et al*, 2000);
- The Cypress aphid killed *Cupressus* trees worth US\$41 million in eight countries of eastern and southern Africa between 1986 and 1991 (Murphy, 1997); and,

- Costs associated with the water hyacinth problem in seven African countries is US\$71.4 million per year (Kasulo, 2000)

With respect to the water hyacinth, it can interfere with hydroelectric power generation schemes and block water intake points. In Lake Chivero (which supplies drinking water to the City of Harare in Zimbabwe), the weed is causing serious water quality problems. Its presence in high organic matter form results in difficulties in water treatment and leads to the siltation of water bodies. Infact, IAS are the single greatest threat to aquatic ecosystems in southern Africa.

2.3 Responses to biodiversity threats in the SADC region

The foregoing threats to biodiversity greatly undermine SADC’s ability to achieve its economic and social development goals. Consequently, the region, with support from its development partners, has responded to some of the challenges through a number of initiatives. They include: developing a SADC Regional Indicative Strategic Development Plan; formulating regional instruments; signing and ratifying international conventions; establishing protected areas; implementing Community Based Natural Resource Management projects; implementing Trans- boundary Natural Resources Management programmes; and carrying out biodiversity related projects and programmes. The initiatives are highlighted in this section.

2.3.1 Development of a SADC Regional Indicative Strategic Development Plan

The SADC Regional Indicative Strategic Development Plan (RISDP) of 2004 is the vehicle for achieving the region’s goals of social and economic development and poverty eradication. The Plan recognizes the importance of agriculture and other natural resources in the attainment of these goals. Box 2.1 highlights the areas of focus for the Plan’s policy interventions for “Sustainable Food Security” and “Environment and Sustainable Development”.

Box 2.1 Areas of focus for the RISDP’s policy interventions for “Sustainable food security” and “Environment and sustainable development” (SADC, 2004).

- √ Improving food availability and promoting the sustainable use of natural resources;
- √ Improving forecasting, prevention, mitigation and recovery from adverse effects of natural disasters;
- √ Creating the requisite harmonized policy environment, as well as legal and regulatory frameworks to promote regional cooperation on all issues relating to environment and natural resource management, including trans-boundary ecosystems;
- √ Promoting environmental mainstreaming in order to ensure the responsiveness of all SADC policies, strategies and programmes to sustainable development;
- √ Conducting regular assessments, monitoring and reporting on environmental conditions and trends in the region;
- √ Building capacity, sharing information and creating awareness on problems and

- ✓ perspectives in environmental management; and,
- ✓ Ensuring coordinated regional positions in the negotiation and implementation of Multilateral Environmental Agreements and other agreements.

Specific short, medium and long- term plans are being formulated to operationalise focal areas of the RISDP. The Regional Biodiversity Strategy is part of such efforts.

2.3.2 Formulation of regional instruments

In line with SADC's drive towards regional cooperation in natural resource management, its Member States have signed and/or ratified a number of biodiversity related protocols. The protocols provide legally binding frameworks for regional collaboration among Member States and demonstrate the region's political and technical will to mainstream the environment (including biodiversity) into its development strategies. The protocols include:

- The Protocol on Shared Watercourse Systems;
- The Protocol on Trade;
- The Protocol on Education and Training;
- The Protocol on Culture, Information and Sport;
- The Protocol on Energy;
- The Protocol on Mining;
- The Protocol on the Development of Tourism;
- The Protocol on Health;
- The Protocol on Wildlife Conservation and Law Enforcement;
- The Fisheries Protocol; and,
- The Forest Protocol.

The foregoing protocols contain elements of biodiversity and are at various stages of implementation. However, most of them have not yet been fully integrated into national policies and laws (IUCN, 2003).

It should, however, be noted that despite its cross cutting nature, there is no stand-alone regional protocol on biodiversity. Such a protocol would enhance SADC's commitment to biodiversity conservation and its sustainable use. Furthermore, the protocol would demonstrate the cross cutting nature of biodiversity through cross-references to other protocols. It would therefore represent an important step forward in the integrated and comprehensive management of biodiversity as a basis for sound natural resource management in southern Africa.

2.3.3 Signing and ratification of international instruments

SADC Member States have signed, and/or ratified and acceded to a number of international instruments related to biodiversity. They include:

- The UN Convention on Biological Diversity;
- The Cartagena Protocol on Biosafety;
- The World Trade Organization;
- The FAO International Treaty on Plant Genetic Resources for Food and Agriculture;
- The Ramsar Convention on Wetlands;
- The International Union for the Protection of New Varieties of Plants;
- The UN Convention to Combat Desertification;
- The UN Convention on the Law of the Sea;
- The World Intellectual Property Organization;
- The UN Framework Convention on Climate Change; and,
- The Kyoto Protocol.

The foregoing international instruments recognize that sustainable natural resource management is essential for poverty reduction and lasting improvement of rural livelihoods in southern Africa. However, with the exception of the CBD, the United Nations Convention to Combat Desertification and the World Intellectual Property Organization that have been ratified by all Member States, some countries have yet to do so with the other international instruments (Table 2.11). In addition, Member States are at different stages of implementing provisions of the instruments. Notwithstanding, a number of regional programmes and projects related to some of the instruments are being implemented. It is however interesting to note that although the thrust of most of the instruments is similar, there is little to no coordination in their implementation at both national and regional levels. This has resulted in the duplication of efforts and inefficient use of scarce human and financial resources in some cases.

Table 2.11 Status of Member States regarding international instruments

Country	CBD	Cartagena	ITPGRFA	Ramsar	CCD	Kyoto	WIPO
Angola	r	-	S	-	r	-	m
Botswana	r	r	-	r	r	a	m
Lesotho	r	a	-	r	r	a	m
Malawi	r	-	r	r	r	a	m
Mozambique	r	r	-	s	r	r	m
Namibia	r	-	s	r	r	a	m
S. Africa	r	a	-	r	r	a	m
Swaziland	r	-	s	-	r	-	m
Zambia	r	a	s	r	r	s	m
Zimbabwe	r	-	s	-	r	-	m
DRC	r	-	a	r	r	r	m
Mauritius	r	a	s	r	r	r	m
Tanzania	r	a	s	r	r	r	m

Key: r = ratified; s = signed; a = acceded; m = member

2.3.4 Establishment of Protected Areas.

SADC Member States have set aside about 15% of their total land area as protected areas consisting of gazetted forests and national parks. The land coverage of protected areas ranges from 3.4% in Angola to 30.4% in Zambia (Table 2.12). The areas are managed for environmental protection, conservation of biodiversity, water catchment functions, wildlife reservoirs, commercial exploitation of indigenous timber, and for aesthetic values.

Protected areas have had the following impacts:

- These vast areas and their rich forest and wildlife biodiversity have facilitated the development of a booming tourism industry in southern Africa. Tourism has become the third largest contributor to the region's GDP after agriculture and mining;
- They provide habitats for endangered species of flora and fauna. For example, the bulk of "important bird areas" for threatened or endangered bird species such as the crowned crane and bearded vulture are found in protected areas;
- Because of their rich biodiversity, protected areas play a key role in the *in situ* conservation of a wide range of genetic resources. However, it has been argued that the existing protected areas network does not adequately represent the full range of natural ecosystems in most countries of southern Africa; and,
- Over 70% of the protected areas lie across international boundaries. They therefore provide opportunities for Trans-boundary Natural Resource Management initiatives within the region.

Table 2.12 Extent of protected areas in southern Africa.

Country	Area (000 ha)	% of total land area
Angola	8 220	3.4
Botswana	10 499	18.5
DRC	14 637	6.4
Lesotho	680	22.4
Malawi	1 058	11.2
Mozambique	12 875	16.1
Namibia	11 216	13.6
South Africa	7 314	6.0
Swaziland	76	4.3
Tanzania	26 262	30.0
Zambia	22 650	30.4
Zimbabwe	5 850	15.0
Total/Average	121 298	14.8

Source: United Nations (2003) & National consultations.

Existing legislation in southern Africa precludes neighbouring communities from accessing goods and services from protected areas. This has created ‘islands of green’ surrounded by degraded communally owned landscapes. The net result has been increased poaching, illegal settlements and loss of biodiversity in some protected areas. Community participation and the development of appropriate Access and Benefit Sharing arrangements are therefore critical for the sustainable management of protected areas. The Communal Areas Management Programme for Indigenous Resources in Zimbabwe presents a major participatory approach for communities that neighbour national parks areas. However, the approach has yet to find wide application for other natural resources such as commercial timber and veld products (Machena *et al*, 2005).

2.3.5 Implementation of Community Based Natural Resource Management Initiatives.

For more than two decades, some countries in southern Africa have been implementing strategies that support human livelihoods through the sustainable use of biological resources within the context of Community Based Natural Resource Management (CBNRM). CBNRM is an incentive based conservation and development model that is adaptively implemented by and for people who live with and directly depend on biological resources and who therefore have the greatest impact on such resources. In this model, communities are given rights of access to wild resources and legal entitlements to benefits that accrue from using the resources. This is intended to create positive social and economic incentives for the people to invest their time and energy in natural resource conservation. Typically, CBNRM initiatives have been implemented in ecologically marginal areas, with limited capacity for other natural resource based economies such as agriculture.

Operationally, CBNRM involves the following:

- The devolution of control and management responsibilities on natural resources from the State to the local people. This is done through appropriate legislative and policy changes; and,
- Building the technical, organizational and institutional capacity of local communities to assume management responsibilities over natural resources.

The success of CBNRM has largely depended on the level of devolution; donor commitment; policy changes; and links with tourism and hunting. The key economic driver for CBNRM in southern Africa has been wildlife (large mammals), mostly through trophy hunting and eco-tourism outside protected areas. The potential role of veld products in these areas is only beginning to be realized through value addition and commercialization. Such products have potential for nutritional, pharmaceutical and industrial use; and for generating income for rural people. Consequently, they have the capacity to broaden the economic viability of CBNRM initiatives. The main advantage of veld products is their wider distribution when compared to wildlife.

2.3.6 Implementation of Trans-boundary Natural Resource Management programmes.

There has been an increase in Trans-boundary Natural Resource Management (TBNRM) initiatives in southern Africa in recent years. These initiatives recognize the trans-boundary nature of natural resources and aim at managing them as such. According to Griffin *et al* (1999), TBNRM is defined as any process of cooperation across boundaries that facilitates or improves the management of natural resources for the benefit of all parties concerned. It falls under the following main categories:

- Trans-frontier Conservation Areas (TFCAs) in which the main objective is to conserve natural resources by linking protected areas across international boundaries. Their agenda is usually that of state conservation agencies and large national and international non-governmental organizations. An example of a TFCA is the Greater Limpopo Trans-frontier Park. The Park consists of the Kruger National Park in South Africa; Gonarezhou National Park in Zimbabwe; and the Coutadha 16 hunting concession region, Banhire and Zinave National Parks in Mozambique. Another example is the Lubombo TFCA that covers Ndumo-Tembe-Futi and Goba in Mozambique; Malolotja, Lubombo and Nsuban in Swaziland; and Kosi Bay and Pongola in South Africa; and,
- Trans-boundary Natural Resource Management Areas (TBNRMAs) in which the main objective is to sustainably manage natural resources in trans-boundary areas (ecosystems) for sustainable and improved livelihoods. TBNRMAs are to some extent an extension of the CBNRM concept to trans-boundary areas. An example of a TBNRMA is the Zimbabwe, Mozambique and Zambia initiative. Its objective is to facilitate dialogue among relevant stakeholders on how to effectively manage trans boundary-natural resources in the Gurube district of Zimbabwe; the Zumbu district of Mozambique; and the Luangwa district of Zambia. The three districts converge upstream of the Cahora Bassa Dam on the Zambezi river.

The responsibility for managing TBNRM initiatives lies with the Member States concerned. This is largely because they depend on or assume similar levels of devolution and equally supportive policies and legislation across the participating countries. However, given that most TBNRM projects are still in their infancy, their impact on trans-boundary natural resource management and on human welfare in southern Africa still remains to be seen. Notwithstanding, the issue of adequate national capacity is very critical for their success. This is largely because the TBNRM process impinges on national sovereignty regarding certain natural resources. Unfortunately, some of the Member States have not yet clearly articulated their national policies on TBNRM. This apparent lack of clarity and consensus at national level partly explains the slow rate of implementation of some of the TBNRM initiatives. There is therefore an urgent need for Member States to develop national consensus, policies and capabilities on the subject. The capacity of local communities is also critical in TBNRM initiatives. Unfortunately, there is limited evidence to show that communities have been adequately consulted and made aware of the long and short-term implications (e.g. displacements) of some of TBNRM initiatives.

Another important consideration in TBNRM is the prospect of removing barriers to wildlife, domestic animal and human movement within and across countries. This has major implications on animal health and disease control, production and export markets in each country. A policy framework on animal health and disease control for TFCAs is therefore necessary.

2.3.7 Carrying out biodiversity related projects and programmes.

SADC, with financial and/or technical support from its development partners, is implementing a number of biodiversity related projects and programmes in the region. They include the following:

a) Environmental Education Programme. It is aimed at establishing a SADC network for environmental education. Its activities include the development of environmental education policy and the training of trainers.

b) SADC Biodiversity Support Programme. Its objective is to enhance and/or establish capacity and institutional mechanisms that enable Member States to collaborate in regional biodiversity conservation; to prevent and control the spread of Invasive Alien Species; and to apply Access and Benefit Sharing principles. The Regional Biodiversity Strategy is developed under the auspices of this Programme.

c) SADC Sub-regional Action Programme to combat desertification. Its objective is to build capacity for implementing the United Nations Convention to Combat Desertification in selected areas. The Programme has identified and selected the following regional Centers of Excellence (Lead Institutions): the Desert Foundation of Namibia for capacity building and research in desertification; the Tanzania Traditional Energy Development and Environment Organization/Commission on Science and Technology for sustainable rural energy development; the Faculty of Law at the University of South Africa on environmental law; the Faculty of Agriculture at the University of Zimbabwe for improved range land utilization; and the Farmer Support Group at the University of Natal (South Africa) for community participation, appropriate technology and indigenous knowledge.

d) Regional Early Warning Programme. It is responsible for forecasting the food production situation in the region. The resultant information provides advance early warning on the food security situation in Member States and the region as a whole.

e) SADC Plant Genetic Resources Centre. Its objectives are to:

- Keep the SADC plant gene base collection through the maintenance of long term storage facilities; and,
- Ensure the efficient coordination of plant genetic resources work within the region.

The Centre has collected and stored germplasm of some traditional crop varieties found in the region. It is therefore playing a key role in the *ex situ* conservation of agrobiodiversity as it compliments activities of national gene banks.

f) *Miombo Eco-region Conservation Programme*. Its goal is to contribute to the maintenance of biodiversity and functional ecosystems for the benefit of people and nature in the region. The Programme has identified biodiversity rich areas for possible conservation and sustainable use in the miombo eco-region of southern Africa.

g) *The Southern African Natural Products Association (PhytoTrade Africa)*. It is a private sector initiative aimed at the value addition, commercialization and marketing of selected biological resources such as Non-Timber Forest Products (NTFPs). A number of NTFPs are already being processed, packaged and marketed nationally, regionally and internationally.

h) *Zambezi Basin Wetlands Project Phase 2*. Its purpose is to influence the development of national and regional policies and protocols that maintain and/or improve the ecological integrity of wetland ecosystems, while improving the well being of wetlands communities.

i) *Regional Community Based Natural Resource Management Capacity Building project*. Its goal is to contribute to poverty alleviation and sustainable livelihoods at rural household level from the management of natural resources by local communities. It attempts to introduce a peer review system based on standards that should be used to promote the delivery of CBNRM programmes.

j) *Regional Agro forestry project*. It aims to improve food security, reduce poverty and conserve the environment in southern Africa through the development and dissemination of appropriate agroforestry technologies. It operates in Malawi, Mozambique, Tanzania, Zambia and Zimbabwe.

k) *The Southern African Botanical Diversity Network (SABONET)*. Its objectives are to:

- Inventory, document and publish the flora of southern Africa.
- Build the capacity of botanists through short and long term training; and
- Enhance the region's infrastructure for collecting, collating and storing specimens.

Ten SADC Member States are participating in the Network that has produced several botanical documents including the Red Data List and trained up to 22 people at postgraduate level.

l) *Partnership for the Development of Environmental Law and Institutions in Africa (PADELIA)*. Its objective is to harmonize and strengthen environmental legislation that is trans-boundary in nature. Seven Member States are participating in the programme.

m) The Southern African Biodiversity and Environment Programme (BEP). The objective of the programme is to enable southern African countries to make informed decisions on biotechnology (biosafety) in relation to environmental management. All SADC Member States are involved in the initiative.

n) SADC Rhino project. It focuses on the recovery of the rhino, a threatened species in the region.

The foregoing examples demonstrate that SADC and its development partners are doing considerable work to address some of the challenges facing biodiversity in the region. The Regional Biodiversity Strategy builds upon and strengthens those efforts that fall within some of its 50 focal areas (sets of activities).

ANNEX III: CONSTRAINTS TO BIODIVERSITY CONSERVATION IN SADC MEMBER STATES

As part of the Regional Biodiversity Strategy preparation process, a regional consultative workshop on the subject was convened in Swaziland in June 2002. Member States were asked to highlight the major constraints to biodiversity conservation and its sustainable use in their countries. These national level constraints were used as building blocks for the Regional Biodiversity Strategy, which is a constraint-based initiative. Member States generated the constraints from their National Biodiversity Strategy and Action Plans (NBSAPs) and other national planning frameworks such as Poverty Reduction Strategy Papers, National Conservation Strategies, National Environment Action Plans and State of the Environment Reports. The country level information has been updated to incorporate developments that took place since 2002.

This Annex presents the national constraints as identified by Member States at the Swaziland regional workshop and subsequently updated through national consultations.

3.1 Angola

3.1.1 Status of the NBSAP

The Global Environment Facility (GEF) and the United Nations Development Programme (UNDP) are funding and supporting the process of elaborating on the NBSAP. The exercise, which started in October 2004, will take 18 months.

3.1.2 Constraints identified

- Insufficient information and scientific data on the status of biodiversity in the country.
- Lack of inventory and monitoring systems.
- Insufficient legislation for biodiversity protection.
- Weak institutional arrangements for planning and managing the utilization of biodiversity.
- Poor management of the protected areas.
- Insufficient funds for implementing projects on biodiversity and the sustainable use of natural resources.

3.2 Botswana

3.2.1 Status of the NBSAP

The NBSAP was finalized in December 2004. It is in the process of being printed for distribution to stakeholders.

3.2.2 Constraints identified

- Fragmentation and gaps in environmental legislation and lack of enforcement.
- Lack of gazetted National Conservation Act.
- Absence of redress of the Convention on Biological Diversity (CBD) obligations within the national development plan.

- Lack of cross- sectoral knowledge of the CBD and country obligations.
- Lack of institutionalisation of Clearing House Mechanisms (CHMs) within government systems.
- Uncontrolled use of forest reserves by the tourism industry.
- Few flora and fauna inventories that do not cover the whole country.
- No synthesis of environmental projects' outputs. Current, past and/or end of project reports are unavailable, inaccessible and/or lost.
- Lack of coordination and strategy in the area of trans boundary initiatives.
- Lack of inventory of biodiversity expertise in the country.
- No cross- sectoral training needs assessments.
- No country strategy for biodiversity training and capacity building.

3.3 Lesotho

3.3.1 Status of the NBSAP

The NBSAP was completed and approved by Cabinet. Based on the country study, GEF is supporting a project on the conservation of biodiversity in the southern part of Lesotho.

3.3.2 Constraints identified

- Inadequate participation of communities in the design, management and planning of biodiversity programmes due to the top-down approach that is used.
- Low levels of awareness and appreciation of the value of biodiversity conservation and inadequate incentives for its conservation.
- Unsustainable use of biodiversity outside protected areas due to inadequate provision and protection of community rights to claim exclusive rights to manage their biological resources.
- Inadequate knowledge on ecosystems functions and on the conservation status of species.
- Limited appreciation of the importance and contribution of biodiversity to the national economy and to local communities by policy makers.
- Inadequate integration of biodiversity conservation into sectoral plans, policies, legislation and programmes.
- Limited application of Environmental Impact Assessment (EIA) procedures.
- Inadequate representation of the full range of natural ecosystems in the protected area network.
- Lack of appreciation of the importance of traditional knowledge systems to biodiversity conservation.
- Inadequate research and monitoring of biodiversity threatening processes.
- Lack of a national policy on the conservation and sustainable use of biodiversity.

3.4 Malawi

3.4.1 Status of the NBSAP

Malawi produced a draft NBSAP in 1999. However, it became apparent that the draft document was not acceptable to most stakeholders. It was therefore decided that the document be reviewed. The document was finalized in July 2005.

3.4.2 Constraints identified

- Limited alternative livelihood sources to address poverty.
- Limited harmonisation and integration of biological biodiversity, sustainable use and equitable sharing of biological resources into sectoral and cross-sectoral policies, plans and programmes, including EIAs.
- Limited specialized personnel dealing with the conservation and sustainable use of biological diversity.
- Inadequate valuation of biological resources to determine their economic value and associated management costs.
- Inadequate incentives for local level participation in biodiversity conservation and its sustainable use as well as lack of recognition of indigenous knowledge systems.
- Inadequate enforcement of initiatives on the conservation, sustainable use and fair and equitable sharing of biological resources.
- Unsustainable financing mechanisms for biological diversity conservation and sustainable use initiatives.
- Inadequate support to NGOs and the private sector in diversity conservation and sustainable use initiatives.
- Inadequate appreciation and awareness of the importance of biological diversity.
- Inadequate representation of the full range of natural ecosystems in the protected area network.
- Inadequate participation of local communities in the management and design of biodiversity programmes.

3.5 Mozambique

3.5.1 Status of the NBSAP

The NBSAP was completed and approved by Cabinet in July 2003. However, its implementation has not started due to financial constraints.

3.5.2 Constraints identified

- Inadequate biodiversity inventory and monitoring systems.
- Inadequate implementation of appropriate *in situ* and *ex situ* conservation measures.
- Inadequate representation of the full range of natural ecosystems in the protected area network.
- Inadequate coordination and weak institutional framework.
- Inadequate legal framework on biodiversity issues.
- Inadequate incentives for local level participation in biodiversity conservation and sustainable use initiatives.
- Lack of appreciation of the importance of traditional knowledge systems to biodiversity conservation.
- Inadequate knowledge and control of Alien Invasive Species and Genetically Modified Organisms (GMOs).
- Low level of awareness and appreciation of the value of biodiversity conservation.
- Inadequate incentives for community participation in biodiversity conservation and sustainable use.

- Unsustainable financing mechanisms for biodiversity conservation and sustainable use initiatives.

3.6 Swaziland

3.6.1 Status of the NBSAP

The document was completed but is still awaiting Cabinet approval.

3.6.2 Constraints identified

- Inadequate representation of the full range of natural ecosystems in the protected area network.
- Unsustainable use of biodiversity outside protected areas due to inadequate provision and protection of community rights to claim exclusive rights to manage their biological resources.
- Inadequate conservation of agro-biodiversity.
- Bio safety issues not adequately catered for in the existing biodiversity initiatives.
- Weak institutional and legal frameworks for implementing biodiversity conservation.
- Low levels of awareness and appreciation of the value of biodiversity conservation.

3.7 South Africa

3.7.1 Status of the NBSAP

The NBSAP has been completed and now awaits approval by the Director General of the Department of Environmental Affairs and Tourism.

3.7.2 Constraints identified

- Lack of integrated and coherent national biodiversity information system.
- Poorly developed strategies for conservation and sustainable use outside protected areas.
- Lack of a systematic approach to protected area development and management, resulting in a protected area network that is not representative.
- Lack of a strategy on agro-biodiversity.
- No uniform strategies for the application of the ecosystem approach to conservation.
- Lack of integration and consolidation of *ex-situ* conservation initiatives.
- No overall strategy or mechanisms for promoting the sustainable use of biodiversity (e.g. CBNRM programmes).
- No national strategy or regulatory framework for Access and Benefit Sharing.
- Low levels of public awareness around biodiversity and its economic value.
- No national strategy or mechanisms for the control and eradication of Invasive Aliens other than plants.
- Poorly developed incentive programmes.
- Complex and often inefficient institutional arrangements, including lack of clarity on the division of responsibilities.
- Poor progress in mainstreaming biodiversity into other sectoral policies and programmes.

3.8 Namibia

3.8.1 Status of the NBSAP

Biodiversity in Namibia-Namibia's ten-year strategic plan of action for sustainable development through biodiversity conservation 2001-2010, ISBN 0-86 976-587-6) was published as a 138-page booklet with glossy cover in 2002, in preparation for the World Summit on Sustainable Development. It was Namibia's first sustainable development strategy. It received and incorporated ministerial feedback from stakeholder ministries in 2002. It is hoped that the document will be submitted to Cabinet by the Ministry of Environment and Tourism and be endorsed without problems due to the very wide stakeholder and specialist consultations during its preparation.

3.8.2 Constraints identified

i. Conservation of biodiversity

- Gaps in the protected area network
- Communal and freehold conservancies
- Conservation measures in and outside protected areas
- Address the needs of endemic and threatened species
- *Ex-situ* and *in-situ* conservation capacity

ii. Sustainable use of biological resources

- Capacity to harvest resources sustainably
- Monitoring and incentive systems for sustainable use
- Conservation and sustainable use of agricultural biodiversity
- Use of indigenous knowledge systems in Natural Resource Management (NRM).
- Bio prospecting and bio trade
- Safe use of biotechnology

iii. Environmental change and threats

- Reliable environmental decision making
- Monitoring, detecting and predicting environmental change
- Monitoring biodiversity and ecological function
- National capacity in biosystematics
- Monitoring environmental threats
- Climate change
- Desertification and land degradation
- Alien Invasive Species
- Pollution
- Restoring degraded ecosystems

iv. Sustainable land management

- Information to guide land use planning and land reform
- Biodiversity – compatible land & resource uses / management
- Sustainable agriculture
- Sustainable forest management
- Sustainable desert, savanna and wood land management
- Biodiversity & ecological functions of mountain ecosystems

v. Wetland management

- Ecological functions and diversity
- New wetland conservation areas
- Integrated land & water management
- Awareness of wetland values & threats

vi. Coastal and marine ecosystem management

- Impacts of resource use activities
- Policy and legislation
- Aquaculture activities
- Marine protected areas
- Pollution of coastal waters
- Taxonomic collections and databases
- Marine bio prospecting
- Integrated Coastal Zone Management
- Information and awareness

vii. Integrated planning

- Integrated sectoral planning and implementation
- Policy and legal frameworks
- Decentralisation and regional management
- Partnerships involving government, NGOs and the private sector

viii. Namibia's role in the larger world community

- Obligations to international treaties
- International assistance and national budgets for environmental management
- International research collaboration

xi. Building capacity for biodiversity management

- Public awareness of biodiversity
- Management capacity
- Effective participation of disadvantaged groups
- Strengthening community capacity
- Strengthening biodiversity centres of excellence

3.9 Zambia

3.9.1 Status of the NBSP

Zambia completed its NBSP in 1999. In terms of implementation, a project on protected area networks is already underway with GEF funding. Another project is being developed for the add-on enabling activities under GEF.

3.9.2 Constraints identified

- Inadequate conservation of ecosystems and protected areas due to inadequate knowledge of these ecosystems and protected areas, poor representation of all the ecosystems in the protected area network and inadequate protection of protected areas.

- Unsustainable use and management of biodiversity mainly as a result of lack of incentives.
- Inequitable sharing of benefits from the utilisation of biodiversity, again as a result of inadequate provision and protection of community rights to claim ownership and benefits from biological resources.
- Inadequate conservation of crop and livestock diversity.
- Inadequate legal and institutional frameworks and the needed human capacity to deal with issues of bio safety.
- Inadequate legal and institutional framework and needed human capacity to implement programmes for biodiversity conservation.

3.10 Zimbabwe

3.10.1 Status of the NBASP

Zimbabwe completed its NBASP in 1998. The document was officially launched in 2000. However, there is consideration for an addendum to include issues of biosafety, biotechnology and desertification. Implementation of the Plan has started. GEF funded projects on Traditional Medicinal Plants and National Self Capacity Assessment are being carried out. A number of other project proposals have been developed.

3.10.2 Constraints identified

- Absence of comprehensive and elaborate biodiversity inventory and monitoring programmes.
- Inadequate incentives for local communities and individuals to undertake biodiversity conservation and sustainable use initiatives in both protected and non- protected areas.
- Inadequate environmental awareness, education and training at various stakeholder levels.
- Limited appreciation of the importance and contribution of biodiversity to the national economy and to local communities by policy makers.
- Inadequate, conflicting and poorly enforced pieces of legislation that tend to adversely affect biodiversity conservation and its sustainable use. This has now been addressed through the Environment Management Act (EMA).
- A limited financial base and institutional capacity to facilitate the formulation, implementation and monitoring of biodiversity projects at various levels.
- Inadequate affordable alternatives to reduce reliance on natural resources at local level.
- Inappropriate research and extension approaches in biodiversity conservation and its sustainable use.

ANNEX IV: REFERENCES

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