4 BOTSWANA BIODIVERSITY STRATEGY

4.1 Introduction to the Strategy

A strategy is a policy document, and it will only have a real impact if it is implemented, which requires commitment and active engagement by all stakeholders. In the case of biodiversity – we are all stakeholders in one form or other and successful implementation of the biodiversity strategy therefore requires that we all participate in its implementation. The best way to ensure active participation in this respect is to equip people with an awareness and understanding of the importance of maintaining biodiversity and why it is crucial that biodiversity components are used sustainably. Awareness raising and implementation activities have therefore been incorporated as important parts of the strategy and action plan.

The right to utilise components of biodiversity is often taken for granted, but with that right comes a responsibility to ensure that the resources are used sustainably and not wasted or depleted. This responsibility extends to all sectors, including government, the private sector and civil society. Today, many development and economic activities are often referred to as being sustainable, and might be so in the short term, but the long-term effects are not always clear. In the case of biodiversity and ecosystems it is therefore important to take a longer-term perspective and to recognise the needs of future generations of Batswana in current planning and implementation of activities.

The only way to know if our actions are truly sustainable is to establish a baseline of data and to undertake continued monitoring to see if levels are maintained and to detect any changes. So while this strategy is aimed at stimulating and encouraging the use of biodiversity resources for long-term social and economic benefits, it also addresses necessary actions to ensure that the resources are not wasted in the short term.

4.2 Strategy components

The Biodiversity Strategy and Action Plan has been divided into 11 strategic objectives, reflecting the long-term desired state of the nation. These are:

	Strategic objectives
1	Better understanding of biodiversity and ecological processes
2	Long-term conservation and management of Botswana's biological diversity and genetic resources
3	Efficient and sustainable utilisation of all components of biodiversity in Botswana through appropriate land and resource use practices and management
4	An institutional environment, including human capacity, conducive to effective biodiversity conservation, sustainable use and management.
5	Coping with environmental change and threats to biodiversity
6	Appropriate valuation/appreciation of biological diversity, and raised public awareness on the role of biodiversity in sustainable development and public participation in biodiversity related activities and decision making
7	Fair access to biological resources and equitable sharing of benefits arising from the use of biological resources
8	Safe industrial and technological development and other services based on national biodiversity resources for future prosperity
9	Improved availability and access to biodiversity data and information, and promotion of exchange of information
10	Recognition of Botswana's and the Southern African Region's roles with regards to Biodiversity
11	Implementation of this Biodiversity Strategy and Action Plan

Each strategic objective has then been broken down into strategic targets, followed by detailed actions designed to effectively achieve these targets. This chapter outlines each main strategic objective and related strategic targets and actions. The strategic targets have been formulated as statements, describing the desired state and a brief justification is given as to why the strategic target is important. The action-points are described as actions. The Action Plan is presented in table format in Chapter 5.

The strategic objectives and targets have not been prioritised, but an attempt has been made to put them into a logical order. Some of the strategy components require a crosscutting mix of activities, and some repetition and duplication is therefore unavoidable. The important thing to bear in mind is that all the strategic objective, targets and actions complement and relate to each other, and the strategy elements and actions should therefore not been seen in isolation, but as part of a whole process - leading to the vision.

4.3 Strategy timeframe

The implementation timeframe of the BSAP is 5 years in general. A few activities however have a 10 year timeframe. Initially the BSAP was intended to coincide with NDP 9, i.e. to run from 2003/04 to 2008/2009. Due to various delays, the starting date for implementation of the strategy and action plan has slipped, and it is now likely that implementation of the BSAP will overlap with NDP 10. This is in fact an advantage as it means that the BSAP can be used directly to ensure that activities are incorporated in the next national development-planning phase.

The timeframe for each activity is indicated in the Action Plan in Chapter 5.

The BSAP should be coordinated by an agency within the government and it is envisaged that this coordinating role will be carried out by the NCSA until and if a Biodiversity Authority is established.

OBJECTIVE 1

BETTER UNDERSTANDING OF BIODIVERSITY AND ECOLOGICAL PROCESSES

WHY

Conservation and sustainable use of biodiversity are complex issues. In order to know if our actions and activities are sustainable, and to calculate environmental costs and benefits and long-term effects of different land use options, we need reliable biological base-line data and long-term monitoring of the status of our genetic resources. Reference collections and taxonomic research are essential tools in identifying organisms, species and varieties.

WHAT DOES NDP 9 SAY?

Paragraph 14.5 encourages research in fields such as biodiversity conservation, natural resources management, energy, environmental governance and planning, and resource economics. A National Strategic Plan for integrated environmental research will be assessed during NDP 9 and if found appropriate developed an implemented.

Paragraph 14.39 states that "The intrinsic and total economic value of most natural resources is not known and neither is the cost of environmental damage. Resource monitoring will be strengthened, and the results of trend analysis will be incorporated in policies, programmes and projects"

WHAT DOES NCS SAY

Paragraph 6.2.1 states that "Through the NCS it is intended that all important ecosystems, wildlife habitats, landscapes and cultural features should be surveyed in detail preceding the preparation of management plans.

Paragraph 2.1.2 emphasises the importance of access to reliable and up-to-date information about the quality of the country's natural resources as a basis for government decisions.

In addition, paragraph 4.8.11 calls on the establishment of a research and development strategy, specifically in support of the NCS goals.

Objective 1 - Strategic targets overview

1.1	National inventories of components of biodiversity (species and ecosystems) established
1.2	National biodiversity reference collections established for key groups
1.3	A focused biodiversity research programme aimed at establishing biodiversity trends, understanding ecological processes and finding suitable biodiversity management solutions
1.4	Better understanding of the effects of socio-economic issues on biodiversity, including demographic change and HIV/AIDS

Strategic targets details

1.1 National inventories of components of biodiversity (species and ecosystems) established

Justification

National inventories of flora and micro-organisms are currently not available and fauna inventories are incomplete. Inventories are essential to determine conservation status and should form the basis for biodiversity planning and setting of conservation priorities.

Vegetation maps and detailed descriptions of vegetation form the basis of biological conservation and management practices. With the exception of the deserts, vegetation is the most obvious and easily monitored manifestation of an ecosystem,asplantsformthebaseof the trophic pyramid. In short, vegetation represents an integration of all the environmental factors that make up an ecosystem and constitutes a readily measurable indicator of the health and stability of that ecosystem.

Actions to achieve targets

1.1.1 Clarify and establish institutional responsibilities and focal organisations (wildlife, flora, birds, fish, insects, fungi etc) for collection and maintenance of national biodiversity data (Ref Objective 9 – Access to data), and establish mechanisms to facilitate and encourage deposit of biodiversity data collected by other data collectors and researchers at these focal organisations (Ref 9.4.2 – Depository for biodiversity research data).

1.1.2 Establish national data collection standards through peer reviewed process taking cognisance of international and regional standards, and disseminate to concerned institutions (Ref 9.1- Data standards)

1.1.3 Set up national survey programmes for under-surveyed biodiversity groups, with priority given to the rare and endangered and data deficient species, and implement programme (Ref 1.2.1 – target taxa for reference collections)

1.1.4 Include birds, fish, reptiles, amphibians and rare and endangered animal species in wildlife counts to monitor species levels and thus provide an indication of trends of biodiversity levels

1.1.5 Develop a detailed national vegetation map based on most effective technologies, including satellite information and make it easily available through the biodiversity CHM (Ref.9.3.2 - CHM)

1.1.6 With the vegetation map as a base, establish national criteria and guidelines for ecosystems classification and delineation through consultation and peer reviewed process

1.1.7 Classify and map ecosystems at district level according to established national classification criteria and standards.

1.1.8 Produce a national ecosystems map based on the district maps and make the map easily accessible through the biodiversity CHM (Ref 9.3 2– CHM)

Outputs/Products

National focal institutions for hosting biodiversity data assigned
Set of national data collection standards for each group of biodiversity organisms
National survey baseline data and inventories for mammals, birds, fish, flora, reptiles, insects and fungi

- Mechanisms to link data providers with national biodiversity focal centres
- National vegetation map
- National criteria for ecosystems classification
- District ecosystems maps
- National ecosystems map
- Ecosystems map available to the public through CHM

1.2 National biodiversity reference collections established for key groups

Justification
National reference collections are currently not complete and collections are scattered between various institutions and not always satisfactorily curated. Reference collections are essential for identification purposes, and could in some cases be used for provenance testing, i.e. to determine the origins of a specific organism or sample. Due to limited manpower and expertise, it is suggested that collections focus on vertebrates and plants to start with. Regional and international collaborations should be considered for other groups, such as invertebrates and micro-organisms and insects, where national expertise and infrastructure is limited. (See Chapter 10 – Regional context)

Actions to achieve target

1.2.1 Identify and prioritise target taxa and areas according to established criteria for vertebrates and plants.
1.2.2 Appoint/Establish national centres of excellence with responsibility for collecting, housing and curating national *ex situ* and *in situ* collections and reference collections (link with data depository in 1.1.1)
1.2.3 Undertake large scale/multiple site collections of identified target taxa to strengthen national reference collections
1.2.4 Actively curate collections to maintain quality

Outputs/Products
- Target taxa priority list
- National focal centres for biodiversity collections established and equipped to carry out task
- National reference collections for key biodiversity groups established
- High quality collections for conservation and reference.

1.3 A focused biodiversity research programme aimed at establishing biodiversity trends, understanding ecological processes and finding suitable biodiversity management solutions.

Justification
Botswana has relatively good environmental and ecological research capacity, but research capacity is lacking in the fields of botany, microbiology and biosystematics. A focused biodiversity research programme will help ensure efficient use of funds and infrastructure and lead to improved understanding of biodiversity and ecological processes. Formal and informal links with research institutions outside of Botswana should be encouraged in those fields where there is limited national research capacity.

Long-term monitoring of biodiversity is necessary to establish trends in biological resources, to understand the ecological processes, and to determine the sustainability of any activity using components of biodiversity or in other ways affecting biodiversity. Consistent long-term monitoring of biodiversity and ecosystems requires easily measurable indicators and permanent monitoring sites.

Secure funding is a prerequisite for long-term ecological research and monitoring.

Actions to achieve target

1.3.1 Improve efficiency in allocating research permits and decentralise the monitoring of permits and collection of research results for better efficiency (Ref.- 9.4.1 – collection of research reports) Link permits with the requirement to use national data collection standards, (Ref 1.1.2 – data standards), to ensure compatible data and with legal and biosafety requirements for moving organisms (Ref 4.3.- legal framework)
1.3.2 Review the Research Act and update taking the recommendations from the BSAP into consideration.
1.3.3 Establish a biodiversity research fund
1.3.4 Establish biodiversity priority research topics for the fund, including under-represented taxa, species with genetic centres in Botswana, understanding of ecological processes and ecosystems management including carrying capacities, to guide allocation of funds.
1.3.5 Encourage cooperation and partnership development between Government, NGOs, communities, the private sector and regional and international institutions in biodiversity research through funding
1.3.6 Move towards setting of indicators for biodiversity and ecosystem functioning taking cognisance of regional and international standards, and establish carrying capacity levels for livestock and larger wildlife groups.
1.3.7 Based on the above indicators, design compatible national and district level monitoring systems of biodiversity and ecosystem function, and assign responsibility for monitoring, including user based monitoring where relevant
1.3.8 Develop training packages for user-based monitoring by communities and other biodiversity users
1.3.9 Analyse monitoring data at appropriate spatial and temporal scales, establish trends, and use to establish national conservation priorities.
1.3.10 Disseminate status and trends to planners, managers and decision makers through progress reports and link with the State Of the Environment reporting

Outputs/Products

- Compatible research data
- Updated Research Act
- Biodiversity research fund, priority research areas, and guidelines for disbursal of funds established.
- Increased number of private sector and NGO managed biodiversity programmes
- Private Sector and NGO representation in technical expert groups
- National Biodiversity indicators and land carrying capacity established
- Priority groups and taxa for conservation, including RDL species and endemics, identified
- National and District biodiversity monitoring systems in place
- Community and user based monitoring systems linked with district and national biodiversity monitoring systems
- Biodiversity monitoring training packages
- National biodiversity status and trends regularly included in State of the Environment Report.

1.4 Better understanding of the effects of socio-economic issues on biodiversity conservation

Justification

Socio-economic issues and biodiversity conservation are closely linked. Demographic change and urbanisation will affect resource use in an area, including water extraction and harvesting of fuel wood. Demographic changes and health issues, including HIV/AIDS, affect the workforce and in turn capacity to carry out biodiversity conservation and management activities. They also have implications on the preservation of indigenous knowledge and traditional methods.

In addition, the economic climate and poverty levels will influence the choice, or lack of choice, in terms of land use and land use practices. Understanding the relationship between people and biodiversity conservation is therefore essential for sustainable biodiversity management.

Activities to achieve targets

1.4.1 Evaluate the impact of HIV/AIDS on future biodiversity management and conservation

capacity

1.4.2 Evaluate the impact of demographic change on future biodiversity management, preservation of traditional methods, varieties and indigenous knowledge.

1.4.3 Analyse of the economic and cultural importance of livestock and veldproducts to individual Batswana to guide national planning and provision of livelihood alternatives.

Outputs/Products

- Policy briefs on the socio-economic long-term effects on biodiversity conservation for management planning purposes including a review on HIV/ AIDS
- Demographic projections by district and employment sector, and their effects on biodiversity and Indigenous Knowledge Systems (IKS)
- Policy briefs on the importance, to the individual and the nation, of the livestock and veld product sectors to guide macro economic and land use planning

OBJECTIVE 2

LONG-TERM CONSERVATION AND MANAGEMENT OF BOTSWANA'S BIOLOGICAL DIVERSITY

WHY

"The Government of Botswana is responsible for ensuring that its natural resources are harnessed for the benefit of future generations", according to the National Conservation Strategy. While this strategy recognises the immense value of Botswana's natural resource base, and the need for conserving it, pinpointing important components of biodiversity such as wildlife, wood, veld and rangeland resources, it does not however specifically address other groups of organisms, agro biodiversity or whole ecosystems. For successful long-term conservation of biological resources it is important to have a holistic view and the CBD is advocating for countries to adopt more of an ecosystems approach. In this respect, the BSAP adds and complements the NCS.

With limited resources conservation activities need to be prioritised, and activities to do so form an important part of the BSAP. Of special importance are the endemic species, as according to the Convention on Biological Diversity, Botswana is the custodian of these species with responsibility for their survival.

Very little is known about the genetic diversity of wild plants and animals. However, within the timeframe of the strategy and action plan there is not enough time or resources to address wildlife and wild plant genetic diversity and conservation efforts should focus on ecosystems and species conservation, aiming at making sure that populations and habitats are large enough for the survival of the species. Maintenance of genetic diversity is however an important part of the conservation of agrobiodiversity, and needs to be recorded and collected.There are already many successful conservation activities ongoing in Botswana. The strategic targets presented here have therefore been designed to complement and add to on-going conservation activities.

WHAT DOES NDP 9 SAY?

Environmental protection is one of the policy thrusts of NDP 9, as mentioned in the foreword

Paragraph 2.29 states that "All sections of the population depend on the country's resources, namely climate, fuel-wood, veld products, wildlife, land, water and air. The loss through depletion, degradation of these resources also affects everyone, particularly the poor.

Paragraph 13.42 says that wildlife conservation and protection will continue to be given attention during NDP 9 as well as trying to find ways and means of addressing any merging conflicts in order to mitigate negative impacts.

In addition Paragraph 10.34 emphasizes the importance of the forests and woodlands and the need to foster sustainable utilisation of these resources.

WHAT DOES NCS SAY

Paragraph 2.1.1 says that "The Government of Botswana is responsible at all times for ensuring that the natural resources are harnessed for the benefit of future generations."

While the NCS puts special emphasis on conservation of rangeland, wood, veld and wildlife resources its "counterpart goals" also include:

a. the conservation of all main ecosystems, wildlife and cultural resources
b. Protection of endangered species
c. The cost-effective restoration of degraded renewable natural resources

Objective 2 - Strategic objectives overview

2.1	Conservation efforts prioritised at national, district and local levels
2.2	Comprehensive protected area network to conserve ecosystems and species
2.3	Effective ecosystems management practices in place
2.4	Needs of species, in particular threatened and endemic species addressed.
2.5	Effective management systems for economically important non-domesticated species in place
2.6	Conservation of agricultural biodiversity
2.7	Development and implementation of methods for appropriate rehabilitation and restoration of degraded ecosystems
2.8	Indigenous knowledge recorded and conserved

Strategic targets details

2.1 Conservation efforts prioritised at national, district and levels

Justification

Limited resources for conservation require prioritisation of efforts and financial resources. Scientifically based criteria for priority setting of conservation efforts will maximize the conservation benefits to costs ratio. The NCS lists the main conservation strategy issues as:

- Rangeland and pasture degradation
- Depletion of wood resources
- Overuse of veld products
- Pressure on water resources
- Industrial and urban pollution

These areas are also included in the BSAP stock take report as issues needing to be addressed. The BSAP has indicated areas of conservation priority at a national level, but as the levels of biodiversity threats vary from place to place and consequently the conservation needs, a finer scale district level assessment is needed for efficient prioritisation. The regional context should also be taken into consideration when setting priorities

Actions needed to achieve target

2.1.1 Develop national and district criteria for conservation priority setting, including cost benefit analysis (Ref 4.6 – Economic valuing of ecosystems)

2.1.2 Develop guidelines and framework for development of district level BSAPs , based on the national BSAP

2.1.3 Prepare Biodiversity and Conservation Strategies and Action Plans for all 10 districts

Products

- Set of criteria for conservation priority setting
- District BSAP guidelines
- District BSAPs

2.2 Comprehensive protected area network to conserve ecosystems and species

Justification
Latest research and the CBD advocate adoption of a more holistic approach to conservation, i.e. conservation of whole ecosystems or habitats, complemented by species and genetic conservation measures.

According to the BSAP Stock take report, there are still some gaps in the current protected area network in Botswana, with some biodiversity rich areas and important species, such as many of the RD plant species currently not covered by the protected area network.

While making the protected area network more comprehensive in geographical terms, it is also important to make sure that the network includes migratory routes and that the areas set aside for conservation are large enough to support genetic diversity and evolutionary processes.

Actions needed to achieve target

2.2.1 Identify major gaps in protected area network through national and district BSAPs, and national inventories

2.2.2 Taking district BSAPs and RD species into consideration, amend protected area network, including national monuments, to make it comprehensive, addressing critical connections between national and regional protected area networks and all major biodiversity groups

2.2.3 Establish Important Plant Areas (IPAs) according to international standards and link these and Important Bird Areas (IBAs) into protected area network

Outputs/Products

- Comprehensive protected area network
- Important Plant Areas established

2.3 Effective ecosystems management practices in place

Justification
Designation of protected areas is not enough to provide effective conservation of biodiversity and the health of ecosystems. Appropriate management systems are needed as well. For effective conservation it is important not to limit *in situ* conservation measures to protected areas, but to promote and provide incentives for conservation outside these areas as well. Livestock/wildlife conflict, including access to grazing and water, is a real issue around protected areas which needs to be addressed to ensure long-term conservation of wildlife and the natural vegetation

While there is a natural fluctuation in species numbers in natural ecosystems, carrying capacity levels should be taken into consideration if one species threatens to drastically change biodiversity levels in the short term.

Consultative and participatory approaches to biodiversity conservation, which are decentralized will have the greatest impact on long-term biodiversity conservation and more clearly represent societal choice.

Actions needed to achieve target

2.3.1 Strengthen the mandate and efficiency of the CBNRM Technical Advisory Committees (TACs).

2.3.2 Review current national and regional land management systems (including rangeland and fire management practices) and land uses in terms of effectiveness in biodiversity

conservation, identifying weaknesses, strengths and best practices (Ref 10.3.6 – Regional best practices), and scope for increased community involvement in conservation activities (Ref. 3.3 – Involving communities)

2.3.3 Identify institutional capacity gaps (with special focus on the extension services) with regards to ecosystems management, and strengthen if necessary to enhance ecosystem management capacity

2.3.4 Seek and secure funding for effective long-term ecosystems management (Ref 4.6 – financial mechanisms)

2.3.5 Encourage conservation measures in designated Wildlife Management Areas (WMA)and areas bordering the protected areas through incentives and education

2.3.6 Research conservation and land-use conflict, and put research results into practice through incentives and policy framework to reduce conflict areas.

Outputs/Products

- TAC ToRs
- Strengthened and active TACs
- Guidelines on effective biodiversity land management
- Improved institutional land-use and management capacity, including the extension services
- Incentives (efficient compensation etc.) and education programme for conservation activities outside the protected area network.
- Land-use conflict management recommendations based on research
- Incentives to limit wildlife/livestock conflict

2.4 Needs of species, in particular threatened and endemic species addressed.

Justification

Many species and groups of organisms in Botswana are still data deficient and their conservation status is not known. To guide prioritisation of conservation activities, Red Data Lists (RDL) should be drawn up for animal and plant species. To be effective, the RD lists need regular review and updating. Red Data species, endemic species and other vulnerable species are likely to need additional protection both legally, controlling access and use, and from a conservation point of view, through specific management plans and *in situ* and *ex situ* conservation measures.

Under the Convention on Biological Diversity, Botswana has sole responsibility for conserving and maintaining all endemic species.

Actions needed to achieve targets

2.4.1 Establish conservation status and develop National Red Data Lists for all major animal and plant taxa in Botswana and develop mechanisms for biannual updating processes

2.4.2 Develop and implement management and recovery plans for priority taxa, including RD species

2.4.3 Support and promote *in situ* and *ex situ* conservation activities for rare, threatened and endemic species

Outputs/Products

- Up to date Red Data Lists for animal and plantl resources
- Recovery plans for all RD taxa including ex situ and in situ conservation developed and implemented

2.5 Effective management systems for non-domesticated economically important species (veldproducts) in place

Justification

Species with economic potential, such as certain veldproducts, medicinal plants, rare and endangered and "collectible' species, are especially under threat from unsustainable harvesting and poaching. Scientifically based harvesting protocols and levels, together with resource monitoring systems and appropriate enforcement are therefore essential to maintain species levels.

Actions needed to achieve target

2.5.1 Undertake inventories of the key traded (medicinal, food and collectible) animal and plant species, identify species of economic value and assess conservation status and level of protection required

2.5.2 Develop propagation and harvesting protocols for key animal and plant species with commercial value which are under potential threat from over-harvesting and encourage domestication and cultivation

Outputs/Products

- Veldproduct inventory
- Propagation and harvesting protocols for selected economic species
- Propagation and cultivation of selected veldproducts and RD plant species if appropriate

2.6 Conservation of agricultural biodiversity

Justification

Maintaining agro biodiversity, including genetic diversity, provides options for the future in terms of traits and characteristics. Traditional strains of livestock and crop landraces are slowly being eroded in Botswana. It is important not to lose the genetic information harboured by these strains and breeds, as they could provide important traits in future breeding programmes, and conservation programmes for maintaining agro biodiversity need to be put in place.

Agro biodiversity also provides food security at national level and is part of traditional management systems, thus providing traditional and cultural links with the past.

Actions to achieve targets

2.6.1 Determine availability and distribution of agro biodiversity in Botswana and identify farming systems which sustain high diversity as well as the human resource base needed to maintaining agro biodiversity

2.6.2 Based on the above, establish a national agro biodiversity database containing distribution of species, varieties and strains available in the country and conservation status and make provisions for regular updates

2.6.3 Design and implement a collecting programme for long-term *ex situ* preservation of agro biodiversity.

2.6.4 Continue characterisation, research potential and use (breeding, genes for biotechnology) focusing on the groups which have genetic centres in Botswana (Ref 8.4 Bio-prospecting)

2.6.5 Based on 2.6.1, develop models and approaches, which promote a living landscape, and *in situ* preservation of agro biodiversity at species and genotype levels. Subsequently, actively promote and support the adoption and implementation of biodiversity-friendly farming systems

2.6.6 Involve communities in *in situ* conservation of agro biodiversity and encourage the inclusion of indigenous knowledge systems into farming systems

2.6.7 Develop mechanisms for the protection of plant breeders' rights, including landraces, linked with IPR

Outputs/Products

- Updated national agro biodiversity database
- Germ plasm collections
- Inventory of germ plasm characteristics
- *In situ* conservation of agro biodiversity and traditional practices
- Plant breeding rights covered under IPR

2.7 Rehabilitation and restoration of degraded ecosystems and habitats

Justification

To encourage rehabilitation and restoration of degraded ecosystems and habitats, it is important that "easy to use" guidelines and appropriate plant material are easily available. Restoration of habitats is

usually very expensive and prevention of unnecessary destruction cause by development and other activities should be the main aim.

The rangelands of the Kalahari serve as a biodiversity reservoir for a number of plants and animal species. However, due to over-utilisation, large areas are slowly turning into monocultures through the proliferation of opportunistic indigenous plant (bush encroachment) and animal species resulting in reduced biomass and ecosystem services. A shift to more appropriate land-use practices and active rehabilitation of degraded rangelands are of key environmental importance to Botswana, and also identified as one of five key targets in the NCS

Strategies for reducing mismanagement of biodiversity and ecosystems include linking access to resources and land-use rights with the responsibility for restoration if mismanaged (Ref 7.2 – Linking access with responsibility).

Actions to achieve targets

2.7.1 Develop easy to use guidelines on the principles of rehabilitation and restoration for various sectors (Ref 6.2 – promotion of indigenous plants)

2.7.2 Develop cost calculations for restoration and rehabilitation of destroyed habitats and include in EIA cost benefit analysis (Ref. 4.6 – economic valuation)

2.7.3 Intensify measures to rehabilitate degraded rangelands. District authorities to set targets.

2.7.4 Introduce a system linking land-use rights with the responsibility for rehabilitation and restoration if appropriate and structures for enforcement (Ref. 7.2 – Linking access with responsibility) For example, develop biodiversity damage compensation and charge system to land uses with adverse biodiversity impacts (Biodiversity impacts internalised)

Outputs/Products

- Easy to use guidelines on habitat restoration
- Habitat restoration and rehabilitation cost estimates
- Rehabilitated rangelands
- Responsibility for rehabilitation included in land allocation contracts
- Biodiversity damage compensation and charge system

2.8 Indigenous knowledge recorded and conserved

Justification

Traditional learning and knowledge, and appreciation of cultural taboos and spiritual values are not only part of the cultural heritage but may contribute to the conservation and sustainable use of the country's biological resources. Indigenous knowledge of medicinal uses of biodiversity may also provide ideas and solutions for future medical research.

With demographic changes and development the youth are less interested in absorbing traditional knowledge and practices. Initiation schools are disappearing and school curricula currently do not include traditional knowledge and practices. Unless the information is recorded, it will only take a couple of generations for it to disappear. Indigenous knowledge is closely linked to Intellectual Property Rights and measures must therefore be taken to ensure that the information is not misused. On the other hand, recorded knowledge can also help establish Intellectual Property Rights (See also targets 3.3; 3.8; 4.3; and 6.1 use of indigenous knowledge, agro biodiversity, legal framework and awareness of indigenous knowledge.

Actions to achieve targets

2.8.1 Establish legal and financial principles and procedures for collecting and disseminating indigenous knowledge, i.e. indigenous knowledge policy (Ref 4.3 – legal framework)

2.8.2 Establish responsibility for collection and storage of indigenous knowledge (depository)and when Intellectual Property Rights (IPR) legislation is in place (Ref 4.3 – legal framework), collect and record indigenous knowledge

2.8.3 Preserve local knowledge of medicinal plants and encourage the transfer of knowledge through , for example, school market gardens and medicinal plant displays in botanical gardens (Ref 6.1 – awareness)

Outputs/Products

- Indigenous Knowledge policy, including legal and financial collecting and recording principles
- Formation of a depository of Indigenous Knowledge
- Record of local practices and indigenous knowledge
- Record of medicinal properties of local plants
- Medicinal plant displays for education

OBJECTIVE 3

SUSTAINABLE UTILISATION OF ALL COMPONENTS OF BIODIVERSITY IN BOTSWANA THROUGH APPROPRIATE LAND AND RESOURCE USE PRACTICES AND MANAGEMENT

WHY

Sustainable use of biological resources is the key to development. The nation's wealth is built on its natural resources. The current population of Botswana are custodians of this natural heritage, and it is the responsibility of this generation to make sure that we don't erode the capital we have been given, leaving our children and grand-children the same resources that we were given.

Botswana is an arid country and the dependency on rainfall renders many of the ecosystems vulnerable to climatic variation and changes. Precautionary and adaptive management procedures are therefore extremely important. Sustainable use of components of biodiversity requires a combination of legal, policy and economic incentives, a change in attitudes, i.e. a realisation of the value of biodiversity (See objective 6), education and providing people with sustainable livelihoods opportunities and options.

WHAT DOES NDP 9 SAY?

The theme of NDP 9 is "Towards realisation of Vision 2016: Sustainable and diversified development through competitiveness in global markets.

Paragraph 10.106 further states that "the depletion of natural resources affects sustainability of life systems. Thus there is a need to pay attention to their management"

WHAT DOES NCS SAY

The NCS is founded on the principle and concept of sustainable development, commonly defined as "development that meets the needs of the present generation without compromising the ability of future generations to meet their needs

The policy goals of the NCS are to:

a. increase the effectiveness with which natural resources are used and managed;
b. integrate the work of the many sectoral ministries and interest groups, so that all developments based on natural resources provide sustainable yields, minimizing environmental/social costs and satisfying restoration/conservation needs
c. ensure that future generation have access to capital stocks of natural resources, at least equal to those presently available

Objective 3 - Strategic targets overview

3.1	Biodiversity concerns and essential ecological processes adequately incorporated into national and district land use and resource planning processes.
3.2	Identification and promotion of biodiversity compatible land and resource uses, including tourism (Ref. 2.6.5)
3.3	Increased levels of community participation and use of indigenous knowledge systems in land use and sustainable management processes
3.4	Sustainable use of fuelwood and forest resources.
3.5	Rangeland/dryland biodiversity maintained through promotion of sustainable use of natural rangelands for economic growth and ecological balance
3.6	Sustainable use of wetlands ecosystems, biodiversity and ecological processes
3.7	Sustainable use of wildlife resources and wild plants
3.8	Sustainable use of agricultural biodiversity
3.9	Sustainable and efficient use and trade in veldproducts for maximum economic and livelihoods benefits

Strategic targets details

3.1 Biodiversity concerns and essential ecological processes adequately incorporated into national land use and resource planning processes.

Justification

Although Botswana is a large country with a relatively small population, competition for "good" land is still an issue and in the competition for land, biodiversity conservation purposes often lose out to development and commercial use. Unsuitable or unsustainable land use may erode ecosystem function and services, and limit future options. Appropriate land use planning, including adequate protection of important ecosystems, is therefore essential for the future well-being of the nation.

Actions required to achieve target

3.1.1 Institutionalise the operational guidelines of the ecosystem approach and the BSAP into resource management and sustainable land use strategies at all levels in institutions concerned with policy, planning, conservation and management of biological resources, through a). Adaptation of guidelines and planning manuals; b) Preparations of information materials c) Training of staff (Sec 4.4 – capacity building)

3.1.2 Integrate biodiversity concerns into Strategic Environmental Assessment (SEA) guidelines and carry out SEAs for major policies and programmes

3.1.3 Include biodiversity consideration into national audits and accounts (Ref 5.7.1 – cost of pollution; 4.6 – environmental costs).

3.1.4 Designate appropriate areas for biodiversity conservation, including wildlife corridors, making allowances for migration routes and other species requirements as appropriate and gazette (e.g. WMAs). (Ref. 2.3.5; 2.2)

Output/Products:

Updated Planner's Manuals
Ecosystems guidelines for planning
Strategic Environmental Assessment (SEA) for all policies and strategies affecting the management of biodiversity
Environmental cost column in national accounts
Additional conservation areas established, including wildlife corridors, according to need, including migratory routes, and existing land allocated as WMAs gazetted according to demand

3.2 Identification and promotion of biodiversity compatible land and resource uses.

Justification
Appropriate land-use management will contribute to more efficient biodiversity use and conservation of resources. Biodiversity and pristine ecosystems provide much of the base for the tourism industry in Botswana, and an integrated approach to tourism and biodiversity management will benefit both sectors (Ref. 2.6.5).

Actions required to achieve targets
3.2.1 Evaluate the impact of different land management policies on biodiversity conservation
3.2.2 Develop land use best practices guidelines and consider creation of incentives for appropriate land-uses, taking regional CBNRM experiences into consideration (Ref 4.1.2 – Review of policies and incentives).
3.2.3 Investigate tourism potential in support of biodiversity and landscape conservation and promote set up conservation partnerships where relevant.
3.2.4 Promote integrated landscape planning, with priority given to around protected areas and urban areas

Outputs/Products
- Land use best practice guidelines
- Ecotourism plans
- Integrated landscape plans
- Report on the effects of land management policies

3.3 Increased levels of community participation and use of indigenous knowledge systems in land use and sustainable management processes

Justification
Consultative and participatory approaches to biodiversity conservation will have the greatest impact on long-term biodiversity conservation, and more clearly represent societal choice – thus have greater support from communities and other custodians of biodiversity. Indigenous management processes already exist, but are not always considered. Increased benefit sharing and participation in resource management will help to ensure a sense of ownership and commitment to biodiversity conservation.

Actions required to achieve targets
3.3.1 Diversify (geographically and based on natural resource use) and strengthen support to CBNRM (Ref.6.5 – involvement of communities and NGOs)
3.3.2 Re-establish effective Common Property Resources (CPR) regimes, including access to communal resources, and develop a plan for implementation of Community Based Strategies
3.3.3 Integrate poverty alleviation measures, in accordance with the Millennium Poverty Reduction Target and Vision 2016, into biodiversity conservation policies and programmes
3.3.4 Strengthen mechanisms to allow communities to engage effectively in policy dialogue, planning, design and management of natural resources and biodiversity in community areas, and thereby allow for inclusion of indigenous knowledge systems and traditional practices (Ref 6.5 – involvement of communities and NGOs).
3.3.5 Strengthen the capacity of NGO and Community Based Organisations (CBOs) in sustainable biodiversity use and management through human resources development

Outputs/Products
- CBNRM programme expanded
- Implementation plans for community based strategies
- Combined Biodiversity conservation and Antipoverty programmes
- Improved CBO and NGO capacity in sustainable land use and biodiversity management

3.4 Sustainable use of fuel wood and forest resources.

Justification
Land clearing and unsustainable fuel wood harvesting or logging will lead to decline in forest and woodland vigour, diversity, and actual area. There are already signs of emerging deforestation in Southeast Botswana due to unsustainable levels of fuel wood collection. Alternative energy sources and fuel wood management practices already exist, but a coordinated approach to the use of energy resources is needed to achieve maximum impact.

Actions needed to achieve target
3.4.1 Update and approve the Forestry Policy and subsequently the Forestry Act
3.4.2 Based on the updated Forestry Act establish enforcement mechanisms.
3.4.3 Update the biomass inventory and assess forestry biodiversity trends and patterns
3.4.4 Identify and introduce alternative energy sources through a) Inventory of available alternatives; b) evaluation of alternatives; c) financial incentives introduced for environmentally friendly energy sources; d) Information campaign
3.4.5 Promote and establish network of fuel wood plantations and community woodlots using indigenous species in all 10 districts
3.4.6 Develop Forest Reserve Management Plans

Outputs/Products
- Updated Forestry policy and Forestry Act
- Updated biomass inventory
- Financial incentives for environmentally friendly energy sources
- Inventory of alternative energy resource
- Effective energy use information campaigns
- Fuelwood plantations
- Management plans for all forest reserves

3.5 Rangeland/dryland biodiversity maintained through promotion of sustainable use of natural rangelands for economic growth and ecological balance

Justification
Poor rangeland management, i.e. overstocking and heavy grazing lead to land degradation, species substitution, and long-term decline in land productivity and biodiversity levels. Much work has already been done in the area of rangeland management, but rangeland degradation and negative impacts on the natural vegetation is still a major problem in many parts of Botswana and interventions to reduce and reverse rangeland degradation is therefore needed.

Actions needed to achieve target
3.5.1 Survey rangeland biodiversity (ref Indigenous Vegetation Project and BRIMP) and continue rangeland monitoring, including bush encroachment, allocation and use of water points, stocking and grazing levels, donkey population, fire etc.
3.5.2 Continue extension on rangeland management including conservation measures, stocking rates and alternative uses such as game farming to encourage sustainable use
3.5.3 Review the Tribal Grazing Land Policy and other legal and policy instruments related to grazing rights and the use of communal land
3.5.4 Complete gazetting of Wildlife Management Areas (WMAs), grazing areas and mixed farming areas, and develop and implement Management plans.
3.5.5 Introduce and implement appropriate water charges - Ref 5.5 - Water
3.5.6 Provide incentives to reduce overgrazing and to restore rangeland degradation, as per the recommendations in the National Conservation Strategy and recommendations by the Indigenous Vegetation Project (4.1 – policies and 4.6 – Charges))
3.5.7 Encourage and promote schemes to clear and utilise bush encroachment, and link with the search for alternative energy sources (3.4.4 – inventory of alternative fuel sources) and community participation in conservation (Ref. 3.3).

Outputs/Products
- Up to date BRIMP data
- Extension to improve rangeland practices
- Adjustment to TGLP
- All WMAs gazetted
- Grazing areas and mixed farming areas gazetted
- Water charges in place and collected
- Specific programmes and incentives aimed t reducing over-grazing and rangeland degradation.

3.6 Sustainable use of wetlands ecosystems, biodiversity and ecological processes

Justification
Botswana's wetlands are unique, both from a global and national perspective. Maintenance of wetlands ecosystem function is critical to the long-term viability of these systems, biodiversity conservation and societal needs. Threats to wetlands include hydrological change, Invasive Alien Species (IAS), climate change, unsustainable use and pollution. Prevention is always much cheaper than cure and appropriate management of Botswana's wetlands will be cost effective in the long term.

Actions needed to achieve target

3.6.1 Approve wetland policy and start implementation

3.6.2 Implement wetland management strategy making provisions for increased community participation in wetlands management and planning, and give special consideration to issues of access

3.6.3 Continue implementation of the Ramsar Convention on Wetlands and wetland management plans

3.6.4 Enhance national capacity for wetlands management, protection regulation and enforcement and integrate the principles of ecological water needs in planning and implementation

3.6.5 Strengthen regional river basin management collaboration

Outputs/Products
- Official Wetlands policy
- Implementation of wetlands management strategy
- Implementation of Ramsar, Okavango (ODMP) and Makgadikgadi management plans
- Improved wetland management capacity
- Transboundary river basin management collaboration programmes

3.7 Sustainable use of wildlife, wild plants and other biological resources

Justification
Botswana's biological heritage is a resource capital, which needs to be managed properly for optimum profit: economic, social and biological. The ecosystems and species not only sustain ecological processes, vital for humankind, but also provide the resource base for a large part of the tourism industry in Botswana, sources for alternative livelihoods (veldproducts) and genetic potential for the future.

Although there are still gaps in population and distribution data for all components of biodiversity, there is enough evidence to show that populations of some species (e.g. Springbok) are decreasing, while others, such as elephants and some tree species, including *Acacia mellifera* and *Dicrostachys cinerea* are on the increase, and have in some cases reached levels which are now threatening other components of biodiversity. A coordinated and coherent management approach, which takes wildlife conflict issues and rights and access to biodiversity resources into consideration, is essential to achieve long-term sustainability.

Actions needed to achieve target

3.7.1 Develop a comprehensive strategy and programme for sustainable use of wildlife resources including setting of quotas, monitoring or resources (Ref. 1.3.7 and 1.3.8 – National and community monitoring of resources) and strengthening of enforcement capacity at the national level

3.7.2 Assess current intervention strategies for community livelihood loss due to wildlife conflict and promote farming systems which minimise wildlife conflict through the extension services, and strengthen the effectiveness of these programmes in consultation with affected communities (Ref 2.3.6 – Reduction of land-use conflicts)

3.7.3 Develop community capacity to utilize natural resources in income generating activities and to secure access for sustainable use strategies (Ref 3.3.5 - Capacity; Objective 7- Access and benefits)

3.7.4 Provide communities and individual with livelihoods options through assisting with assessment of potential markets for the sale of natural resource products and facilitated access through credit and enterprise schemes, while linking with quality control and resource allocation permits as appropriate (Ref 6.6.2 – Women's credit schemes; 3.9.2 - Veldproducts

3.7.5 Develop code of conduct for traditional healers and users of medicinal species (7.3.2 - IKS)

Outputs/Products

- Wildlife resource use programme/strategy
- Wildlife conflict solutions including alternative farming systems and livelihoods options
- Incentives to prevent livestock-wildlife conflict
- Code of conduct for traditional healers

3.8 Sustainable use of agricultural biodiversity

Justification

Agro biodiversity is an important source of genetic material, providing a buffer and options for adaptation to changing conditions. Modern agricultural practices favouring monocultures and the use of exotic varieties, breeds and hybrids, increase Botswana's vulnerability to widespread crop failure through for example diseases, drought and frosts. The current trend in Botswana is that indigenous varieties, landraces, strains and species, together with their genetic potential, are slowly disappearing.

Botswana is the centre of diversity for *Vigna spp* (Cowpeas) and a secondary centre of diversity for *Citrullus spp* (melons) (Mathodi, S. M., 1992) and thus harbours an invaluable gene-pool for these two species, which needs to be preserved.

Actions needed to achieve target

3.8.1 Implement programme and strategy for maintenance of agro biodiversity (breeds and strains) and identify and promote best practices (Ref 2.7 – Use of indigenous species in habitat restoration)

3.8.2 Create awareness about the value of genetic diversity and locally adapted breeds and promote indigenous farming systems which encourage high diversity (Ref. 2.6 – Conservation of agro biodiversity)

3.8.3 Improve availability of traditional and improved seed varieties and breeding materials to smallholder and other farmers.

3.8.4 Review Government seed distribution/drought relief and encourage distribution of more traditional varieties.

3.8.5 Encourage the uses of traditional varieties and strains/breeds of livestock and crops for special uses for the development and support of niche markets that will in turn encourage individuals, communities and institutions take interest in availability of the propagation materials.

3.8.6 Educate farmers about the benefits and risks of Genetically Modified Organisms, integrated pest management and the pros and cons of hybrid and improved varieties versus land races and traditional varieties (Ref 5.6 – threats to biodiversity; 8.2.3 – GMO guidelines)

Outputs/Products

- Directory of best agro biodiversity practices
- Programmes to promote agro biodiversity
- Wider choice and availability of seed and breeding material

- Increased use of traditional varieties and strains/breed of crops and livestock, and traditional varieties included in seed distribution and drought relief
- Farmers aware of risks and rewards related various types of seeds and of integrated pest management

3.9 Sustainable and efficient use and trade in veldproducts for maximum economic and livelihoods benefits

Justification

Poverty and lack of alternative livelihoods cause some communities to rely heavily on natural resources, putting these under pressure. In the absence of proper management regimes and known sustainable harvesting levels any increase in use and other pressure factors may affect the sustainable utilisation of these resources.

While some economically important species, such as *Hoodia currorii, Terfizia pfielii (Kalahari truffle)* are potentially under threat from over harvesting, others are probably currently being under-utilised. Current quota and resource allocation do not guarantee sustainability and do not lead to economically optimal resource use.

Actions required to achieve aim

3.9.1 Develop and approve veld product policy

3.9.2 Decentralise harvest allocations of non-threatened species to a multidisciplinary team chaired by the Tribal Authority (Chiefs) and provide them with the necessary tools and guidelines to ensure sustainable use and transparency and accountability in the allocation process. National control should be maintained over the RD species and species threatened by overexploitation.

3.9.3 Extend the Agricultural Resources Board (ARB) veld product monitoring system to include models for quota setting, carrying capacity guidelines, monitoring and enforcement capacity in local and national resource users, organisations and regulatory agencies

3.9.4 Identify enterprise development opportunities and alternatives in community based natural resources and conduct product feasibility studies and market assessments to form the basis for viable industries, taking the regional context into consideration (Ref 3.7.4 – Use of natural resources; 3.9.8 – craft centres; 6.6.2 – Women's credit schemes).

3.9.5 Facilitate access through credit and enterprise schemes, while linking with quality control and resource allocation permits as appropriate (Ref 3.7.4 – Use of natural resources, 10.3 - Regional markets, 6.6.2 – Women's credit schemes Object 7 – Access and benefit-sharing)

3.9.6 Introduce regulated tendering for commercial resource rights, taking precautions not to dis-empower poorer households.

3.9.7 Expand Natural Resources Allocation (NRA) programme to wildlife, rangelands and key veldproducts

3.9.8 Support the setting up of commercial village craft centres and let prices be determined by the forces of supply and demand at these centres (Ref 3.9.4 – market opportunities and credit schemes)

Outputs/products

- Veldproduct policy
- Guidelines on harvest allocation aimed at Tribal Authorities
- Veldproduct monitoring system and standards in place
- Veldproduct harvesting protocols and models for quota setting for the veldproducts threatened by overuse
- Product and market feasibility reports for veldproducts with commercial potential
- Start up credit schemes for small biodiversity based businesses
- System and guidelines for tender of commercial resource rights
- Village craft centres

OBJECTIVE 4

AN INSTITUTIONAL ENVIRONMENT, INCLUDING FINANCIAL AND HUMAN CAPACITY, CONDUCIVE TO EFFECTIVE BIODIVERSITY CONSERVATION, SUSTAINABLE USE AND MANAGEMENT

WHY

An institutional environment conducive to effective biodiversity conservation, sustainable use and management refers to an institutional climate and set-up which includes cross sectoral coordination, political will, appropriate economic incentives, adequate institutional structures and capacity, and a legal system to support and encourage conservation and sustainable use and management of Botswana's biological resources. There are already many institutional structures in place, but there is still a need for improvements, especially in the fields of planning and coordination, and legislation for the protection of Botswana's genetic resources.

WHAT DOES NDP 9 SAY?

There is a need during NDP 9 to fully integrate environmental issues into development policies, programmes and projects.

During NDP 9 the development of an appropriate legislative framework and the necessary institutional reform to monitor and enforce such legislation will be encouraged (Paragraph 4.29).

Paragraph 14.35 talks about the need to upgrade NCS institutions to meet the cross-sectoral challenges of environmental management during NDP 9. This requires increased cooperation, networking and partnership amongst Government institutions so as to attain sustainable development. Effective operational links are important to foster a continued policy review and reform.

WHAT DOES NCS SAY

Paragraph 4.6.6. states that "The Government intends to introduce an Act, the NCS Act, specifically in support of the Strategy. The need for such an Act derives directly from the importance of providing a comprehensive policy framework for the NCS and through it a vehicle for coordinating all existing policies and subsequent legislation, which relate to the NCS goals and objectives, i.e.:

a. Defining the responsibilities of all those organisations, upon which the success of the NCS depends
b. Making preparations of both EIAs and associated statements mandatory for all public and private developers.
c. Establish an enabling framework for both the provision and coordination of the legal, institutional, manpower and monetary resources required for the effective implementation of the NCS"

Strategic targets overview

4.1	Cross sectoral coordinated approach to national biodiversity conservation and use with roles and responsibilities clearly defined and mechanisms in place to facilitate coordination
4.2	Enhanced institutional biodiversity capacity at all levels for effective planning, research, monitoring and legal enforcement, as identified in the biodiversity training needs assessment
4.3	National *in situ* and *ex situ* conservation capacity strengthened
4.3	Financial mechanisms and finance in place for biodiversity related activities
4.5	Economic valuation of ecosystems and environmental costs developed and utilised for appropriate cost benefit analysis

Strategic targets details

4.1 A cross sectoral coordinated approach to national biodiversity conservation and use with roles and responsibilities clearly defined and mechanisms in place to facilitate coordination

Justification

Biodiversity issues and responsibilities are currently divided among a large number of government institutions, and according to sectoral lines. Fragmentation of efforts can create duplication, competition for funds, general inefficiency and even have negative effects on specific components of biodiversity. A strong biodiversity coordinating body and a framework for coordination is therefore needed.

Actions to achieve targets

4.1.1 While overall national responsibility for biodiversity conservation has been assigned to MEWT, specific roles for various components of biodiversity and management between government, NGOs and the private sector clarified and responsibilities assigned

4.1.2 Review the NCS and other relevant sectoral policies, action plans, incentives, subsidies and other programmes of government ministries, departments and institutions, and NGOs for biodiversity issues, in order to avoid duplication, to harmonise activities and to identify and address perverse incentives and subsidies if necessary

4.1.3 Based on the BSAP, National Conservations Strategy (NCS) and the policy review, develop an integrated strategic policy framework to address cross cutting issues such as decentralisation and local management, incentives and regulatory framework, integration with international conventions, CBD ecosystem approach, threats to biodiversity and measures to mitigate declines in economic activities due to HIV/AIDS

4.1.4 Establish and staff and environmental policy formulation and evaluation unit for inter-sectoral planning and policy formulation, and develop and implement an integrated and inter-sectoral policy framework for sustainable natural resource management and biodiversity conservation

4.1.5 At district level form biodiversity crosscutting committees under the District Development Committees (DDC), linking with the Technical Advisory Committees (TACs) (Ref 2.3.1 – Technical Advisory Committees), with mandate to coordinate biodiversity issues and set up biannual meetings

4.1.6 Coordinated by MEWT, set up permanent task force groups for the various components of biodiversity conservation and management, with representative from all sectors, focusing on various components of biodiversity conservation and management. Use these groups for policy advice and reference and link with Technical Advisory Committees and District Development Committees (Ref 4.1.5 – District Development Committees; 2.3.1 – TAC)

4.1.7 Establish a multi sectoral cross sectoral resource allocation and charge model

4.1.8 Streamline the BSAP into the State of the Environment reporting and other national environmental programmes

Outputs/Products

- Biodiversity roles and responsibilities assigned
- Inter-sectoral policy planning unit and mechanisms to encourage decentralised and inters-sectoral and inter-ministerial planning
- Policy framework conducive to biodiversity conservation and sustainable used
- District cross cutting biodiversity committees
- Biodiversity mainstreamed into the planning process
- Biodiversity task force groups
- Resource allocation models
- BSAP activities included in SOER

4.2 Comprehensive legal framework for the protection of biodiversity with appropriate mechanisms in place for implementation and enforcement

Justification

In line with the NCS, the BSAP Stock take has concluded that existing laws to protect biodiversity are outdated and do not adequately protect biodiversity. Despite the recommendations in the 1991 NCS for a National Conservation Strategy Act, there is still no overarching legal framework covering biodiversity or the environment as a whole. As a result, biodiversity related legal matters usually require interpretation of existing laws. For example, CITES listed plants and some of the economically important veld plants are not covered by any legislation. Import and export regulations mainly cover disease causing organisms and noxious agricultural weeds, but do not address Genetically Modified Organisms (GMOs), and Invasive Alien Species (IAS). The framework for granting research permits does not adequately address movement and access to genetic resources, including potentially valuable micro-organisms. Indigenous knowledge and intellectual property rights are not adequately covered by today's laws, and there is a need for laws to regulate new concepts such as biotechnology. Most importantly, access to resources and benefit-sharing issues are not adequately addressed. This has led to a situation today where there is very little control over the movement and use of Botswana's genetic resources.

The Environmental Impact Assessment Act has been under preparation since 1996, but is still not official. This Act will improve the current situation, but there is still a need to pull in existing laws and regulations addressing component of biodiversity under one umbrella and where necessary amend or complement existing laws.

It is vital to harmonise any new legislation and regulations with regional legislation, aiming to match the most stringent and comprehensive laws.

Legal issues concerning Intellectual Property Rights (IPR) and Indigenous Knowledge (IK) are addressed under Objective 7 – Access and Benefit Sharing

Actions to achieve target

4.2.1 In line with the recommendations of the NCS and the BSAP establish an over-arching National Conservation Act or other omnibus suitable legislation framework to cover the various aspects of environmental issues including biodiversity

4.2.2 Identify gaps in current legislation with regards to national, regional and international standards and needs, relating to biodiversity conservation and sustainable use of biodiversity. Update and complement the legal framework accordingly, while aiming to harmonise laws within the region

4.2.3 Empower all law enforcement organisations and departments to implement the biodiversity legal framework, including related laws, policies and bye-laws (Ref 5.4.3 – enforcement of EIA)

4.2.4 Develop incentive strategies which promote community involvement in enforcement activities

4.2.5 Strengthen and streamline licensing and permit system for import and export of biodiversity components, including for research (Ref 1.3.1 – Research permits), to include transparent mechanisms, printed guidelines and set time/performance targets.

Outputs/Products

- Environmental umbrella act
- List of gaps in current legislation
- Comprehensive legal framework for biodiversity conservation and sustainable use and protection of all components of biodiversity
- Improved enforcement capacity at national, district and local level
- Effective import and export licensing system for biological resources

4.3 Enhanced institutional biodiversity capacity at all levels according to BSAP needs

Justification

Biodiversity is a technical subject and a general understanding of biodiversity related issues is currently limited to a few specialist institutions within government and civil society. In particular government institutions concerned with policy, planning and legislation and extension need to strengthen their understanding of biodiversity issues.

Although Botswana has good environmental and ecological research capacity there are a limited number of trained botanists and scientists engaged in small animal, microbial research and biosystematics (taxonomy), which are essential for identification and understanding of biodiversity. Identification of plant and micro-organism species is currently often done outside the country.

To improve efficiency, avoid duplication and facilitate access to data, the BSAP Stocktake has proposed the establishment of Centres of Excellence or focal organisations for various types of organisms. It is proposed that these institutions, preferably stable government or university institutions, host reference collections and related data.

Actions to achieve target

4.3.1 Establish MEWT/NCSA district offices/officers to improve communication between the national and district levels

4.3.2 Review existing institutional infrastructure and capacity with regards to planning, research, monitoring and legal enforcement in biodiversity conservation and sustainable use (Ref 5.6.8 – Train customs' staff)

4.3.3 Appoint and establish national or regional, if relevant) centres of excellence for biodiversity key groups (invertebrates, flora, birds fungi, micro-organisms etc. Responsibility for wildlife has already been established through DWNP), clarifying institutional responsibilities and draw up TORs to include establishment and curation of national biodiversity collections. Mechanisms for depository of data, and hosting of data etc (Ref. 9.3.1 – Access to data; 1.2.2. – Housing of data and reference collections).

4.3.4 Strengthen the Agricultural Resources Board (ARB) for effective veldproduct management and monitoring

4.3.5 Strengthen Ministry of Environment, Wildlife and Tourism (MEWT) capacity for effective management of Environmental Impact Assessments (EIAs), including preparation of national EIA guidelines and quality control of EIAs (Ref. 5.4.1- EIA guidelines)

4.3.6 Review and evaluate existing taxonomic and biosystematics capacity and infrastructure and provide adequate funding for strengthening national ability to identify organisms of major groups (plants, mammals, birds, fish, pests)

4.3.7 Compile and publish a national and regional register/directory of bio systematic expertise

4.3.8 Actively encourage training to fill gaps as identified in biodiversity training needs assessment

4.3.9 Raise awareness of environmental and biodiversity economics among government planners

4.3.10 Organise study tours for key planning officers to study new ways of implementing and incorporating environmental planning principles into national, district and town planning procedures and decision-making. South Africa, is at the forefront of implementing innovative methods to encourage mainstreaming of environmental and biodiversity concerns into planning processes and decision-making

Outputs/Products

- NCSA district offices and officers established to improve coordination between the districts and the national level.
- Capacity assessment clarifying infrastructure needs related to biodiversity
- Centres of Excellence (focal point institutions) with responsibility for housing of data, reference collections and expertise for main biodiversity groups
- Capacity of Agricultural Resources Board strengthened
- National Environmental Impact Assessment (EIA) guidelines
- Mechanisms for efficient EIA quality control institutionalised
- National biosystematic (taxonomic) capacity established
- National Environmental Law capacity established
- National and regional directory of biosystematics' expertise
- Improved national human biodiversity capacity
- Raised biodiversity awareness among planners

4.4 National *in situ* and *ex situ* conservation capacity strengthened

Justification

Existing *ex situ* facilities and curation capacity need strengthening to ensure that that the quality of existing collections is maintained, and in order to accommodate future *ex situ* conservation needs. National gene bank, herbaria, museums and other institutions holding national collections need support and fund to ensure long-term curation of existing and future collections.

Actions to achieve targets

4.4.1 Develop comprehensive *ex situ* genetic resources conservation programmes for wild and domesticated animals and plants (Ref 1.2.3 – Collecting programmes)

4.4.2 Strengthen human capacity and infrastructure in existing herbaria, museums, national parks and gene banks

4.4.3 Develop a living collection of medicinal plants at National Botanical Gardens, and duplicate in other botanical gardens as appropriate

Outputs/Products

- *Ex situ* resource conservation programmes
- Improved national capacity and infrastructure for curation and management collections
- Living collection of medicinal plants

4.5 Financial mechanisms and finance in place for biodiversity related activities

Justification

Limited funds and access to funding is probably the biggest limiting factor affecting biodiversity relatec activities. Donor funding for environmental NGOs has been drastically reduced in the last couple of years, and government funding for environmental activities is also limited. Procedures to obtain existing fundinç from donors and government are also lengthy and complicated.

Funding of biodiversity and ecosystem conservation measures should be seen as an investment into the future, as our biological resources are the foundation of many livelihoods. Biodiversity and the environment can also be used to generate funds, i.e. through tourism and recreation activities and through user charges. It is important that there are mechanisms in place to channel these funds back into activities, which support biodiversity, and environmental conservation activities.

Actions to achieve target

4.5.1 Develop funding mechanisms and funding guidelines for biodiversity activities, e.g. reinvest biodiversity charges towards conservation and rehabilitation in line with the proposed Environmental Fund under NDP9 (Ref. 3.1.4 – national audit; 2.3.4 – Seek funding)

4.5.2 Extend legal requirements to include the "polluter pays principle" and extend to reasonable levels of rehabilitation of destroyed habitats, and combine with adequate

enforcement mechanisms.

4.5.3 Through the national accounts, provide sufficient financial means to ensure good curation and maintenance of invaluable national *ex situ* and *in situ* genetic collections (Ref. 3.1.4)

Outputs/products

- Biodiversity charges account for deposit of pollution charges, Environmental Impact Assessment charges for biodiversity conservation and research use.
- Biodiversity fund and guidelines for use
- Legal framework enforcing the polluter pays principle and habitat rehabilitation
- Funding for appropriate curation of national collections

4.6 Economic valuation of ecosystems and cost benefit analysis including environmental costs

Justification

Natural resources are often seen as infinite, and as it is difficult to put a definite economic value on biodiversity and ecological processes the true cost of misuse or depletion is often not considered.

Appropriate economic valuation is needed to measure sound environmental management versus the cost of inaction, restoration or disaster relief and other activities affecting the environment and biodiversity. For the poorest, under-valued market prices can encourage over-harvesting in order to increase volume and thus income, but low market prices can also serve as a disincentive for use of biodiversity. Full insight in the cost and benefits of biodiversity will contribute to greater appreciation for biodiversity.

Actions to achieve targets

4.6.1 Incorporate environmental costs into national accounts and establish specific resource accounts for wildlife, veldproducts, wood and grazing resources (Ref 3.1.4 – National accounts)

4.6.2 Train planners in environmental economics at national and district levels

4.6.3 Value and carry out cost-benefit analysis of the most important natural resources, including the livestock and wildlife sectors, and ecosystems

4.6.4 Develop case study material for Botswana to show how environmental costs can be estimated

4.6.5 Assess the net benefits of biodiversity conservation to give conservation a high priority among policy makers and resource users through linkages with poverty reduction etc.

Outputs/Products

- Resource accounts
- Planners trained in environmental economics
- Calculated value established for selected ecosystems and natural resources
- Case study on estimation of environmental costs
- Estimation of net benefits of conservation

OBJECTIVE 5

COPING WITH ENVIRONMENTAL CHANGE AND THREATS TO BIODIVERSITY

WHY

Prevention is usually a much better and cheaper solution than cure. Addressing threats to biodiversity before they happen will therefore be cost effective in the long-term.

The main threats highlighted during the BSAP Stocktaking phase are addressed under this objective. The BSAP also makes provision for other minor or less known threats and hitherto unknown threats, which require more research to determine their effects on biodiversity levels.

Of all the threats, climatic change poses the greatest challenge as its effects are still not sufficiently known and as it cannot be addressed directly. Rangeland degradation and hydrological change provide more direct and tangible threats to biodiversity, although also affected by climate change to some extent. We have the means and technologies to reduce the effects of these threats, and the main challenge is to find solutions, which are biologically, politically and economically acceptable.

WHAT DOES NDP 9 SAY?

Paragraph 4.40 says that "inefficient natural resources utilisation, threats to biodiversity and wetlands conservation, pollution and waste management and unsustainable use of firewood for energy" will be addressed in conjunction with development opportunities and constraints.

Para 13.80 states that the Exotic Species Policy will endeavour to rationalise the existence of exotic species and institute measures that will minimise their interaction with free ranging indigenous wild populations. It will also provide a framework for regulating future introductions and the management of exotic species

Concerning disaster management, Paragraph 4.52 says that Government has identified the need to integrate disaster management into development planning. A disaster management policy which encompasses the elements of mitigation, preparedness, response and recovery in development has been put in place

WHAT DOES NCS SAY

Threats to components of biodiversity are covered under each main sector.

Of all the issues, degradation of rangeland pastures is recognised to be the hardest to resolve (5.3)

In paragraph 6.2.5 it is stated that beneficial conservation changes expected through the NCS include: the substantial removal of the present principle sources and sites of pollution through a combination of incentives and improved controls.

Strategic targets overview

5.1	Early warning mechanisms and mitigation plans in place to minimise effects of natural disasters on biodiversity.
5.2	Conservation strategies and facilities in place to address identified threats.
5.3	Effects of climate change on vegetation, fauna and livelihoods investigated to allow for appropriate responses
5.4	Reduced levels of habitat destruction and degradation
5.5	Sustainable water use and management with the objective to maintain biodiversity levels
5.6	IAS (including GMOs) management strategies and implementation and enforcement capacity in place
5.7	Water and air pollution levels reduced to reduce biodiversity loss
5.8	Improved understanding of threats to biodiversity

Strategic targets details

5.1 Early warning mechanisms and mitigation plans in place to minimise effects of natural disasters on biodiversity

Justification

Prevention and preparedness is usually much cheaper than restoration and rehabilitation of destroyed habitats and ecosystems. Rare and endangered species can go extinct as a result of severe natural disasters, such as bush fires, drought, flooding and pest outbreaks. It is important to improve our capacity to predict natural disasters from a human point of view, but also to put structures, recovery and mitigation plans and *ex situ* conservation facilities in place which will limit the negative effects on biodiversity. With climate change the fluctuation in rainfall is predicted to increase, resulting in more incidents of droughts and floods.

Actions to achieve target

5.1.1 Develop national environmental indicators and monitoring sites as part of a long-term biodiversity/environmental early warning monitoring programme through a peer reviewed process and implement programme (Ref 1.3 – monitoring and trends)

5.1.2 Based on the above monitoring programme, set up a national biodiversity early warning system with defined mechanisms of response action, which is linked with regional and international early warning programmes (ref. 10.3.3 – regional cooperation).

5.1.3 Establish channels for making early warning results and decision regularly available to the Disaster Management Office and to policy makers, planners and managers of biodiversity and other stakeholders.

5.1.4 Based on the early warning system, design specific mitigation plans and put necessary infrastructure in place to cope with potential natural disasters

5.1.5 Mainstream environmental disaster management into the national development budget (Ref 4.6 – financing mechanisms)

Outputs/Products

Environmental and biodiversity early warning indicators established
Monitoring sites and programmes established
Early warning reports circulated regularly
National biodiversity early warning system in place
Natural disaster mitigation plans established for key disaster areas including climatic disasters, fire, pests and diseases affecting biodiversity.
Environmental disaster management included in national development budget

5.2 Conservation strategies and facilities in place to address identified threats

Justification
Coping with environmental change and threats include putting conservation measures in place, including *ex situ* conservation, and to reduce loss of biodiversity by minimising of potential threats through appropriate actions in response to early warning information.

Habitat reduction and degradation in covered in detail under 5.4.

Actions to achieve goal

5.2.1 Make detailed assessment of current biodiversity threats by district and develop appropriate prevention strategies with identified key actors (District BSAPs – 11.3) and links to the national biodiversity early warning system (ref 5.1.2); Report results in the State of the Environment Report and distribute to all involved sectors

5.2.2 Design recovery and management plans for all RD species and carry out *ex situ* conservation of appropriate species (Ref 2.4.3 – conservation of RD species)

Outputs/Products
- Detailed list of main biodiversity threats by region, and related prevention strategies, specifying responsibilities for implementation
- RD species management and recovery plans
- Selected species conserved *ex situ*

5.3 Effects of climate change on vegetation, animals and livelihoods investigated to allow for appropriate responses

Justification
Climate change will alter the species assemblage and ecosystem structures, e.g. the extent of the mopane belt, which will have socio-economic implications. Even if theses changes are gradual they will have an effect on livelihoods and conservation management activities, and improved understanding of the effects is therefore important.

Actions to achieve targets

5.3.1 Research effects of climate change on biodiversity, focusing on impacts on vulnerable species and areas (Ref. 10.3.3 – regional cooperation)

5.3.2 Integrate drought and other climatic concerns into sectoral planning especially agriculture (Ref 5.1.5 – environmental disasters)

5.3.3 Establish breeding programmes for drought tolerant agro biodiversity varieties and breeds and develop appropriate agricultural methods

Outputs
- Climate trends established
- Species vulnerable to climate change included in Red Data listings
- Plans to counteract the effects of drought and other climatic threats
- Drought tolerant varieties and breeds

5.4 Reduced levels of habitat destruction and degradation

Justification
Habitat destruction erodes ecosystem function and services. Habitat restoration is usually very expensive and the cost is usually absorbed by society rather than by the entity responsible for the damage. Prevention of habitat destruction will therefore be cost effective in the long-term. The true cost of habitat

destruction, including environmental costs, of any development needs to be reflected in any cost/benefit calculations.

Habitat destruction and degradation are caused by direct destruction of habitats through construction, but also through poor land-use management practices.

Actions to achieve targets

5.4.1 Develop national EIA guidelines to cover all sectors and incorporate EIA into the sub district development plans

5.4.2 Develop and set standards for EIAs, including biodiversity and habitat considerations, for all sectors

5.4.3 Enforce EIA and mitigation measures through appropriate penalty scheme for non compliance (4.3.3 – Enforcement capacity, 7.2.2 – EIA follow-up)

5.4.4 Critically examine the effects of the Agricultural Policy, of 1991 especially the accelerated fencing component and the Tribal Grazing Land Policy (TGLP), on biodiversity in the rangelands, and revise if necessary (Ref 4.1.2 – Review of policies)

Outputs/Products

- National EIA guidelines and standards published
- EIA procedures and requirements incorporated into sub district development plans
- Mitigation activities as identified by EIAs enforced
- The effects of fences and grazing and use rights on biodiversity levels established

5.5 Sustainable water use and management with the objective to maintain biodiversity levels

Justification

Hydrological change is a major threat to biodiversity in Botswana. Water is a valuable resource, which must not be over exploited. Appropriate management of water resources, including groundwater includes monitoring of quality and quantity, appropriate planning and management of water supplies, and access rights. At the moment water release calculations, for the major dams, necessary for downstream biodiversity, are not being implemented

Actions to achieve target

5.5.1 Promote wise use of water through: a) awareness campaigns; b) support of Department of Water Affairs' WDM programme; c) improved allocation of water resources; d) up-dated water accounts; e) increase in direct re-use of wastewater

5.5.2 Include environmental impacts of dams into national planning and improve water supply planning to adequately include down stream water issues

5.5.3 Include monitoring of aquatic species, including IAS, in water monitoring programmes (Ref 5.6.2 – Invasive and Alien Species survey)

5.5.4 Implement water release calculations as stated in dam Environmental Impact Assessments

5.5.5 Regularly monitor groundwater levels and characteristics

5.5.6 Enforce EIAs in connection with ground water exploration and borehole schemes

Outputs/Products

- Water awareness information materials
- Up do date water accounts
- Schemes for recycling of wastewater
- Scientific evaluation of the effect of dams
- Monitoring of aquatic species, including IAS in water monitoring programmes
- Controlled dam water releases
- Enforced EIAs

5.6 Effective management of invasive species

Justification

Unintentional introduction of diseases, pests and IAS can be very costly. The extent of IAS in Botswana is not sufficiently known, and Botswana is trailing behind the other countries in the region with regards to inventories and control of IAS, and policies on the use and management of GMOs for example.

Actions to achieve goal

- 5.6.1 Stop government distribution of known IAS through government nurseries
- 5.6.2 Survey levels of Invasive Alien Species (IAS) and indigenous invasive species infestation at ecosystem level and publish updates regularly. (Ref 5.5.3 – Aquatic species and 5.8.3 – Bush encroachment)
- 5.6.3 Establish database on IAS, including indigenous invasive species and desirable alien organisms, and research the effects of introduction
- 5.6.4 Prepare an IAS strategy and policy including classification of IAS and indigenous invasive species and related measures to monitor and control invasive species, with the aim to prevent introduction and spread of IAS, while promoting the use of indigenous species (Ref 6.3)
- 5.6.5 Monitor import, export and movement (translocation) of genetic resources with special emphasis on IAS and indigenous invasive species and disease causing agents, and rare and endangered species and ensure effective enforcement of quarantine and phytosanitary controls
- 5.6.6 Produce IAS Identification guides and relevant information materials for selected target groups, I.e. farmers, tourists etc
- 5.6.7 Put on information campaigns about IAS, especially at borders, airports etc.
- 5.6.8 Train customs and excise staff in basic identification of IAS, the importance of avoiding introduction of IAS, where to get assistance with identification if in doubt and generally about phytosanitary principles (Ref 4.5.2)
- 5.6.9 Amend legislation to tally with IAS and GMO strategy and regional standards assure that the import permit procedures for genetic material include assessment of IAS identification and prohibition (Ref. 4.3 - Legislation)
- 5.6.10 If necessary undertake programmes to control IAS, as per 5.6.4

Outputs/Products

- Publicly available IAS inventory and database
- IAS strategy and classification of IASs
- Records of import and export of genetic resources
- Border controls, quarantine and phytosanitary controls enforced
- IAS identification guides
- IAS Publicity campaign
- Customs staff trained in IAS management
- Legislation to support IAS strategy

5.7 Water and air pollution levels reduced to reduce biodiversity loss

Justification

Pollution can have damaging effects on ecosystem function and services provision, especially wetland ecosystems. Pollution also affects human health. The cost of pollution to society needs to be investigated and considered when setting pollution targets.

Pollution is partly due to un-educated behaviour and partly to short-term economics. A mix of economic incentives to reduce levels of pollution, standards and measures for legal enforcement and education is therefore needed to reduce pollution levels.

Actions to achieve targets

5.7.1 Study the effects and costs of pollution of biodiversity and value the biodiversity losses and include in cost analysis Ref 3.1.4 – (Environmental audit)

5.7.2 Develop, and/or refine, implement and enforce pollution standards, to include pollution of air, water and land.

5.7.3 Identify sources and root causes of pollution and implement mitigation measures to reduce pollution at source and establish pollution covenants between government and the private sector and enforce the polluter pays principle.

5.7.4 Monitor hydrological change and water quality, especially around urban centres and around industries

5.7.5 Investigate and implement wider use of integrated pest management to reduce pesticide use (Ref 3.8.6 – Awareness of farmers)

Outputs/Products

- Government briefing note on biodiversity and pollution to guide national planning
- Revised national pollution standards
- Government incentives to reduce pollution levels
- Water quality records and trends
- Reduced levels of pesticide use

5.8 Improved understanding of threats to biodiversity

Justification

The BSAP stocktaking process brought up a list of threats to biodiversity in Botswana, including fire and elephant damage. There is currently debate on the level of threat posed by the latter two and further research is needed to improve our understanding of their effects on biodiversity. The impact of HIV/AIDS on long-term biodiversity conservation also needs further investigation.

The list of threats to biodiversity is not exhaustive and new threats may emerge, while the severity of some of today's low-level threats may increase. It is therefore important to continue the monitoring of threats and their effects on biodiversity and adapt mitigation activities accordingly.

Actions to achieve targets

5.8.1 Research the effects of bushfires on different components of biodiversity and identify and implement strategies and training to minimise the negative effects of bushfires and include in fire and land management plans

5.8.2 Research the effects of large elephant populations on biodiversity and long-term elephant population trends in Botswana

5.8.3 Review existing information, and if necessary continue research into the effects and management of bush encroachment, over-grazing and over stocking on rangelands

5.8.4 Review existing information and continue investigation and research into potential and new threats to biodiversity in Botswana

Outputs/Products

- Scientific report on the relationship between bushfires and biodiversity to guide planning and resource allocation and if relevant, strategy on bushfire control
- Fire management plans
- Scientific report on the effect of elephants on biodiversity in Botswana, and if relevant strategy to minimise effects of the elephant population on biodiversity.

OBJECTIVE 6

RAISED PUBLIC AWARENESS AND APPRECIATION OF BIODIVERSITY TOGETHER WITH ACTIVE PUBLIC PARTICIPATION IN BIODIVERSITY RELATED ACTIVITIES AND DECISION-MAKING PROCESSES

WHY

This is an extremely important objective as the way we think of and value biodiversity form the foundation on which to build sustainable use and management of this natural resource. There is still a need to raise general awareness levels of the value of Botswana's biodiversity capital to society and the ecological services it provides.

Public participation in decision-making involving the use of biodiversity will encourage public support and participation and is vital to achieve sustainable solutions, be it for land use, or use of components of biodiversity.

WHAT DOES NDP 9 SAY?

"Public participation in policy formulation, implementation and decision-making is critical to sustained environmental management. Government will share and provide access to information such that every member of society may actively participate in the execution of national environmental responsibilities "(Paragraph 14.38)

Environmental economic concepts and methods will greatly assist environmental mainstreaming but at present the potential is minimally used. The intrinsic and total economic value of most natural resources is not known, and neither is the cost of environmental damage.

WHAT DOES NCS SAY

According to paragraph 3.7.6, the need for public awareness applies both to all of the issues (addressed by the NCS) and to the NCS in general.

"Public awareness about environmental issues needs to be raised significantly, so that conservation is achieved for the benefit of future as well as present generations."

Paragraph 6.4.2 further states that "through the NCS, public awareness about the importance and value of both sustainable development and conservation will be widened as will as intensified."

With regards to quality of life and access to green spaces the NCS states that "it is the intention of Government to enhance the landscapes of all main settlements through the provision of well planned, designed and managed areas of open space for public recreational use and the establishment of significantly increased numbers of well grown trees.

Strategic targets overview

6.1	Raised public awareness about the value and need to conserve Botswana's biodiversity, related indigenous knowledge and traditional
6.2	Promotion and priority given to use of indigenous species in public places and in habitat restoration programmes
6.3	Quality of life and appreciation of biodiversity improved
6.4	Enhanced participation by community, civil society, including youth in biodiversity related activities
6.5	Gender issues mainstreamed into the biodiversity planning framework to enhance participation

Strategic targets details

6.1 Raised public awareness about the value of and need to conserve Botswana's biodiversity, related indigenous knowledge and traditional practices, and relevant government policies

Justification

Ignorance on the role of biodiversity in development can lead to unsustainable and destructive use for short-term gains which might prove expensive for society in the long-term. The best way of ensuring conservation and wise use of biodiversity is therefore to make people aware of its value, and thus empower them to make informed choices relating to use.

Indigenous knowledge and traditional practices are part of the nation's cultural heritage. The transfer of indigenous knowledge and traditional methods is slowly being eroded because of demographic change and changes in attitudes. Traditional learning and knowledge, and appreciation of cultural taboos and spiritual values are not only part of the cultural heritage but may contribute to the conservation and sustainable use of the country's biological resources.

The BSAP stock take consultation highlighted that dissemination of government biodiversity related policies and strategi is not always efficient and this has the effect that some policies are not always clearly understood and appreciated at community level. Biodiversity awareness campaigns should therefore include information on relevant policies and strategies in an easy to understand way.

Actions to achieve targets

6.1.1 Develop and implement a national biodiversity awareness and advocacy strategy aimed at all levels of society (Ref. 11.1.3 – Specific high level BSAP awareness)

6.1.2 Continue dissemination of existing biodiversity and CBD information material and, if necessary, develop new training and information materials in appropriate languages, using a variety of media

6.1.3 Incorporate biodiversity awareness (the importance of maintaining biodiversity and related indigenous knowledge such as traditional and cultural practices, such as taboos, totems in the national curriculum at all education levels and develop appropriate teaching aids

6.1.4 Establish biodiversity/environmental information centres in each district, linking with museums and NGOs as appropriate

6.1.5 Encourage community skill transfer workshops on indigenous knowledge and traditional practices

6.1.6 Within the botanical gardens establish medicinal plant gardens to encourage further development of knowledge and skills associated with the local use of medicinal plants

Outputs/Products

Biodiversity awareness strategy
Training and information materials
Revised school curricula for all levels of education to include relevant biodiversity issues
Media broadcasts and information campaigns
Revised curricula for all levels of education

- Community skills transfer workshops
- Medicinal plant gardens
- Improved public knowledge levels of medicinal plants and in the extension, improved family health
- Improved public understanding of government biodiversity related policies and strategies

6.2 Promotion and priority given to use of indigenous species in public places and in habitat restoration programmes

Justification

The appreciation of indigenous plant species for landscaping purposes is currently limited, even though these species are often much better suited to the climate, requiring less water. Government should set an example and use and promote indigenous and drought resistant plant species in public places.

Actions to achieve targets

6.2.1 Government nurseries to focus on propagation and distribution of indigenous species wherever possible

6.2.2 Active promotion of the use of indigenous flora in habitat restoration programmes, around public buildings and Council managed areas (Ref. 2.7 - Restoration).

6.2.3 Encourage domestication, breeding and propagation of indigenous species with horticultural potential

Outputs/Products

- Increased availability of indigenous horticultural plants
- Indigenous plants cultivated in public places
- Increased number of domesticated indigenous species

6.3 Quality of life and appreciation of biodiversity enhanced through increased access green recreational areas

Justification

Quality of life is not only related to income and poverty levels, but is also affected by the environment in which we live. Provision of green areas within and around cities and settlements will in the long-term add to the quality of life of the urban and village populations and add to the appreciation of biodiversity.

Actions to achieve targets

6.3.1 Strengthen the link between biodiversity conservation and poverty alleviation schemes (Ref 3.3.3 – Poverty alleviation)

6.3.2 Encourage development and maintenance of parks and green areas in and around urban centres and other settlements

6.3.3 Establish smaller botanical gardens in urban areas other than Gaborone, for recreation and education and link with school market gardens and urban and village vegetable plots

Outputs/Products

- Increased number of parks and recreational areas
- Local botanical gardens
- Biodiversity enhancing poverty alleviation projects

6.4 Enhance participation by civil society, including youth in biodiversity related activities

Justification

Consultative, participatory and decentralized approaches to biodiversity conservation will have the greatest impact on long-term biodiversity conservation and more clearly represent societal choice.

The BSAP stock take brought up many concerns relating to the lack of interest in learning about indigenous knowledge and traditional methods by the younger generations. The youth are the key to the future

and it is important to involve them in biodiversity related issues if we want traditional practices and indigenous knowledge to be passed on to future generations. For the cultural heritage to survive it is therefore crucial to find means and ways of encouraging youth to participate in biodiversity related activities. There is considerable experience of biodiversity related youth projects in other parts of Africa, and Botswana with its relative prosperity and low population density is in a good position to learn from these and successfully implement similar activities in Botswana.

Actions to achieve targets

6.4.1 Review existing biodiversity programme and identify current and potential role of communities and NGOs in biodiversity conservation (Ref 3.3.1 – Diversification of CBNRM)
6.4.2 Amend and approve CBNRM policy and initiate implementation
6.4.3 Prepare and publish CBNRM manual
6.4.4 Review African experiences on programmes to encourage active youth participation in biodiversity related activities and transfer of traditional knowledge.
6.4.5 Initiate a national programme to encourage youth participation in biodiversity, including agro biodiversity, conservation activities

Outputs/Products

7 Roles of communities and NGOs in biodiversity conservation established
8 CBNRM review report
9 CBNRM policy
10 CBNRM manual
11 National Youth/biodiversity activity scheme

6.5 Gender issues mainstreamed into the biodiversity planning framework to enhance participation

Justification

The future of biodiversity conservation depends on the active involvement of all groups of society, including women and youth. There is an increase in the number of female-headed household for whom biological resources provide livelihoods opportunities.

Actions to achieve target

6.5.1 Evaluate gender access and ownership of natural resources with regards to the current institutional and policy environment, with the aim of addressing gaps or inequalities in national policy
6.5.2 Improve women's access to credit facilities in order to utilize natural resources such as veld products and medicinal plants

Outputs/products

- Gender related statistics on resource utilisation
- Gender sensitive credit schemes

OBJECTIVE 7

FAIR ACCESS TO BIOLOGICAL RESOURCES AND EQUITABLE SHARING OF BENEFITS ARISING FROM THE USE OF BIOLOGICAL RESOURCES

WHY

Fair access to biological resources and equitable sharing of benefits deriving there from is one of the three key components of the CBD. The BSAP stock take has highlighted the gaps in existing legislation with regards to the right of access to biodiversity resources, and the need to strengthen import and export regulations and enforcement in order to encourage use of biodiversity components and to discourage bio-piracy and un-equitable sharing of benefits.

There is an urgent need for a specific Access and Benefit Sharing (ABS) strategy, which will address actual access to resources as well as to related indigenous knowledge and property rights. The strategy should also identify means of encouraging fair benefit distribution. The ABS strategy would subsequently need to be supported by appropriate legislation.

One important concept to consider is to link the right to access to resources with the responsibility of sustainably using and monitoring of the same resource.

WHAT DOES NDP 9 SAY?

NDP 9 does not specifically address access to genetic resources and means of benefit sharing, but in Paragraph 14.57 it mentions the need to "consolidate CBNRM during NDP9 which would require accelerated implementation of the CBNRM Policy and legislation."

NDP 9 also addresses the need for an overarching Environmental Management Act (Paragraph 14.48). This Act should include specific legislation to guide access to genetic resources and it also needs to address benefit-sharing issues.

Paragraph 14.42 recognises that "Comparative advantages related to the environment are associated with the abundance of solar power, some veld products, wildlife, water conservation, livestock and minerals."

WHAT DOES NCS SAY

One of the expected benefits of the NCS is greater social and community benefits (Paragraph 6.4.1). although access and benefit sharing are not addressed *per se*.

An important part of the NCSs however is to encourage economic diversification and the strategy draws attention to the many diversification opportunities involving biodiversity resources. To take advantage of these opportunities a system to regulate access and benefit sharing is essential.

Strategic targets overview

7.1	Fair access to biological resources and benefit sharing
7.2	Access to biodiversity linked to responsibility for sustainable management
7.3	Legal protection of innovations associated with genetic resources, local knowledge and skills improved

Strategic targets details

7.1 Fair access to biological resources and benefit sharing

Justification

Societal support of biodiversity conservation is based on equitable access and appropriate benefit streams. Access and benefit sharing strategies and subsequent implementation should serve to ensure that benefits from use of biodiversity are shared equitably.

Actions to achieve targets

7.1.1 Develop Access and Benefit Sharing (ABS) strategy, policy and mechanisms for distribution of benefits and include international transfer of genetic resources and related knowledge. While waiting for the ABS strategy ensure that all genetic materials sent out of the country are accompanied by relevant Memoranda of Understanding (MOUs) and Material Transfer Agreements (MTA)

7.1.2 Establish guidelines for access to biodiversity, benefit sharing and prospecting

7.1.3 Provide legislative and regulatory framework on access to biodiversity, taking regional experiences into consideration

7.1.4 Ensure that all transfers of genetic resources are in line with the Convention on Biological Diversity, the International Treaty on Plant Genetic Resources for Food and Agriculture and other applicable international and regional agreements and standards

Outputs/Products

12 ABS strategy and policy
13 ABS implementing guidelines
14 Legislation addressing ABS
15 Controlled transfer of genetic resources

7.2 Access to biodiversity linked to responsibility for sustainable management

Justification

Rehabilitation and restoration of ecosystems and biodiversity is expensive. Whereas the profits of developments and industry normally benefit individuals or companies, the environmental cost are often borne by society. Users of biodiversity should therefore be made to take appropriate responsibility fo its sustainable use and for monitoring of the resource.

Actions to achieve targets

7.2.1 Ensure access to resources and responsibility for sustainable development is covered in Veldproduct Policy (to be developed - Ref. 3.9.1)

7.2.2 Active follow-up on EIAs to ensure that mitigation activities are carried out satisfactorily (Ref 5.4.3 enforcement)

7.2.3 Introduce resource access with responsibility for monitoring of resources (Ref. 1.3.7 – User based monitoring)

Outputs/products

Access issues addressed in Veldproduct policy
Mechanisms for enforcing implementation of EIA mitigation activities
Monitoring responsibilities included in conditions for resource permits and quota allocations