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GENERAL NOTICE

NOTICE 1095 OF 1997

WHITE PAPER ON THE CONSERVATION AND SUSTAINABLE USE OF SOUTH AFRICA'S BIOLOGICAL DIVERSITY

***Please note that comments on this document should be made in writing by or before
29 AUGUST 1997 to the following address:***

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0001

**White Paper
on the Conservation and
Sustainable Use of South Africa's
Biological Diversity**

May 1997

Draft for Discussion

Department of Environmental Affairs and Tourism

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STEPS IN THE POLICY FORMULATION PROCESS

- ❑ In April 1995 a meeting was called by Senator Stéfanus Grové, who chairs the Senate Portfolio Committee for Environment, and the Department of Environmental Affairs and Tourism, to discuss civil society involvement in the development of a biodiversity policy. This was largely in response to South Africa's signing and imminent ratification of the United Nations Convention on Biological Diversity. Up until this point, issues pertaining to the Convention had been considered by a sub-committee of the Committee for Environmental Coordination, constituted under the Environment Conservation Act 73 of 1989, but there was concern that this structure did not provide for non-governmental representation.
- ❑ Shortly after this meeting, a separate steering committee was constituted, to reflect the current constitutional ethos, and to manage the policy process. The steering committee comprises the chairman of the Senate Portfolio Committee for Environment, as well as representatives of the Department of Environmental Affairs and Tourism (DEAT), the Land and Agriculture Policy Centre (LAPC) and the Danish Cooperation for Environment and Development (DANCED). One of the tasks of the Steering Committee is to ensure the preparation of necessary policy documents and to enable this, an editorial committee was established and an editorial consultant contracted to draft such documents. A Secretariat was also established to facilitate communication between different roleplayers.
- ❑ A reference group was also constituted, comprising representatives of a range of central and provincial government departments, statutory boards, and non-governmental organisations. The tasks of the reference group were to guide the Steering Committee in the management and implementation of the policy process; to accept responsibility for the consultation process; and to ensure that the content of the policy adequately reflects the various concerns and interests of different constituencies.
- ❑ In March 1996 a discussion document was released for public comment, as the start of a process to solicit the views of all organisations or individuals interested in, or affected by, issues concerning the conservation and sustainable use of biodiversity in South Africa. Seven hundred copies of the document were distributed to a wide range of groupings. In addition, an educational leaflet was prepared about the document, to assist those unfamiliar with the concepts of biodiversity. This was translated into English, Afrikaans, Xhosa, Zulu and Pedi. Two thousand three hundred copies of the educational leaflet were distributed throughout the country. A summary of the discussion document was also compiled, of which 600 copies were made available.
- ❑ To encourage broad participation in the process, stakeholder briefings were held throughout the country, at which people were informed of the process, and key issues were raised. In total, ten such briefings were held in seven provinces. In addition, an invitation to participate in the process was widely distributed to some 3 000 organisations.
- ❑ A national consultative conference was held in Pretoria in May 1996, to discuss the issues raised in the discussion document, and to explore the range of policy options available to achieve certain goals. One hundred and sixty representatives attended the conference and their input at the conference, together with 46 sets of comments from a variety of

individuals, organisations and organised groupings, comprised the basis from which a Green Paper was drafted. The Green Paper was released for public comment by the Minister of Environmental Affairs and Tourism on the 28 October 1996. The closing date for comments was 13 December 1996. Comments received up until 13 January 1997 were, however, incorporated.

- ❑ As of 13 January 1997, written comments on the Green Paper had been received from 57 groupings, organisations and individuals, totalling more than 180 pages of text. Each submission was considered by the Editorial Committee, who then made recommendations concerning language changes and the inclusion or exclusion of text.
- ❑ A draft White Paper was submitted to the Reference Group in February 1997, who recommended that the policy document, with minor modifications, be submitted to the Minister of Environmental Affairs and Tourism, and to MinMEC, as a matter of urgency. The Reference Group concluded at this meeting that its work was complete, and expressed general satisfaction with the outcome of the policy process. The Steering Committee and Editorial Committee were mandated to see the policy process through to the adoption of the White Paper by Parliament as formal policy.
- ❑ An immediate step that will follow this policy will be the development of a detailed implementation strategy and action plan, including a full costing for implementation. This will be undertaken through the establishment of working groups, and will also form part of the National Environmental Strategic Action Plan (NESAP) that will follow the establishment of general national environmental policy.

WHAT IS BIODIVERSITY?

Biological diversity - or "biodiversity" - is the number and variety of living organisms on earth, the millions of plants, animals, and microorganisms, the genes they contain, the evolutionary history and potential they encompass, and the ecosystems, ecological processes, and landscapes of which they are integral parts. Biodiversity thus refers to the life-support systems and natural resources upon which we depend.

There are three main components of biodiversity:

① GENETIC DIVERSITY

Genes are the biochemical packages that are passed on by parents to their offspring, and which determine the physical and biochemical characteristics of offspring. Genetic diversity refers to the variation of genes within species, making it possible to develop new breeds of crop plants and domestic animals, and allowing species in the wild to adapt to changing conditions.

② SPECIES DIVERSITY

A species is a group of plants, animals, microorganisms, or other living organisms that are morphologically similar; that share inheritance from common ancestry; or whose genes are so similar that they can breed together and produce fertile offspring. Usually different species look different. Species diversity refers to the variety and abundance of species within a geographic area. Often the term "species richness" is used as a measure of species diversity, but this refers only to the number of species within a region, and thus technically only one component of diversity.

③ ECOSYSTEM DIVERSITY

An ecosystem consists of communities of plants, animals and microorganisms, and the soil, water, and air on which they depend. These all interact in a complex way, contributing to processes on which all life depends such as the water cycle, energy flow, the provision of oxygen, soil formation and nutrient cycling. Ecosystem diversity can refer to the variety of ecosystems found within a certain political or geographical boundary, or to the variety of species within different ecosystems.

Another level of diversity which is sometimes included in the definition of biodiversity is **LANDSCAPE DIVERSITY**. A landscape is a collection of elements which consists of defined assemblages of plants, animals, abiotic substrata such as rocks, land-use patterns, as well as cultural or scenic features and socio-economic and political dynamics. For example, wetlands, fragments of forest, mountains, or rocky shores may comprise landscapes, as may the presence of croplands or religious structures. The boundary of a landscape will vary according to the scale being used and the purpose of the investigation. Landscape diversity refers to the number of landscapes in the geographical area being studied.

CHAPTER 1.

INTRODUCTION

1.1. *International Policy Context*

1.1.1. **Background**

There is worldwide concern that human activities such as pollution, habitat destruction, over-exploitation and foreign plant and animal invasions are resulting in the ever-increasing loss of the earth's biological wealth. The implications of this are considerable. If continued unabated, we stand to lose crucial life-support systems through the loss of important habitats; to undermine rural livelihoods, with the degradation of the natural resource base on which people depend; and to diminish economic opportunities, as options for developing medicines and foods are reduced and the natural resource base for tourism is damaged.

Clearly, action is needed. However, if there is to be global cooperation to conserve biodiversity, recognition needs to be given to its uneven distribution around the world. Two-thirds of the world's biodiversity is located in developing countries, collectively termed 'The South', and provides an important resource for the economic development of such countries. Biodiversity conservation thus carries a heavier burden for developing countries than for the biologically poorer 'North', comprising the industrialised countries. Furthermore, it has largely been private companies in industrialised countries which have benefited from the South's biological riches. Thus, it is argued by developing countries that issues such as access to genetic resources and technology, and the equitable sharing of benefits from the conservation and use of biodiversity, must be included in any global agreements concerning biodiversity.

1.1.2. **The Convention on Biological Diversity**

It was in this context that the negotiations leading to the United Nations Convention on Biological Diversity were framed. Opened for signature in June 1992 at the United Nations Conference on Environment and Development (UNCED), the Convention entered into force in December 1993. The treaty is a landmark in terms of reconciling environment and development as it couples environmental objectives to the need for development in developing countries. While recognising that the conservation of biodiversity is a "common concern" of humankind, it emphasises the fact that natural resources are the property of individual countries. It ties this right to a national responsibility for environmental conservation, placing most decision-making at the national level.

The three objectives of the Convention are:

- *the conservation of biodiversity;*
- *the sustainable use of biological resources; and*
- *the fair and equitable sharing of benefits arising from the use of genetic resources.*

South Africa did not actively participate in the Convention negotiations and has largely been isolated from discussions around its issues. This has resulted in a general lack of awareness and understanding of the complex of issues that it raises. Many of these issues are, however, of

importance for the country's economic development, and have considerable implications for the future use and conservation of our natural resources.

As a Party to the treaty, South Africa is obliged to ensure that the agreement is implemented in accordance with its objectives. The state is also required to:

develop national strategies, plans or programmes, or adapt existing ones, to address the provisions of the Convention, and to integrate the conservation and sustainable use of biodiversity into sectoral and cross-sectoral plans, programmes and policies.

South Africa's response to this requirement is contained within this document, which articulates the country's policy and strategy towards achieving the objectives of the Convention.

1.2. South Africa's Biodiversity: A Living Heritage

1.2.1. A country of remarkable diversity

South Africa's unique biological diversity - the variety of genes, species, ecosystems and ecological processes occurring in the country - is an asset of international, national and local value and significance. Her rivers and wetlands, mountains and plains, estuaries and oceans, and magnificent coastline and landscapes contain an exceptionally rich and varied array of life forms which are integral to the existence of all South Africans, and upon which the national economy is fundamentally dependent.

The remarkable richness of South Africa's biodiversity is largely as a result of the mix of tropical and temperate climates and habitats occurring in the country. Indeed, South Africa ranks as the third most biologically diverse country in the world¹, and as such is of major global importance for biodiversity conservation (see Figure 1, page 3). This fact is mostly attributable to the extraordinary plant richness contained within the country: some 18 000 vascular plant species occur within our boundaries², of which 80% occur nowhere else. Furthermore, South Africa is the only country on Earth to have within its national confines an entire plant kingdom - one of just six in the world. Known as the Cape Floral Kingdom, this area has the highest recorded species diversity for any similar sized temperate or tropical region in the world. The Cape Floral Kingdom is the world's 'hottest hotspot' of global conservation concern, the term 'hotspot' referring to areas where high levels of species richness, endemism as well as threat coincide. Other biomes (or ecological units) in the country are also of global conservation significance, for example one third of the world's succulent plant species are found in South Africa.

In addition to this extraordinarily varied plant life, a wealth of animal life exists in the region, both in numbers and variety. South Africa hosts an estimated 5.8% of the world's total of mammal species; 8% of bird species; 4.6% of the global diversity of reptile species; 16% of the total number of marine fish species in the world; and 5.5% of the world's described insect species. In terms of the number of mammal, bird, reptile and amphibian species which occur

¹ This is based upon an index derived by the World Conservation Monitoring Centre, which has calculated an overall diversity index based on species richness for vertebrates and higher plants and richness in endemics. Source: World Conservation Monitoring Centre. 1992. Development of a National Biodiversity Index. A discussion paper.

² Within the southern African region, 23 404 taxa have been recorded.

only in this country ('endemics'), South Africa is the 24th richest country in the world, and the 5th richest in Africa.

South Africa's marine life is similarly diverse, partly as a result of the extreme contrast between the water masses on the East and West Coast. Three water masses - the cold Benguela current, the warm Agulhas current, and oceanic water - make the region one of the most oceanographically heterogeneous in the world. Over 10 000 plant and animal species - almost 15% of the coastal species known worldwide - are found in South African waters, with about 12% of these occurring nowhere else.

Figure 1. Species Richness of South African Taxa³

TAXA	NUMBER OF DESCRIBED SPECIES IN SOUTH AFRICA	PERCENTAGE OF THE EARTH'S TOTAL
Mammals	227	5.8%
Birds	718	8%
Amphibians	84	2.1%
Reptiles	286	4.6%
Freshwater fish	112	1.3%
Marine fish	2 150	16%
Invertebrates	77 500	5.5%
Vascular Plants	18 625	7.5%

The statistics in Figure 1 exclude many groups such as fungi and different types of microorganisms, and only reflect the numbers of some described species. Obtaining a more precise estimate is difficult, as no-one really knows the exact number of species that exist in South Africa. Nonetheless, we do know that species richness is extremely high. Estimates of total species numbers in the country vary from 250 000 to 1 000 000, a richness which is reflected in the vast array of ways in which our biological resources are used by rural and urban people, as well as by industrial concerns.

1.2.2. Biodiversity under threat

Human activity has been changing South African ecosystems for thousands of years, but the pace and extent of change increased rapidly with agricultural and industrial development. Present estimates suggest that a substantial proportion of natural habitat has been transformed - largely by agriculture, urban developments, afforestation, mining, and dams. In addition to habitat loss and degradation, the overexploitation of certain species, the introduction of exotic

³ Figures adapted from Siegfried, W.R. 1989. Preservation of species in southern African nature reserves. In: *Biotic Diversity in Southern Africa*. Edited by B.J. Huntley. Oxford University Press, Cape Town; and World Conservation Monitoring Centre. 1992. *Global Biodiversity: Status of the Earth's Living Resources*. Chapman & Hall, London. Invertebrate figures obtained from Dr H. Robertson at the South African Museum.

species, and the pollution or toxification of the soil, water and atmosphere have had major effects on South Africa's terrestrial, freshwater and marine biodiversity. Already 3 435 (15%) of South Africa's plant species, 102 (14%) of bird, 72 (24%) of reptile, 17 (18%) of amphibian, 90 (37%) of mammal, and 142 (22%) of butterfly species are listed as threatened in the South African Red Data Books, which indicate the conservation status of threatened species and ecosystems. In addition, many important ecosystems have been degraded, and ecological processes impaired. Trends indicate that this situation is not improving, and that growing human populations and unsustainable rates of resource consumption will result in increasing negative impacts on biodiversity. Unless we act fast and effectively, much biodiversity, including the life-support systems upon which we rely, will soon be lost.

1.2.3. The benefits of conserving biodiversity

What will happen if we do not take immediate action? We will undermine the natural resource base upon which people depend; we will foreclose existing and future economic opportunities of using biodiversity; and we will jeopardise ecological processes which are necessary to keep our country fit for life.

Benefits derived from species harvested in the wild. The benefits of conserving biodiversity are numerous. A large proportion of South Africa's population are directly dependent upon biological resources for subsistence purposes, including the gathering, harvesting or hunting of animals and plants for food, medicine, shelter, fuel, building materials, and trade. The use of biological resources thus provides an important buffer against poverty, as well as opportunities for self-employment in the informal sector. Several industries are also directly dependent upon the use of local species for economic gain. For example, the South African fishing, hunting, wildflower, horticulture, natural product and wood-harvesting industries are all, to varying extents, reliant upon species harvested from the wild.

Benefits derived from the direct use of ecosystems. But benefits arising from the conservation of South Africa's biodiversity are not only restricted to the direct use of species. South African ecosystems are directly used for grazing, croplands, mining, recreation and tourism. If such resources are not adequately conserved, we run the risk of losing the economic benefits gleaned from their use, and of foreclosing options for their use by future generations.

Benefits derived from ecological services. One of most fundamental benefits of conserving biodiversity lies in the ecological services which it provides. These are essential to fulfilling human needs as well as those of all life on Earth. Amongst a vast range of benefits, some services include:

- maintenance of the hydrological cycle, and thus the provision of clean water;
- maintenance of atmospheric quality, which in turn provides pure air to breathe and helps to control the climate;
- the generation and conservation of soils, which are essential to agriculture and forestry;
- protection from erosion;
- nutrient cycling;
- pollutant breakdown and absorption;
- control of many potential crop pests and vectors of disease;
- the pollination of many crops;
- maintenance of a vast resource of genetic materials from which South Africa and other countries have developed crops, domestic animals, medicines and industrial products; and

- perhaps most importantly, the insurance and basis for adaptation which biodiversity provides against large changes in climate and ecosystem processes - a factor of particular concern to South Africa, whose climate is expected to become increasingly drier as global climate changes.

Enriching our cultural diversity. Benefits from conserving biodiversity go beyond material rewards. Through the use and appreciation of South Africa's biological diversity, a rich cultural and traditional knowledge and deep attachment to the country's natural heritage and beauty have developed amongst South Africa's people.

In the words of President Nelson Mandela,

"Each one of us is intimately attached to the soil of this beautiful country. Each time one of us touches the soil of this land, we feel a sense of personal renewal".

Inauguration Speech, 12 May 1994

1.3. The History of Biodiversity Conservation in South Africa

1.3.1. Terrestrial conservation

For many centuries, conservation has been practised by the peoples of South Africa, evidence suggesting the application of elaborate natural resource management systems by indigenous African people such as the San, Khoi and Nguni prior to the country's colonisation. Because most traditional African societies were for the most part dependent upon natural resources, including the wildlife that surrounded them, political systems generally included a set of rules and procedures designed to regulate the use of natural resources. Examples include the setting aside of hunting preserves for Zulu royalty, soil conservation methods of the BaTswana people, and totemic protection among people such as the BaSotho. A rich folklore reflected the close relationship between traditional societies and nature, and linked people to the environment through an ethic which was strongly spiritual and cultural.

These systems changed substantially with the colonisation of South Africa, and in particular with the intensification of hunting activities by European settlers, the acquisition of guns by local people, and the ranching of cattle, sheep and goats. In a response to diminishing resources, a number of *placaaten* were promulgated by Jan van Riebeeck shortly after colonisation to protect gardens, lands, and trees from destruction, and the natural resources upon which the Dutch East India Company depended.

The first official protected areas in South Africa were the forest reserves of Knysna and Tsitsikamma, proclaimed in terms of the Cape Forest Act of 1888. This was followed by the establishment of forest services in Natal in 1891, and in the Orange Free State and Transvaal by 1903. Also established during this period, as a response to declining wildlife numbers and uncontrolled hunting, were a number of statutory game reserves, specifically the Pongola and Sabie Game Reserves in the Transvaal in 1894 and 1898 respectively, the Hluhluwe, Umfolozi and St Lucia Game Reserves in Zululand in 1895, and Giant's Castle in the Drakensberg in 1903. The location of such reserves was in many instances pre-determined by the presence of tsetse fly and malaria, or by the fact that their agricultural potential was poor.

After Union in 1910 the central government assumed conservation responsibility for forestry, inland waters, islands and the sea-shore, and in 1926 the first National Parks Act was promulgated. Fish and game preservation was, however, a function allocated to the provinces, who continued to expand their activities and establish nature conservation agencies to deal with the control and administration of biological resources. Noteworthy is the fact that from the 1860s onwards, many private landowners saw the need to protect game from hunting, and established preserves on their farms⁴.

After Union, and indeed up until recent times, influential lobbies continued to secure additional areas and stronger legislation for protected areas. However, despite the fact that nature conservation legislation continued to grow, this was neither part of a holistic land-use policy, nor matched by achieving the satisfactory conservation of biodiversity outside of protected areas. Moreover, the establishment of protected areas was often accompanied by forced removals and resource dispossession among black people. The dominant approach prevailing during this period was that protected areas ought to be "pristine", fenced-off areas. Such approaches have resulted in the widely held perception that protected areas are playgrounds for a privileged elite, and that biodiversity conservation is exclusive and irrelevant to the majority of South Africa's people.

Despite this history, there is little doubt that South Africa, and those charged with managing biodiversity, have made remarkable achievements towards achieving the conservation of our natural heritage. Indeed, South Africa is globally renowned for its nature conservation practices, a reputation it has gained primarily through the well developed system of protected areas in the country, and its efforts towards conserving threatened species. In this regard, past government policies have been extremely supportive of biodiversity conservation and developing the scientific capacity to manage biological resources. Of particular importance have been the extensive efforts over the past thirty years to expand nature conservation functions to private and communal lands, through conservancies, natural heritage sites, community conservation areas, and cooperative conservation models such as biosphere reserves.

1.3.2. Marine conservation

South Africa has a long history of using marine resources, dating back to prehistoric times. Even a thousand years ago, evidence from coastal middens suggests that at a local level resources were being over-exploited. The first documented fishery regulations were passed by Van Riebeeck in the 17th century, although substantial attempts at management began only with the development of the major fisheries in the early twentieth century. As is the pattern throughout the world, initial resource discovery was followed by exploitation, with depletion occurring in many cases, following a typical "boom and bust" cycle. Whales, seals and penguins were among the first to decline to critical levels, but historically virtually every one of South Africa's marine resources, including rock lobster, pilchard, hake, kingklip, and most linefish, has been overexploited at some time. Many remain over-exploited, although when compared to other countries South Africa has a relatively well-managed fishery. Responsibility for the management of marine resources is vested in central government, which over the years has introduced a variety of measures to control exploitation. Poor enforcement of recreational and linefish regulations has, however, resulted in a large amount of poaching, which has been cited as one of the major causes of stock declines for endemic linefish and shellfish.

⁴ See, for example, Stevenson-Hamilton, J.C. 1993. *South African Eden. The Kruger National Park. 1902-1946*. Struik, Cape Town.

Several marine protected areas exist along the coastline, including two of the largest "no take" reserves in the world. However, their establishment has largely been *ad hoc* and few have management plans, staff or effective enforcement. Similarly, a lack of attention has been paid to coastal zone management, with estuaries in particular being the most threatened of South Africa's marine habitats.

As is the case for terrestrial areas, South Africa has a well developed marine science research capacity, her scientists standing at the forefront of many international endeavours. Public education and awareness programmes, however, have been slow to develop by comparison. On the whole, a poor environmental ethic exists amongst those using marine resources.

1.4. The Scope of Biodiversity Policy in South Africa

The formulation of a coherent biodiversity policy and strategy for South Africa is long overdue, and takes place at a time in South Africa's history when many other policies of relevance to biodiversity are being developed. In particular, this policy comprises part of the broader context wherein national environmental policy is presently being formulated (the Consultative National Environmental Policy Process or CONNEPP). Other relevant policies that have recently been developed or are in the process of being developed include those on land, energy, trade and industry, tourism, science and technology, population, forestry, water and sanitation, minerals and mining, fisheries, integrated pollution control, coastal zone management, endangered species, and wetlands conservation. Also of relevance are the various policy initiatives taking place in response to international treaties, such as those on Climate Change and Desertification. At the international level, Agenda 21 - the global plan of action for sustainable development - provides an important framework within which all of such policies need to be considered.

Underpinning all of these initiatives is South Africa's new Constitution which provides within its Bill of Rights that everyone has the right

- (a) to an environment that is not harmful to their health or well-being; and*
- (b) to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that:
 - i) prevent pollution and ecological degradation;*
 - ii) promote conservation; and*
 - iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.**

The Constitution accords national and provincial government concurrent legislative competence in terms of most functions of relevance to biodiversity conservation. However, national parks, botanical gardens, and marine resources are an exclusively national competence. In terms of the Constitution, it is also the role of central government to administer international treaties. Thus it is the responsibility of the Department of Environmental Affairs and Tourism to formulate general policy concerning the conservation and use of biodiversity, the implementation of which will be undertaken by different government institutions within central, provincial, and local spheres.

1.5. Major Concerns Expressed

Throughout this consultative process there has been remarkable consensus on the issues needing to be addressed by this policy. In many cases these concerns are not unique to biodiversity and span across the environmental spectrum.

For example, the fragmented, polarised, and inefficient administrative and legislative structures created by apartheid resulted in no fewer than 17 government departments having a primary responsibility for nature conservation prior to the April 1994 election. This situation did not improve with the establishment of new provinces and government structures. Divided responsibilities, together with a duplication of effort, a profusion of laws, and most importantly a lack of coordination, have been major factors hampering the effective conservation of biodiversity. Aggravating this has been a lack of integration of biodiversity considerations into national decision-making, weak political will with regard to environmental conservation, and the insufficient and declining allocation of resources to conservation. Over and over again, the need to link biodiversity conservation to the needs of South Africa's people has been highlighted as a major concern, as well as the importance of integrating conservation into an overall strategy for conserving and using natural resources sustainably. These concerns have been foremost in informing the development of this policy.

1.6. Reader's Guide to the Policy

The policy which follows is divided into three main sections.

- Chapter 2 outlines the Vision, Mission and Principles guiding the formulation of the policy. Fourteen principles are described, resulting from the consultative process. Together these inform, guide and provide a context to South Africa's biodiversity policy and strategy (see Figure 2, page 9).
- Chapter 3 contains South Africa's biodiversity policy and strategy, and is divided into six goals. These are to:
 1. Conserve South Africa's biodiversity;
 2. Use biological resources sustainably and minimise adverse impacts on biodiversity;
 3. Ensure that benefits derived from the use and development of South Africa's genetic resources serve national interests;
 4. Expand the human capacity to conserve biodiversity, to manage its use, and to address factors threatening it;
 5. Create and implement conditions and incentives that support the conservation and sustainable use of biodiversity; and
 6. Promote the conservation and sustainable use of biodiversity at the international level.

Each of these goals in turn comprises a number of relevant policy objectives and strategies required to attain these objectives.

Because of the inter-related nature of many of the themes discussed, it has been necessary to repeat some of the key provisions of the policy under different goals and objectives.

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- Chapter 4 describes the implementation of the policy, including the roles of key players, the legislative framework, institutional changes required, funding, and priority actions to be pursued.
 - A set of Appendices is also included, containing a glossary of terms (Appendix 1) and the full text of the Convention on Biological Diversity (Appendix 2).

CHAPTER 2.

THE VISION, MISSION AND PRINCIPLES GUIDING A BIODIVERSITY POLICY AND STRATEGY FOR SOUTH AFRICA

2.1 The Constitution

The Vision, Mission and Principles articulated below are underpinned and guided by South Africa's new Constitution which provides within its Bill of Rights that everyone has the right:

- a) *to an environment that is not harmful to their health or well-being; and*
- b) *to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:*
 - i) *prevent pollution and ecological degradation;*
 - ii) *promote conservation; and*
 - iii) *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*

2.2. A Vision for South Africa

A prosperous, environmentally conscious nation, whose people are in harmonious coexistence with the natural environment, and which derives lasting benefits from the conservation and sustainable use of its rich biological diversity.

2.3. The Mission of Government

Government will strive to conserve South Africa's biological diversity and to thereby maintain ecological processes and systems whilst providing lasting development benefits to the nation through the ecologically sustainable, socially equitable, and economically efficient use of biological resources.

2.4. Guiding Principles

In the context of the Vision and Mission, the following inter-related principles will guide the application, assessment and further development of the biodiversity policy and strategy.

2.3.1. Intrinsic Value. All life forms and ecological systems have intrinsic value.

2.3.2. Duty of Care. All people and organisations should act with due care to conserve and avoid negative impacts on biodiversity, and to use biological resources sustainably, equitably and efficiently.

2.3.3. Sustainable Use. The benefits derived from the use of South Africa's biological resources are dependent upon: (a) such resources being used at a rate within their capacity for renewal; (b) maintaining the ecological integrity of the natural systems which produce such resources; (c) minimising or avoiding the risk of irreversible change induced by humans; (d) adequate investments being made to ensure the conservation and sustainable use of biodiversity; and (e) avoiding or minimising the adverse impacts of the use of non-renewable resources on biodiversity.

2.3.4. The Fair and Equitable Distribution of Benefits. Benefits arising from the use and development of South Africa's biological resources will be fairly and equitably shared. The rights to use biological resources will be equitably allocated, and will recognise (a) that it may be necessary to limit access in order to ensure conservation and sustainable use; (b) that within the constraints of sustainable use, the socio-economic upliftment of disadvantaged communities is an important criterion upon which decisions will be based; (c) that where peoples' historical rights of access to natural resources have been removed or constrained this should be reviewed and redressed in line with the other guiding principles; and (d) the Constitutional rights of owners of biological resources.

2.3.5. Full Cost-Benefit Accounting. Decision-makers and users of biological resources will be guided by economic approaches which assess the full social and environmental costs and benefits of projects, plans and policies that impact upon biodiversity, and which internalise costs borne to the environment and to society. These will reflect both the economic loss that results when biodiversity is degraded or lost, as well as the value gained from conserving the resource. Generators of waste will bear the environmental, social and economic costs to society of resulting pollution, and the responsibility for redressing any consequences.

2.3.6. Informed and Transparent Decision-Making. Decisions relating to the conservation and use of biodiversity in South Africa will be based upon the best applicable knowledge available. In cases where a lack of information is evident, steps will be taken to collect information necessary to assess the conservation and sustainable use of biodiversity. Where appropriate, information necessary to ensure the conservation and sustainable use of biodiversity will be readily available in an accessible form, and will enable people to work with, and obtain the information they need for informed participation in biodiversity management.

2.3.7. The Precautionary Principle. Where there is a threat of significant reduction or loss of biological diversity but inadequate or inconclusive scientific evidence to prove this, action should be considered to avoid or minimise threats.

2.3.8. Accountability and Transparency. Those making and implementing decisions relating to the conservation and use of biodiversity in South Africa will be accountable to the public for their actions through explicit, justifiable processes.

2.3.9. Subsidiarity. Governance responsibilities belong at the level at which they can be most effectively carried out.

2.3.10. Participation. Interested and affected individuals and groups will have an opportunity to participate in decisions about the ways in which biological resources are conserved and used.

2.3.11. Recognition and Protection of Traditional Knowledge, Practices and Cultures. Traditional knowledge, practices and cultures supporting the conservation and sustainable use of biodiversity will, where possible, be recognised, protected, maintained, promoted, and used with the approval and involvement of those who possess this knowledge. Benefits arising from the innovative use of traditional knowledge of biological diversity will be equitably shared with those from whom knowledge has been gleaned.

2.3.12. Coordination and Cooperation. Because biodiversity transcends political, institutional and social boundaries, an enabling framework will be provided for the future coordination and cooperation of biodiversity-related activities in South Africa, in the southern African sub-region, and globally. Coordination will also be ensured between other plans, programmes and policies which have implications for the conservation of biodiversity and use of biological resources.

2.3.13. Integration. The conservation and sustainable use of biodiversity will be integrated strategically at all levels into national, provincial, local and sectoral planning, programme, and policy efforts (*e.g.* forestry, agriculture, fisheries, land reform, industry, education, health, mining, *etc.*) to implement the goals and objectives of the policy effectively.

2.3.14. Global and International Responsibilities. South Africa has a shared responsibility for ensuring the conservation and sustainable use of biodiversity beyond our borders, and for transboundary equity.

2.3.15. Evaluation and Review. The policy will not be an end in itself, but rather part of an iterative process which will be monitored and reviewed regularly. Strategies adopted will be responsive to social, economic and environmental change, as well as to scientific and technological advances, but will have due concern for maintaining continuity.

CHAPTER 3.

A BIODIVERSITY POLICY AND STRATEGY FOR SOUTH AFRICA

Introduction

The South African Government has three overriding priorities:

- the eradication of poverty;
- the sustainable development of its economy; and
- the social development of its people.

These priorities, together with the national environmental policy presently being formulated, provide the context within which consideration will be given to achieving the three objectives of the Convention on Biological Diversity:

- the conservation of biological diversity;
- the sustainable use of biological resources; and
- the fair and equitable sharing of benefits arising from the use of genetic resources.

In addition to fulfilling these objectives, Government commits itself to a biodiversity policy and strategy that will promote the reconstruction and development of South Africa through:

- ensuring that the essential ecosystem services and biological resources required to meet basic human needs are protected and maintained;
- not restricting economic development unnecessarily, and ensuring that such development is sustainable;
- enhancing the provision of jobs related to the conservation of biodiversity and sustainable use of biological resources;
- ensuring that opportunities derived from the conservation of biodiversity and sustainable use of biological resources favour the poor;
- enhancing the development of human resources necessary to conserve biodiversity and use biological resources sustainably; and
- increasing participation in the institutions of civil society engaged in conserving and using biodiversity.

GOAL 1:**CONSERVE THE DIVERSITY OF LANDSCAPES, ECOSYSTEMS, HABITATS, COMMUNITIES, POPULATIONS, SPECIES, AND GENES IN SOUTH AFRICA**

This section describes South Africa's plans for meeting a key obligation of the Convention - the conservation of biological diversity.

The term *conservation* has in the past been used broadly to include protection as well as use, maintenance, restoration and enhancement of the natural environment. However, the Convention on Biological Diversity uses *conservation* in a different way in that it refers both to the "conservation of biological diversity", and the "sustainable use of its components". This reflects the desire of developing countries to underscore the importance of sustainable use. For the purposes of this policy, the language of the Convention has been used, and a separate section, described in Goal 2, articulates a policy and strategy specifically concerning the *sustainable use* of biological resources, and avoiding or minimising adverse impacts on biodiversity.

This section (Goal 1), refers to those aspects of the policy concerning the *conservation* of biodiversity, both inside and outside of protected areas. It includes measures required to protect, maintain, rehabilitate, restore, and enhance biodiversity and should be read in conjunction with Goal 2.

South Africa's approach to conserving its remarkable diversity of landscapes, ecosystems, habitats, communities, populations, species and genes in the country, has eight main components:

1. Identifying important components of biodiversity and threatening processes;
2. Maintaining and strengthening existing arrangements to conserve South Africa's indigenous biodiversity, both in and out of protected areas;
3. Establishing and managing efficiently a representative and effective system of protected areas;
4. Promoting environmentally sound and sustainable development in areas adjacent to or within protected areas;
5. Restoring and rehabilitating degraded ecosystems, and strengthening and further developing species recovery plans where appropriate;
6. Controlling, eradicating and preventing the introduction of harmful alien species which threaten biodiversity;
7. Regulating the transfer, handling, use and release of genetically modified organisms; and
8. Strengthening measures for the conservation of biological diversity outside of natural habitats (*ex-situ* conservation).

In pursuing this approach, Government recognises:

- that biological diversity is best conserved in the wild (*in-situ*), through the conservation and restoration of ecosystems and natural habitats, and the maintenance and recovery of viable populations of species in their natural surroundings;
- that *ex-situ* measures will be implemented primarily for the purpose of complementing *in-situ* measures; and

- that an integrative approach will be the primary framework for action to address threats to biological diversity, and to establish priorities for its conservation. This means that conservation efforts will focus not only upon relatively “natural” landscapes, but will include areas modified by human activities, and will seek to enhance the contribution which biodiversity makes to human welfare.

1.1. IDENTIFICATION

See also: Objective 4.2 and Sections 4.2.1 (Research), 4.2.2 (Inventories), 4.2.3 (Monitoring and Evaluation), and 4.2.4 (Data and Information).

Policy objective 1.1.

Identify important components of biodiversity and threatening processes.

Policy and Strategy

One of the most fundamental steps towards achieving the goals articulated in this policy requires the identification of important components of biodiversity, and threatening processes. There already exists considerable knowledge in South Africa concerning aspects of the country's biodiversity, but this information needs to be gathered, ordered, and strategically used. Information also exists regarding processes or activities that have adverse impacts on biodiversity, but in many instances this is patchy, inconclusive, and not tailored towards facilitating effective management.

To achieve the described objective, Government will take a systematic approach towards the identification of important components of biodiversity and threatening processes, and will, through undertaking a survey of existing knowledge, focus upon addressing gaps in knowledge whilst continuing to support activities relevant to achieving the objective.

In particular, Government, in collaboration with relevant interested and affected parties, undertakes to:

1. Identify, using biological, social and economic criteria, components of biodiversity important for its conservation and sustainable use. These components will include:
 - **Ecosystems and habitats** that contain high diversity; that contain large numbers of endemic or threatened species; that are relatively “pristine”; that are important nursery or spawning areas; that are under particular threat; that are important for endangered or migratory species; that adjoin conserved ecosystems and habitats; that are of social, economic, cultural or scientific importance; or that are unique, representative of or associated with key evolutionary, biological or other life-supporting processes;
 - **Species and communities** that are rare or threatened; that are of medicinal, agricultural, or other economic value; that are wild relatives of domesticated or cultivated species; that are

directly used for subsistence purposes (*e.g.* fuelwood, building materials); that have social, scientific or cultural importance; or that are important for research into the conservation and sustainable use of biodiversity, such as indicator species; and

- **Described genomes and genes** of social, scientific or economic importance.
2. (a) Identify processes or activities that have or are likely to have significant adverse impacts on terrestrial, aquatic, and marine and coastal biodiversity;
 - (b) Monitor the effects of these processes and activities, in conjunction with the approaches described in Objective 4.2 (Section 4.2.3); and
 - (c) Undertake the research necessary to improve understanding of the consequences of threatening processes or activities on ecological functions and processes, and other components of terrestrial, aquatic, and marine and coastal biodiversity.
3. Develop a mechanism to manage and collate this information, to place it in the public domain, and to ensure that decisions taken upon the best applicable knowledge available (See Objective 4.2, Section 4.2.4).

1.2. BIODIVERSITY CONSERVATION



Policy objective 1.2.

Maintain and strengthen existing arrangements to conserve South Africa's indigenous biodiversity, both inside and outside of protected areas.

Policy and Strategy

South Africa has a substantial body of law to conserve biodiversity, especially within protected areas and for several plant and vertebrate species. However, past approaches to biodiversity conservation have not given adequate attention to the conservation of landscapes and ecosystems outside of protected areas, and have neglected to consider lesser known groups such as invertebrates, fungi, and microorganisms.

Through this policy and the introduction of appropriate measures, Government intends to adopt a more holistic and coordinated approach towards the conservation of biodiversity.

The difficulties encountered in enforcing conservation law in South Africa are a matter of great concern. Government supports the coordinated development of a law enforcement strategy, effective deterrents, and the strengthening of required capacity, but will balance this with the provision of incentives to encourage adherence to the law.

To achieve the objective, Government, in collaboration with interested and affected parties, will:

1. (a) Conserve components of biodiversity identified by Objective 1.1 through a variety of mechanisms such as legislation, planning controls, guidelines, and protected area

designations, giving priority to components of biodiversity requiring urgent protective measures;

- (b) Consolidate, coordinate and improve existing legislation and regulations wherever possible and appropriate in order to eliminate duplication, and to avoid conflicting interpretations and implementation.
 - (c) Introduce legal measures (See Chapter 4) and incentives (See Objective 5.2) to conserve important ecosystems, habitats, and landscapes outside of protected areas, including rangelands and their associated vegetation and indigenous wildlife resources;
 - (d) Promote an ecological management approach to planning, whereby conservation is proactively incorporated into land-use plans as a specific land use (See also Objective 2.3); and
 - (e) Facilitate the development of appropriate legislation to achieve uniform legal coverage for the protection of threatened species and the regulation of trade of all CITES-listed species, in addition to threatened species listed nationally and provincially.
2. (a) Strengthen existing support for research on the improved understanding of the structure, function and composition of South Africa's terrestrial, aquatic, and marine and coastal ecosystems (see also Objective 4.2); and
 - (b) Improve knowledge of and take appropriate action to conserve poorly known groups such as invertebrates, fungi and microorganisms.
 3. Promote and support measures to manage conflict arising from the conservation and use of biological resources.

1.3. PROTECTED AREAS



Policy objective 1.3.

Establish and manage efficiently a representative and effective system of protected areas.

Protected Areas in South Africa

A "protected area", as defined by the Convention is "a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives". Within this definition, the purposes for which protected areas are managed vary considerably, and different classification systems apply in different countries. South Africa presently contains 21 types of protected areas which can be grouped under six internationally recognised management categories (see Table I, page 21). These areas are administered by many different bodies, including the National Parks Board; the Department of Water Affairs and Forestry; the Department of Environmental Affairs and Tourism; the South African National Defence Force; the National Botanical Institute; provincial conservation agencies; numerous local authorities; and an assortment of private and public landowners who subscribe to various conservation

schemes. Ten Acts of Parliament and 13 provincial Ordinances and Acts control protected areas in South Africa (see Table II, page 22).

Terrestrial Protected Areas

South Africa's system of terrestrial protected areas is well developed, and it is in such areas that biodiversity conservation has been focused. The 422 formally protected areas constitute some 6% of the land surface area, and although the extent to which viable populations are conserved in such areas is not known, about 74% of plant, 92% of amphibian and reptile, 97% of bird, and 93% of mammal species of South Africa are estimated to be represented in the present protected area system. However, this does not imply the conservation of the genetic diversity within these species. Moreover, there are many gaps, and the existing system does not adequately protect the lowland fynbos, succulent karoo, Nama karoo, highveld grassland, and thicket biomes of South Africa (see Figure 3, page 19). Furthermore, many of the existing protected areas are small, often isolated from one another, and separated by large areas of mostly transformed land. Aggravating this situation is the fact that protected areas have been managed as islands of biodiversity rather than as part of a holistic land-use policy. Of concern is the fact that the existing system has arisen through a largely *ad hoc* process, rather than being part of a deliberate conservation strategy.

Wetlands

Wetland conservation is extremely poor in South Africa and the majority of wetlands fall outside of protected areas. Exceptions to this include the 15 Ramsar Sites in the country, which are recognised in terms of the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) and protected through various laws. These total some 488 859 hectares.

Marine Protected Areas

Several marine protected areas are located along South Africa's extensive coastline, representing most marine biogeographic regions, and including two of the largest "no-take" reserves in the world. However, as is the case for terrestrial protected areas, there has been no overall planned development of marine reserves, a large number being either poorly positioned or inadequately policed. Furthermore, existing marine protected areas do not protect the full range of coastal and marine habitats, such as sandy beaches, estuaries, dunes, and different types of rocky shore.

Figure 3. Conservation of South African Biomes⁵

Biome	Number of vegetation types	Proportion of South Africa	Proportion conserved in South Africa
Forest	3	0.59%	17.90%
Fynbos			
<i>Fynbos</i>	5	3.39%	20.52%
<i>Renosterveld</i>	5	2.90%	1.67%
Grassland	15	24.26%	2.52%
Nama-Karoo	6	24.41%	0.57%
Succulent Karoo	4	6.77%	2.82%
Savanna	25	34.24%	10.15%
Thicket	5	3.44%	4.5%

⁵ Calculated from data in *Vegetation of South Africa, Lesotho and Swaziland*, edited by A.B. Low and A.G. Rebelo. Published by the Department of Environmental Affairs and Tourism, January 1996.

Policy and Strategy

Government recognises that South Africa's protected area system is an asset of unsurpassed value, which in addition to conserving biodiversity generates substantial economic benefits through tourism. Of concern is the fact that neither terrestrial nor marine protected areas in South Africa form part of a planned network. Furthermore, the management of such areas is poorly coordinated between the range of responsible authorities, resulting in variable and often conflicting policies being applied. The need to strengthen and rationalise this system, and so establish an effective, efficient, and representative protected area system is considered by Government to be an issue of primary importance. Several steps have been taken in this regard, notably the establishment of a working group under the Sub-Committee on Biodiversity of the Committee for Environmental Coordination, to coordinate conservation efforts between national and provincial conservation agencies, and the establishment of a Marine Reserve Task Group, under the auspices of the South African Network for Coastal and Oceanographic Research (SANCOR), to develop a revised policy on marine protected areas.

Government will build on these initiatives and, in collaboration with interested and affected parties, will:

1. Establish a national cooperative programme to strengthen efforts to identify terrestrial, aquatic, and marine and coastal areas that support landscapes, ecosystems, habitats, populations, and species which contribute or could contribute to South Africa's system of representative protected areas. This will take into consideration the categories identified by Objective 1.1, the desirability of achieving at least 10% representation of each habitat and ecosystem type within each biome, and the principle of complementarity, meaning the extent to which components of biodiversity are represented in other areas. Government will involve all protected area agencies and all those with the necessary expertise in this initiative.
2. Develop a comprehensive plan of action to strengthen South Africa's protected area system through a variety of mechanisms such as the purchasing of new land, contractual agreements, land exchanges, the rationalisation of existing protected areas and state land, and the streamlining of legislation. In so doing, it will give recognition to the need to accommodate a diversity of categories of protection, ranging from strict preservation through to controlled resource harvesting and extraction. The plan will take into account the need for diverse, but coordinated and appropriate levels of control - from national through to provincial and local level. Concomitant with these actions will be the development of management plans for all protected areas, including an evaluation of existing boundaries and management arrangements. Funding will be sought from various sources (see Chapter 4) to ensure that these actions receive priority attention.
3. Ensure the involvement of local communities and other interested and affected parties in decisions concerning the designation of new protected areas, the adjustment of protected area boundaries, and the development and implementation of management plans. Such involvement is crucial to the development of an effective and integrated protected area system.
4. Encourage private landowners to continue to participate in voluntary conservation schemes such as conservancies, private nature reserves and the South African Natural Heritage Programme, and in co-operative management partnerships such as biosphere reserves and contractual parks.

Table I. IUCN Protected Area Categories⁶

CATEGORY	NAME	MANAGEMENT OBJECTIVE	SOUTH AFRICAN LEGAL OR OTHER EQUIVALENT CATEGORY⁷
Category Ia	Scientific Reserves	Managed mainly for scientific research and monitoring	<ul style="list-style-type: none"> • Special nature reserves • Wilderness areas
Category Ib	Wilderness Area	Managed mainly for wilderness protection, subsistence, and recreation	<ul style="list-style-type: none"> • Special nature reserves • Wilderness areas
Category II	National Parks and Equivalent Reserves	Managed mainly for ecosystem protection and recreation	<ul style="list-style-type: none"> • National parks • Provincial parks and nature reserves • Indigenous state forests
Category III	Natural Monuments and Areas of Cultural Significance	Managed mainly for conservation of specific natural or cultural features	<ul style="list-style-type: none"> • Natural monuments • Monuments • Botanical gardens • Zoological gardens • Natural heritage sites • Sites of conservation significance
Category IV	Habitat and Wildlife Management Areas	Managed mainly for conservation through management intervention	<ul style="list-style-type: none"> • Provincial, local, and private nature reserves • Conservancies
Category V	Protected Land and Seascapes	Managed mainly for land and seascape conservation and recreation	<ul style="list-style-type: none"> • Protected natural environments • Natural resource areas • Scenic landscapes • Urban landscapes
Category VI	Managed Resource Protected Area	Managed mainly for the sustainable use of natural ecosystems	<ul style="list-style-type: none"> • Mountain catchment areas

⁶ IUCN 1994. *Guidelines for Protected Area Management Categories*. World Conservation Monitoring Centre, Cambridge and IUCN Commission on National Parks and Protected Areas. IUCN, Gland.

⁷ As described in the Government Gazette of 9 May 1994 Notice 449.

Table II. The Management of Protected Areas in South Africa ⁸

TYPE OF PROTECTED AREA	LEGISLATION	ADMINISTRATION
National Park	National Parks Act 57 of 1976	National Parks Board
Lake Area	Lake Areas Development Act 139 of 1975	National Parks Board
Mountain Catchment Area	Mountain Catchment Areas Act 63 of 1970	Assigned to provinces
Protected Natural Environment	Environment Conservation Act 73 of 1989	Assigned to provinces
Special Nature Reserve	Environment Conservation Act 73 of 1989	Assigned to provinces
Limited Development Area	Environment Conservation Act 73 of 1989	Delegated to local authority / government institution
National Botanical Garden	Forest Amendment Act 1991	National Botanical Institute
State Forest	Forest Act 122 of 1984	DWAF: delegated to provinces
Forest Nature Reserve and Wilderness Area	Forest Act 122 of 1984	DWAF delegated to provinces
National Monument	National Monuments Act 28 of 1969	National Monuments Council and provinces
Conservation Area	National Monuments Act 28 of 1969	National Monuments Council and provinces
Defence Area	Defence Act 44 of 1957	South African National Defence Force
Marine Reserve	Sea Fishery Act 12 of 1988	DEAT : Directorate of Sea Fisheries, and provinces in respect of coastal zone and specified resources
Restricted Area	Sea Fishery Act 12 of 1988	DEAT: Directorate of Sea Fisheries, and provinces in respect of coastal zone and specified resources
Most South African islands	Sea Birds and Seals Protection Act 46 of 1973	DEAT: delegated to provinces in respect of sea birds
Provincial, Local and Private Nature Reserves	Various provincial ordinances	9 provincial administrations, numerous local authorities, private landowners
Ramsar Site	No legal status (Proposed Wetland Conservation Act)	DEAT and conservation authorities
Private Conservancies	No legal status	Farmers
Biosphere Reserves	No legal status	Conservation authority / neighbours
Sites of Conservation Significance	No legal status	Private landowners
Natural Heritage Sites	Not legally enforceable	Private landowners

⁸ Note that DEAT refers to the Department of Environmental Affairs and Tourism, and DWAF the Department of Water Affairs and Forestry.

1.4. ENVIRONMENTALLY SOUND AND SUSTAINABLE DEVELOPMENT ADJACENT TO PROTECTED AREAS

See also: Sections 2.1 (Sectoral and Cross-sectoral Approaches), 2.2 (Using Biological Resources Sustainably and Avoiding or Minimising Adverse Impacts on Biological Diversity), 2.3 (Land-use Planning and Environmental Assessment), and 2.4 (Adopting Sustainable Lifestyles).

Policy objective 1.4.

Promote environmentally sound and sustainable development in areas adjacent to or within protected areas, with a view to furthering protection of these areas

(The promotion of sustainable development throughout the landscape is considered in Goal 2).

Policy and Strategy

Urgent attention is required to ensure that biodiversity is conserved not only within protected areas, but across the landscape, and that sustainable development is promoted throughout South Africa. This is a fundamental component of Goal 2, which articulates the manner in which sustainable development is to be promoted throughout the whole country.

However, a special case can be made for paying attention to areas adjacent to or within protected areas, given that activities occurring in such areas may be critical to the protected area's success. Furthermore, the ecological landscape is often a continuum between designated protected areas and surrounding regions. The viability of protected areas is thus dependent upon the extent to which such areas are socially, economically, and ecologically integrated into the surrounding region. This fact is also recognised by the Convention, which has a specific provision aimed at promoting sustainable development in areas adjacent to protected areas.

These issues are especially pertinent to protected areas in South Africa, several of which fall within some of the most populous and poverty-stricken parts of the country. As protected areas are often centres of economic activity, social and economic conditions within and outside of these areas contrast starkly. These discrepancies are aggravated by the fact that in the past some protected areas were established at severe cost to communities. In the creation of protected areas, many communities were forcibly removed without adequate compensation.

Furthermore, a "fences and fines" approach resulted in people being denied access to resources upon which they depended. Aggravating these circumstances is the fact that protected areas have remained inaccessible to the majority of South Africa's people, and are perceived to be playgrounds for a privileged elite, from which few benefits are derived. These imbalances are well recognised, and are in some instances being redressed by conservation and other agencies.

Government will bolster such initiatives, and in collaboration with interested and affected groups will:

1. Develop and introduce appropriate strategies, mechanisms and incentives to integrate protected areas within the broader ecological and social landscape, and encourage conservation in adjacent private and communal areas. This may include the establishment of biosphere reserves; buffer zones; community-based wildlife management schemes; multiple use areas; tourism plans; development projects; or the introduction of conservation grants and other economic incentives.
2. Support and promote activities adjacent to protected areas that are compatible with and which complement the objectives of the protected area (see also Objectives 2.2 and 2.3).
3. Support the development of community-based wildlife management initiatives as part of a broader set of approaches to land-use planning and developing local sustainable development strategies.
4. Promote the development of partnerships between conservation agencies, community organisations, NGOs, and private entrepreneurs for purposes of planning and managing the use of resources within and outside of protected areas, and optimising benefits for local people.
5. Enhance the capacity of communities residing in or adjacent to protected areas to participate in protected area management through providing appropriate training and education, and through recognising local expertise and traditional institutions.
6. Take steps to avoid or minimise damage caused to people and property by wildlife (see also Objective 1.2).
7. Seek innovative ways of improving benefit flows to people in and around protected areas through:
 - (a) promoting local and social development (*e.g.* using local producers and labour as far as possible, facilitating joint venture schemes, providing community services, providing environmental education and opportunities within protected areas, promoting community management and co-management of protected areas);
 - (b) designating areas for sustainable resource use; and
 - (c) facilitating where appropriate the development of compensation agreements with those who have lost access to resources or who have suffered damage caused by wildlife.
8. Through the Land Restitution Programme, and in accordance with the Constitution of South Africa and the Restitution of Land Rights Act 22 of 1994, facilitate the settlement of land claims, taking into account the intrinsic biodiversity value of the land, and seeking outcomes which will combine the objectives of restitution with the conservation and sustainable use of biodiversity.

1.5. REHABILITATION

Policy objective 1.5.

Restore and rehabilitate degraded ecosystems, and strengthen and further develop species recovery plans where practical and where this will make a significant contribution to the conservation and sustainable use of biological diversity.

Rehabilitation Efforts in South Africa

South Africa's land- and seascapes have changed dramatically over the past few centuries, largely through human settlement and associated activities. Often these activities have resulted in the degradation or loss of ecosystems, and in some instances in the extinction of species. Our recent history of apartheid planning led to particularly marked effects in the former homelands, through creating densely populated pockets of land, which are now sites of severe soil erosion, overgrazing and resource depletion. Previous policies also encouraged unsustainable land-use practices by providing subsidies to farmers occupying marginal lands.

Over the years there have been various private and public sector efforts to rehabilitate degraded areas, primarily to restore the productivity of agriculturally degraded lands on large commercial farms, but also to rehabilitate previously mined areas. Within protected areas, efforts to reintroduce threatened species and promote their recovery have been considerable, with off-site conservation approaches such as captive breeding and plant propagation being successfully used to increase populations of threatened species. However, to date there has been no overall national approach to rehabilitation which aims to restore ecosystem functioning and biodiversity.

Policy and Strategy

Government recognises that the rehabilitation of degraded ecosystems in South Africa is a major task, requiring the commitment of significant resources from both national coffers and the private sector. For the purposes of this policy, and within the confines of existing rehabilitation directives, Government will require that rehabilitation actions be prioritised on the basis of the contribution that restored areas can make to the conservation and sustainable use of biodiversity. In particular, rehabilitation actions will not be emphasised to the detriment of achieving Objectives 1.1 and 1.2.

Within this context, Government, in collaboration with interested and affected parties, will:

1. Develop a programme to rehabilitate degraded systems of national concern. This will:
 - (a) identify key sites for restoration, based upon biological and socio-economic criteria, and in accordance with Objective 1.1, and develop and implement rehabilitation plans for identified sites;
 - (b) link remedial action to the provision of jobs, skills and opportunities for the poor and disadvantaged wherever possible and appropriate;
 - (c) support research to enhance techniques to restore biodiversity in degraded systems;

- (d) monitor the effectiveness of rehabilitation measures; and
 - (e) continue to regulate and minimise adverse impacts of harmful activities on biodiversity.
2. Continue to conserve and restore populations of threatened species by:
 - (a) developing appropriate legislation, and undertaking additional measures where necessary;
 - (b) developing tools to enable their identification;
 - (c) developing and implementing recovery plans for species at risk; and
 - (d) promoting the use and involvement of off-site (*ex-situ*) conservation facilities and expertise where necessary.
 3. Require rehabilitation measures to be undertaken as an integral part of environmental impact assessments, to minimise potential negative impacts and to enhance possible positive impacts on biodiversity.
 4. Address concerns relating to the genetic contamination and loss of genetic variability amongst populations.

1.6. ALIEN ORGANISMS

Policy objective 1.6.

Prevent the introduction of potentially harmful alien species and control and eradicate alien species which threaten ecosystems, habitats or species.

Alien Organisms in South Africa

Alien organisms are plants, animals and microorganisms which do not naturally occur in an area, and which are deliberately or accidentally introduced by humans to ecosystems outside of their natural range. This may be at a local level, where species are moved from one type of habitat to another, or at a global level, where species are introduced into different continents or regions. Alien organisms can be divided into (a) those that are problematic and harmful, in that they negatively impact on biodiversity; and (b) those that are benign and in many instances serve useful purposes. This policy focusses upon alien organisms which threaten ecosystems, habitats or species.

Many alien plant and animal species have been introduced into South Africa over the years. A large proportion of such introductions have been deliberate, for purposes of agriculture, forestry, or even conservation. Indeed, much of South Africa's agriculture and forestry production depends upon species that originated from other countries. These organisms provide important economic and social benefits, but many have become invasive, causing serious ecosystem degradation, disrupting ecological processes, and resulting in species extinctions and possible reductions in genetic diversity through hybridisation. In the Cape Peninsula, for example, invasive alien plants are chiefly responsible for the highest

concentration of threatened taxa in the world. Elsewhere in the country the invasion of water catchment areas by alien plants has been responsible for reducing water availability - a serious concern in a drought-stricken country such as South Africa.

Introduced animals have also reduced South Africa's biodiversity, a few examples being the Argentinian ant, the Himalayan thar, the European starling, the house sparrow and the black rat, and on South Africa's islands, house mice, rabbits, and feral domestic cats. Some of the most drastic impacts of invasive animal species have been recorded in South African rivers, where alien fish, and to a lesser extent invertebrate and reptile species, have altered habitats and successfully outcompeted native fauna. Up to 60% of the threatened endemic freshwater fish of South Africa may be threatened by introduced fish species such as trout, carp and bass. Similarly in the marine environment, the accidental introduction of alien species through ballast water or on ship hulls has resulted in a number of alien species occupying our shores and coastal waters, in some instances displacing local species.

Policy and Strategy

Government is acutely aware of the adverse impacts of harmful alien organisms on biodiversity and is committed to controlling and regulating the introduction and spread of such organisms. Several measures are in place which support this commitment, including extensive legislation, as well as numerous management and research programmes. An RDP project is also underway to clear invasive alien vegetation as part of a water conservation campaign and job-creation scheme.

Despite these measures, Government recognises that many past efforts at control have been unsuccessful, a major problem being the fact that responses have been reactive, with actions taken only after invasive alien species have become a problem. This *ad hoc* approach has not been cost-effective, and has resulted in drastic impacts on biodiversity. To redress this, Government will adopt a proactive, preventative and precautionary approach to control the introduction and spread of alien organisms. This approach will take into consideration the need to balance the risks associated with introducing and releasing alien organisms with the potential social, economic and environmental benefits derived therefrom.

To achieve this objective, Government, in collaboration with interested and affected parties, will:

1. (a) Review, streamline, and if necessary strengthen existing legislation to control the introduction and spread of potentially harmful alien organisms. Actions will be taken to improve the effectiveness of legislation and ensure consistency; and
- (b) Strengthen the enforcement and effectiveness of existing punitive measures to control the introduction and spread of potentially harmful alien organisms.
2. Develop a regulatory procedure for the introduction of alien organisms into South Africa, whereby the potential risks of introduction are comprehensively assessed against intended benefits prior to introduction. This assessment will be followed by the adoption of appropriate mitigatory or preventative measures.
3. Develop control and eradication programmes, and provide ongoing support to existing programmes, based on a priority-rating system and in relation to costs and resources. This will consider threats posed to biodiversity, as well as social, economic, and environmental costs and benefits derived from using and removing identified organisms. The planning of

intensive mechanical clearing operations will take account of job creation schemes and will provide for regular follow-up.

4. Prevent wherever feasible the unintentional introduction of alien organisms to South Africa.
5. Develop a national policy on the inter- and intra-provincial translocation and inter-basin transfer of species, including the updating of lists of prohibited and approved taxa.
6. Promote the use of local, indigenous species in rehabilitation and revegetation schemes.
7. Provide incentives to landowners to control or eradicate alien organisms identified as threatening biodiversity.
8. Strengthen, support and coordinate the efforts of existing institutions and programmes to detect the early establishment of invasive alien organisms, and to catalogue and describe such invasions.
9. Support and strengthen the development of biological and other control methods for alien organisms that threaten biodiversity.
10. Improve understanding concerning the impacts of alien organisms on biodiversity.
11. Improve public education and awareness concerning the risks posed by the planting or illegal importation of alien species, and identify actions which can be taken to avoid such risks or to control the spread of alien organisms.
12. Improve capacity amongst implementing agencies to regulate the introduction, control and eradication of alien organisms that threaten biodiversity.
13. Negotiate and liaise with neighbouring countries to maximise commonalities and minimise conflicts between policies, legislation, and practices relating to alien organisms that threaten biodiversity.

1.7. GENETICALLY MODIFIED ORGANISMS

Policy objective 1.7.

Regulate the transfer, handling, use and release of genetically modified organisms in order to minimise the potential risks to biodiversity and human health.

Biotechnology and Genetically Modified Organisms

For centuries living organisms have been manipulated using traditional techniques such as fermentation, classical plant breeding and artificial insemination to produce new breeds, food, medicines, or other products. Although these and other newer techniques are still practised, methods have become increasingly sophisticated during the past twenty years, with the development of a wide range of novel molecular biotechnologies. The most significant of these has been recombinant DNA or 'gene transfer' technology, which makes it possible to cut DNA from any source into fragments, and to recombine genes from widely different organisms to yield forms with specific characteristics. Traits such as herbicide resistance can be incorporated into crops to increase yields; hormones created to increase milk yield in cows; and microbes engineered to clean up oil-spills. This is what is commonly referred to as 'genetic engineering'. *Genetically modified organisms* are organisms whose genetic makeup has been altered by the insertion or removal of small fragments of genes or genetic material (e.g. DNA, RNA, plasmids) in order to create or enhance desirable characteristics.

Modern biotechnology has far reaching applications for agriculture, chemical processing, human and animal health, and environmental management, and is one of the fastest growing industries in the world. However, the release of genetically modified organisms into the environment raises many questions about safety, ecological and agricultural impacts, genetic diversity, socio-economic effects, and the appropriateness of using genetically engineered organisms in particular applications. Many concerns relate to the nature of the risks involved, which are often difficult to predict and determine. Complex relationships exist between inserted genes and other genes, and between genes and the biochemistry of cells and organisms. If not controlled and monitored, genetic engineering risks triggering a cascade of uncertain effects and reducing natural biodiversity.

The South African biotechnology industry is relatively well-developed, especially with regard to traditional technologies such as alcohol fermentation and bioleaching. Considerable attention has additionally been given to developing the research capacity for conventional and recombinant DNA technologies, although the commercial application of technologies has not developed to the same extent. To date, there have been five field trials with genetically modified organisms permitted in South Africa. The need to regulate the industry to minimise and avoid adverse impacts is widely recognised by both industry and other stakeholders. However, public knowledge on the issue is scant and there is a crucial need to improve public awareness and open up the issue to a wider debate.

Policy and Strategy

Government is aware of the urgent need to take measures to regulate the transfer, handling, use and release of genetically modified organisms in order to minimise the potential risks to biodiversity and human health. To this end, a Bill on genetically modified organisms has been drafted, and there has been government involvement in international negotiations concerning the development of a Biosafety Protocol for the safe handling, use and transfer of genetically modified organisms. Government is of the belief that a proactive and precautionary approach should be taken with regard to the transfer, handling, use and release of genetically modified

organisms. This approach will take into consideration the need to balance the risks associated with genetically modified organisms with the potential social, economic and environmental benefits derived therefrom.

To achieve the objective, Government, in collaboration with interested and affected parties, will:

1. (a) Review, streamline, and if necessary strengthen existing and proposed legislation to establish effective management and control measures to regulate the transfer, handling, use and release of genetically modified organisms in order to minimise the potential risks to biodiversity and human health; and

(b) Continue to participate in international efforts to develop a Biosafety Protocol for the safe handling, use and transfer of genetically modified organisms.
2. Support the adoption of a Code of Conduct for those importing, releasing or undertaking research on genetically modified organisms.
3. Support research that furthers an understanding of the potential ecological, social and economic impacts of genetically modified organisms.
4. Improve public education and awareness concerning the risks and benefits of biotechnology, including genetically modified organisms.
5. Develop and support national training and capacity-building programmes in risk assessment and risk management for the safe transfer, handling, use and release of genetically modified organisms.
6. (a) Negotiate and liaise with neighbouring countries to maximise commonalities and minimise conflicts between policies, legislation and practices relating to genetically modified organisms; and

(b) Promote capacity-building in biosafety within the southern African region, through, *inter alia*, related programmes within the United Nations Environment Programme, and the Regional Biosafety Focal Point in Harare. In this regard special consideration will be given to the risk of unintended movements of genetically modified organisms across national boundaries.

1.8. EX-SITU CONSERVATION

Policy objective 1.8.

Support, complement and enhance *in-situ* conservation through strengthening measures for the *ex-situ* conservation of components of biological diversity.

What is *Ex-Situ* Conservation?

Ex-situ conservation concerns the conservation of genetic resources and of wild and domesticated animals, plants, fungi, and microorganisms off-site, or outside of their natural habitats. In contrast, *in-situ* conservation means the conservation of biodiversity in the wild through the conservation of ecosystems and natural habitats, and the maintenance and recovery of viable populations of species in their natural surroundings.

Many techniques and facilities are used for *ex-situ conservation*, including botanical and zoological gardens, nurseries, arboreta, aquaria, herbaria, genebanks, tissue and culture collections, and captive breeding units.

Ex-Situ Conservation in South Africa

The responsibility for *ex-situ* conservation in South Africa lies with a variety of government, parastatal and private concerns. Most gene and seedbanks are held by the Department of Agriculture, and by institutes of the Agricultural Research Council, whose collections comprise both indigenous and foreign material. A genebank is also maintained by the Department of Water Affairs and Forestry, and a small number of endangered fynbos species are held in collections by the University of Cape Town.

Living plant collections are contained in 30-40 botanical gardens, managed by the National Botanical Institute and an assortment of universities and local authorities. About twenty zoological gardens exist, the majority of which are privately owned. The National Zoological Gardens, in addition to managing several zoological collections which contain both exotic and indigenous species, operates four captive breeding centres. Also located within the country are several aquaria.

Policy and Strategy

In-situ conservation is recognised by Government to be the cornerstone of its strategy to conserve South Africa's biodiversity, but *ex-situ* conservation, and the techniques and facilities used for *ex-situ* conservation, are considered to be essential measures to support, complement and enhance *in-situ* conservation. Some important steps have already been taken in this regard, and well-established *ex-situ* facilities exist in the country, but Government acknowledges the need for additional attention, especially with regard to the management and coordination of genebanks.

To achieve the described objective Government, in collaboration with interested and affected parties, will:

1. Enhance the participation of *ex-situ* institutions in *in-situ* conservation actions identified by Objective 1.1 to be a priority.

2. (a) Promote the *ex-situ* conservation by relevant government departments of indigenous and domesticated livestock breeds, plant genetic resources and microorganisms suitable for agricultural, medicinal, industrial, horticultural, or other commercial purposes;
- (b) Enhance the characterisation and evaluation of such collections to stimulate and encourage their use and, through regeneration and multiplication, to increase their availability to potential users; and
- (c) Ensure that *ex-situ* collections are brought in line with internationally agreed genebank standards.
3. Coordinate the efforts of diverse institutions to enable the development of a comprehensive national strategy to conserve and cost-effectively manage and utilise South Africa's *ex-situ* genetic resource collections.
4. Regulate and manage the collection of biological resources from natural habitats for *ex-situ* conservation purposes so as to avoid or minimise threats to ecosystems and *in-situ* populations of species.
5. Adopt measures by means of *ex-situ* conservation for the recovery and restoration of threatened species, and for their introduction into natural habitats under appropriate conditions (see also Objective 1.5).
6. Strengthen the educational role of *ex-situ* facilities.
7. Coordinate *ex-situ* collaborative programmes within the southern African region to maximise conservation of the region's genetic diversity.

GOAL 2:**USE BIOLOGICAL RESOURCES SUSTAINABLY AND MINIMISE ADVERSE IMPACTS ON BIOLOGICAL DIVERSITY**

This section describes South Africa's plans for meeting three key requirements of the Convention:

- the integration of biodiversity considerations into national decision-making;
- the sustainable use of biological diversity; and
- avoiding or minimising adverse impacts on biodiversity.

The section is divided into four parts:

- sectoral and cross-sectoral approaches;
- using biological resources sustainably and avoiding or minimising adverse impacts on biological diversity in terrestrial, aquatic, and marine and coastal areas;
- integrating biodiversity considerations into land-use planning and environmental assessment procedures; and
- adopting sustainable lifestyles.

Introduction

All South Africans rely on industries or economic activities which directly use biological resources or the services provided by ecosystems. Through such activities, jobs and opportunities are created, and significant contributions are made to the country's economy. However, these benefits are not without direct and indirect costs to the environment: activities which provide socio-economic gains from the use of biological resources and ecosystems often result in the loss of biodiversity, including the impairment of ecosystem functioning. These costs are not considered in conventional accounting measures of national income, consequently indicators such as Gross National Product (GNP) do not reflect the unsustainable depletion of biological resources as a loss to the country's wealth.

To enable South Africans to continue to benefit from the use of biodiversity, and to keep our country fit for life, we need to ensure that decision-making is based upon the real costs and benefits of conserving biodiversity; that biological resources are used sustainably; and that adverse impacts on biodiversity are minimised.

Affected Sectors

South Africa's biodiversity is used by many different sectors in many different ways. At a broad level, these can be divided into economic sectors which:

- ① directly use biological resources, are dependent upon the renewal of such resources, and which by overuse may impact on biodiversity (*e.g.* fishing, hunting, grazing);
- ② those which depend upon ecological processes, but which require the direct transformation of natural systems, and actively impact on biodiversity (*e.g.* cultivation, afforestation); and

- ③ those which do not directly depend upon ecological processes, nor on the consumptive use of biological resources, but which may inadvertently have impacts on biodiversity (e.g. mining, tourism).

Within each of these categories - and reflective of South Africa's dual economy - are modern, highly commercialised industries, as well as more traditional, subsistence activities.

① Sectors that are directly dependent upon the use of local wild species

Highly commercialised sectors that are directly dependent upon the use of local species harvested from the wild, and the renewal of such resources, include the fishing, wood-harvesting, hunting, wildflower, traditional medicine, and other natural product industries.

Reliance upon wild species at the subsistence level includes the gathering, harvesting or hunting of animals and plants for food, medicine, shelter, fuel, building materials, and trade.

Agriculture, as a sector which directly uses ecosystems to provide adequate natural grazing for livestock, can similarly be identified as being directly dependent upon indigenous biological resources, and the adequate renewal thereof.

② Sectors that depend upon ecological processes and require natural habitats to be transformed

Less dependent upon the direct use of indigenous biological resources are activities such as cultivation and afforestation, which depend upon ecological processes - such as the generation of soils, the pollination of crops, or the control of pests - but which require that natural habitats be transformed. The removal of biodiversity is thus a necessary precondition to the successful production of crops or trees.

③ Sectors that do not depend on ecological processes or biological resources, but which have impacts on biodiversity

Many other sectors in South Africa do not rely upon the direct, consumptive use of biodiversity, but may depend upon the maintenance of biodiversity, or may inadvertently have considerable negative impacts on biodiversity. These include industrial sectors dependent upon non-renewable resources, such as mining and energy; those which rely upon chemical or biological processes; those involved in manufacturing or the provision of services such as housing or transport; as well as sectors such as tourism and recreation.

Sectoral Impacts

Each of these sectors impacts upon biodiversity in different ways, and at many different levels of activity. Such activities may result in:

- habitat degradation, loss and fragmentation;
- the overexploitation of species;
- the pollution of soil, air and water;
- the invasion of harmful alien organisms; and

- climatic change (see Table III, page 36).

The importance of each of these primary mechanisms for biodiversity loss varies according to the specific organism being utilised, or to the nature of the ecosystem which is impacted upon.

In the **terrestrial areas** of South Africa for example, habitat loss and fragmentation are the most important factors resulting in biodiversity loss.

In **aquatic areas**, catchment changes, together with alien plant and animal invasions, and domestic, agricultural and industrial pollution, are among some of the primary mechanisms for biodiversity loss.

Estuarine areas, as the interface between rivers and the sea, are profoundly affected by upstream activities, and particularly by factors such as the over-abstraction of water and the alteration of river flows.

And in **marine and coastal areas**, the main threat to biodiversity arises from the overexploitation of marine and coastal resources and from related fishing practices, although pollution and coastal degradation also represent significant threats.

Quite obviously different strategies have to be adopted by the variety of sectors involved, and for the range of ecological systems occurring in the country. In some sectors, livelihoods may be at risk if present activities are not continued, and it may take time to implement required changes. In other sectors, there may be a lack of capacity to effect change, and few economic alternatives. And in others entrenched institutional structures or interests may be in place which are difficult to change.

But sectoral-specific strategies to ensure the sustainable use of biological resources and minimise adverse impacts on biodiversity are only part of the solution. Biodiversity questions are largely cross-sectoral, and the only way in which conservation and sustainable use can be tackled effectively is by a collective endeavour which pulls together the seemingly diverse institutions characterising the various sectors.

Table III. Negative Impacts of Sectoral Activities on Biological Diversity in South Africa

IMPACT ECONOMIC SECTOR	Habitat Loss and Fragmentation	Over- Exploitation of Species	Air, Water and Soil Pollution	Introduction of Harmful Alien Species	Key State Institutions Involved in Promoting or Regulating the Activity
Agriculture	✓ Primarily through cultivation, requiring the removal of natural vegetation, and through bush encroachment.	✓ Overgrazing in parts of the country may result in certain species being overexploited. Through over-harvesting of wildflowers.	✓ Largely through the use of agrochemicals, through siltation, and from mariculture and aquaculture enterprises.	✓ In some instances, through the introduction of high-yielding exotic species for cultivation or pastoral purposes. Through the introduction of alien species for mariculture and aquaculture.	Departments of Agriculture; Land Affairs; Environmental Affairs and Tourism; Related provincial departments; Agricultural Research Council.
Biotechnology Industry	8	8	8	✓ Potential risk through the transfer, handling, use and release of genetically modified organisms.	Departments of Agriculture; Trade and Industry; Environmental Affairs and Tourism; Health; Agricultural Research Council; CSIR.
Chemical Industry	8	8	✓ Activities related to the chemical industry may result in air, water and soil pollution.	8	Departments of Trade and Industry; Environmental Affairs and Tourism; Water Affairs and Forestry; Health.

Defence	<ul style="list-style-type: none"> ✓ Through the use of the land and sea for weapons testing and training. 	<ul style="list-style-type: none"> ✓ Overexploitation of species in areas used for purposes of defence. 	<ul style="list-style-type: none"> ✓ Through the production and use of various weapons. 	8	South African National Defence Force; Department of Environmental Affairs and Tourism; South African Police Services.
Domestic Households	<ul style="list-style-type: none"> ✓ Indirectly, through requiring the range of different economic services described above. 	<ul style="list-style-type: none"> ✓ Through the harvesting of certain plants and animals for food, building, fuel or medicinal purposes. 	<ul style="list-style-type: none"> ✓ Through the generation of sewage and household waste, as well as pollutants associated with cooking and heating. 	<ul style="list-style-type: none"> ✓ Through the use of harmful alien species in gardens. 	Broad range of national, provincial and local government departments.
Power Generation	<ul style="list-style-type: none"> ✓ Through the clearing of land for the construction of infrastructure. Potentially through global warming. 	8	<ul style="list-style-type: none"> ✓ Air, water and soil pollution through the burning of coal and related processes, and the generation of waste from the nuclear industry. 	8	Departments of Minerals and Energy; Water Affairs and Forestry; Trade and Industry; Public Enterprises; Health; Environmental Affairs and Tourism; ESKOM.
Fisheries	<ul style="list-style-type: none"> ✓ Through physical damage to habitat from certain fishing gears. 	<ul style="list-style-type: none"> ✓ Overexploitation of target and non-target species, with ramifications for other species and supporting ecosystems. 	<ul style="list-style-type: none"> ✓ From mariculture and aquaculture enterprises, as well as from fishing gear. 	<ul style="list-style-type: none"> ✓ Through the introduction of alien species for mariculture and aquaculture. 	Directorate Sea Fisheries (Department of Environmental Affairs and Tourism); Provincial Departments of Nature Conservation.

Forestry⁹

✓ Through afforestation which involves the replacement of natural vegetation.

✓ Overexploitation at both commercial and subsistence levels of certain woodland species in parts of the country.

✓ Through, *inter alia*, the pulp and paper industry and the use of agrochemicals.

✓ In some instances, through the introduction of high-yielding exotic species for commercial forestry and recreational purposes.

Departments of Water Affairs and Forestry; Environmental Affairs and Tourism; SAFCOL.

Housing and Infrastructure

✓ Through the clearing of land for development.

✓ May occur through the over-use of indigenous plants for building materials.

✓ May occur from construction activities.

✓ Through the use of harmful alien species in gardens and parks.

Department of Housing; Provincial Departments of Planning; Other relevant provincial and local government departments.

Mining Industry

✓ Through the clearing of land and disturbance of marine and coastal habitats for prospecting and mining activities. The abstraction of water may impact on wetland systems.

8

✓ Activities related to the mining industry may result in water, air and soil pollution. Up to 80% of total solid waste generated in the country arises from the mining industry.

8

Departments of Minerals and Energy; Water Affairs and Forestry; Trade and Industry; Environmental Affairs and Tourism; Health.

⁹ Forestry in South Africa, as defined by the Government's White Paper on Sustainable Forest Development, refers to natural forest resources, commercial forestry, and community forestry and agroforestry.

Tourism and Recreation	✓ Through the construction of tourist-related facilities, particularly along the coast. Through exceeding the tourist carrying capacity in certain areas. Through impacts of off-road vehicles.	✓ Through recreational fishing and the overexploitation of "collectable" species.	✓ Through litter, principally plastic waste.	✓ Through the introduction of exotic fish species for angling.	Department of Environmental Affairs and Tourism; SATOUR; National Parks Board; Provincial departments of environment and tourism and nature conservation agencies.
Trade	8	✓ Overexploitation of species in demand for medicinal or wildlife trade purposes.	✓ Through trade in chemicals and other harmful substances.	✓ Through the unintentional introduction of harmful alien species.	Departments of Trade and Industry; Environmental Affairs and Tourism; Health; South Africa Police Services; Related provincial departments.
Transport	✓ Through road and rail construction and shipping-related activities.	8	✓ Air, water and soil pollution through road, rail, air and sea.	✓ Through the unintentional introduction of alien species through road, rail, air and sea.	Departments of Transport; Environmental Affairs and Tourism; Health; Trade and Industry.
Water	✓ Through dam construction, and water transfer schemes.	8	✓ Through excessive removal of water from watercourses and the consequent concentration of pollutants.	✓ Through inter-basin transfer schemes which unintentionally introduce alien species.	Departments of Water Affairs and Forestry; Health; Environmental Affairs and Tourism.

2.1. SECTORAL AND CROSS-SECTORAL APPROACHES

Policy objective 2.1.

Integrate the conservation and sustainable use of biological diversity into all sectoral and cross-sectoral plans, programmes and policies at all levels of government and industry.

Policy and Strategy

Government recognises that to achieve the goal of using biological resources sustainably and minimising adverse impacts on biodiversity, considerations about biodiversity must be integrated into all spheres of national, provincial and local decision-making, both within and across different sectors. This is a key objective of the biodiversity policy, as well as being an integral part of the development of general national environmental policy.

To achieve this objective, Government, in collaboration with interested and affected parties, will:

1. (a) Ensure that existing South African domestic and foreign policies, plans and programmes support the conservation and sustainable use of biological resources and minimise adverse impacts on biodiversity; and

(b) Ensure the effective incorporation of biodiversity considerations into all new policies, plans and programmes, including the development of a national environmental policy for South Africa, and other ongoing policy initiatives of relevance to biodiversity.
2. (a) Require all government departments responsible for activities affecting biodiversity, or for activities concerning the conservation or use of biodiversity, to develop sector-specific plans based upon agreed guidelines; and

(b) Require sector-specific plans to reflect the integration of biodiversity considerations in relevant sectoral budgets.
3. Establish a national mechanism, representative of key sectors, to oversee, coordinate, and better integrate government policies which directly or indirectly affect biodiversity.
4. Adopt measures to allow for the full environmental, social and economic costs and benefits of conserving and using biodiversity sustainably to be reflected in economic markets, and in national indices of economic status.

2.2. USING BIOLOGICAL RESOURCES SUSTAINABLY AND AVOIDING OR MINIMISING ADVERSE IMPACTS ON BIOLOGICAL DIVERSITY

Policy objective 2.2.

Conserve and use sustainably biological resources in terrestrial, aquatic and marine and coastal areas and avoid or minimise adverse impacts on the biodiversity of such areas.

2.2.1. *Common approaches*

Policy and Strategy

Ensuring the conservation and sustainable use of terrestrial, aquatic, and marine and coastal areas, and minimising adverse impacts on the biodiversity of such areas will require several common approaches to be adopted.

For terrestrial, aquatic, and marine and coastal areas, Government, in collaboration with interested and affected parties, will:

1. (a) Strengthen and streamline existing, or introduce new policies, legislation, incentives, and disincentives to avoid or minimise the adverse effects of human activities on the biodiversity of terrestrial, aquatic, and coastal and marine areas;

(b) Support the incorporation of IEM principles and appropriate environmental management procedures into all planning controls and legislation; and

(c) Require the adoption and effective implementation and enforcement of appropriate regulations concerning the control of activities which may have a detrimental effect on the environment.
2. (a) Identify and wherever possible remove incentives that encourage the loss of biodiversity and the unsustainable, inefficient, and inequitable use of biological resources, taking into consideration social, economic and environmental costs and benefits; and

(b) Maintain, adjust, or develop new financial and other incentives that support the conservation and sustainable use of biodiversity, and stimulate local stewardship of terrestrial, aquatic, and marine and coastal areas.
3. (a) Continue to develop guidelines and determine sustainable harvesting rates and utilisation levels for species and ecosystems used directly for commercial, recreational, or subsistence purposes, or indirectly for purposes such as livestock production;

(b) Ensure that harvesting arrangements are based on the long-term viability of the species concerned and on maintaining ecosystem integrity;

(c) Investigate the use of alternative species or economic activities in cases where the harvesting of species or use of ecosystems is shown to be unsustainable; and

(d) Undertake research and develop and apply methods and technologies aimed at removing or reducing the adverse impacts of harmful activities on terrestrial, aquatic, and marine and coastal biodiversity, and improving the management of such areas.

4. Strengthen management systems for terrestrial, aquatic, and marine and coastal areas by including traditional knowledge, innovations and practices where applicable.
5. Restore and rehabilitate degraded ecosystems where practical and where this will make a significant contribution to the conservation and sustainable use of biodiversity (see also Objective 1.5).
6. Discourage development in areas in which biodiversity and ecological function would be adversely affected (see also Objective 1.1).
7. Negotiate and liaise with neighbouring countries to maximise commonalities and minimise conflicts between policies, legislation and practices relating to cross-border areas such as mountain ranges, water catchments, marine and coastal regions, as well as areas required for animal migration.

2.2.2. *Terrestrial areas*

Terrestrial Biodiversity in South Africa

The transformation of South Africa's terrestrial areas is perhaps the most visibly dramatic evidence of the loss of biodiversity in the country. Comprehensive estimates are not available concerning the extent to which terrestrial areas have been modified, although a conservative assessment is that at least 25% of the land has been transformed for purposes of cultivation or afforestation, for urban or industrial development, or to enable roads, railways and dams to be built. Areas which are not developed may be subject to overgrazing, to infestation by alien plants and animals, or to the overexploitation of certain species for subsistence or trade purposes.

There are seven major terrestrial biomes, or habitat types, in South Africa: forest, fynbos, grassland, Nama karoo, succulent karoo, savanna, and thicket (see Tables IV and V). These biomes can in turn be divided into 68 vegetation types, which are communities which share common species, have similar vegetation structures, and share the same set of ecological processes. The degree to which each of these biomes is threatened varies, depending upon the fertility of the soil, the economic value derived from use of the area, human population pressures, and the extent to which the biome is conserved in protected areas. The grassland biome, for example, is the mainstay of dairy, beef, and wool production in South Africa and of crops such as maize. It is also poorly represented in protected areas. Similarly much of the Renosterveld, which is part of the fynbos biome, has been ploughed for agriculture, and is also not represented adequately in protected areas. Urgent conservation action is also needed for the Nama karoo, succulent karoo, and thicket biomes.

Policy and Strategy

The loss of biodiversity in terrestrial areas of South Africa is considered by Government to be a matter of grave concern, requiring urgent action by diverse sectors at many different levels. Government recognises the important role played by involved sectors in the economic development of the country, but believes that opportunities exist, through conserving and using biological resources sustainably, to optimise both conservation and development benefits, and to minimise the adverse impacts of various activities on terrestrial biodiversity.

To achieve this objective, Government, in collaboration with interested and affected parties, will:

1. Investigate, formulate and implement integrated land-use planning approaches that include multiple natural resource activities which are compatible with and which complement the conservation and sustainable use of biodiversity.
2. Promote the conservation of biodiversity in urban areas by encouraging retention of habitat and wherever possible focusing future development on existing built-up areas.
3. Encourage the planting of indigenous crops and trees to build the local resource base and to improve living environments.
4. (a) Review the impact of agricultural and commercial forestry practices on biodiversity and seek changes where necessary;
- (b) Ensure that biodiversity considerations are incorporated into the review of the afforestation permit system;
- (c) Strongly encourage agricultural producers to incorporate biodiversity considerations in farm management practices and plans;
- (d) Promote the optimal use of on-farm inputs, and the minimal use of external inputs such as chemical fertilisers and pesticides;
- (e) Foster the development and use of safe agricultural pest control products and the use of integrated pest management approaches to minimise adverse impacts on ecosystems and on non-target species;
- (f) Promote sustainable rangeland management practices to maintain maximum species diversity, and discourage agricultural production on poor or marginal land;
- (g) Promote irrigation practices which use water efficiently and which minimise waterlogging, salinisation, and other adverse effects on biodiversity;
- (h) Support the *ex-situ* and on farm conservation and sustainable use of indigenous and domesticated livestock breeds and crop varieties;
- (i) Support coordinated research and development into achieving the ecologically sustainable use of biological resources in agriculture and forestry, and minimising adverse impacts on biodiversity; and

(j) Strengthen delivery of extension and research services related to the management of agricultural, forestry, and pastoral systems to ensure the sustainable use of biological resources and the conservation of biodiversity.

Figure 5. The Species Richness of South Africa's Terrestrial Areas¹⁰

Province	Biomes	Number of species				
		Plant	Mammal	Bird	Amphibian	Reptile
Eastern Cape	7	6164	156	384	51	57
Free State	3	2984	93	334	29	47
Gauteng	2	3303	125	326	25	53
KwaZulu-Natal	4	6141	177	462	68	86
Mpumalanga	3	4782	160	464	48	82
North-West	2	3025	138	384	27	59
Northern Cape	6	5067	139	302	29	53
Northern Province	3	4236	239	479	44	89
Western Cape	6	8925	153	305	39	52

¹⁰ Data from DEAT, Pretoria, as illustrated in *Vegetation of South Africa, Lesotho and Swaziland*, edited by A.B. Low and A.G. Rebelo. Published by the Department of Environmental Affairs and Tourism, January 1996.

2.2.3. *Aquatic areas and wetlands*

What are Wetlands?

Many of the adverse impacts of human activities on biodiversity manifest themselves most strongly in the wetlands of South Africa. In terms of the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) these include "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salty, including areas of marine water the depth of which does not exceed six metres". Therefore wetlands include riverine, lake, marsh, estuarine, and marine systems. Wetlands play a crucial role in terms of providing clean water, maintaining biodiversity, protecting areas against floods, recharging aquifers, buffering against toxins, and providing areas for recreation, education and research.

Freshwater Systems in South Africa

Adverse impacts on freshwater systems are of critical concern given both the scarcity of and increased demand for water in the region. The flow of almost every river system has been regulated by storage dams, or by structures associated with the inter-basin transfer of water. Salinisation, eutrophication, and pollution by heavy metals, mine dump effluents, pesticides, insecticides and herbicides have considerably reduced both surface- and ground-water quality. Catchment changes through afforestation, alien plant invasion, irrigation and over-abstraction, and human settlement have reduced natural run-off and groundwater levels substantially, and invasive plants and animals jeopardise indigenous wildlife on a national scale. Moreover, wetlands such as marshes, bogs and floodplains have undergone considerable alteration and degradation: through drainage for crop and timber cultivation; infilling for urban and industrial development and waste disposal; mining for the extraction of sand, clay and peat; as well as through a range of other activities.

Although there is a lack of information concerning wetland losses in South Africa, that evidence which does exist suggests clearly that the loss of wetlands has been high, with loss appearing to be greatest in the coastal and inland margin zones of the country. In the Mfolozi catchment, for example, some 58% of the original wetland area is estimated to have been lost.

South African Estuaries

Estuarine areas, as the interface between rivers and the sea, include some of the most productive and threatened ecosystems in South Africa. Sustaining a rich abundance of fish, bird, and invertebrate species, and habitats such as mangroves, seagrass beds, and saltmarshes, estuaries provide important nursery grounds for marine fish, sustain several fisheries, control flood events, provide a rich feeding ground for birds, and are a necessary component for the life-cycle of many invertebrate species.

The ecological functioning of estuarine ecosystems is critically dependent upon the complex and dynamic interplay between rivers and the sea, a factor which increases the vulnerability of such environments to changes both within catchments and in the sea. Activities having far-reaching effects on estuarine ecosystems include excessive water abstraction, resulting in a reduction of freshwater to estuaries; agricultural practices that lead to increased soil erosion and thus silt deposition in estuaries; urban or industrial development adjacent to estuaries; modifications to river and tidal flows through floodplain development and the construction of bridges, harbours, and dams; and pollution resulting from the diversity of activities occurring in catchments.

Policy and Strategy

The degradation of South African wetlands, and their vulnerability to human-induced changes in catchments and in the sea, is a concern recognised by Government as requiring urgent action and cooperation between a diversity of sectors and institutions. Wetlands represent some of our most threatened ecosystems, and as such their conservation and sustainable use is a crucial component of this policy. Government acknowledges that insufficient attention has been given in the past to secure the effective management of the country's wetlands, and it undertakes to ensure that the future management of such areas will take place in an integrated manner, in accordance with the objective of conserving and using biological resources sustainably, and minimising adverse impacts on aquatic biodiversity. This approach will recognise and accommodate conflicting needs and values.

Several measures already govern the conservation and use of South Africa's wetlands, and many new initiatives are under way, as a result of the revision of the country's water law. Wherever possible and appropriate, Government will bolster such initiatives and, in collaboration with interested and affected parties, will:

1. Support the principle that basic domestic needs and environmental needs will enjoy priority use of water, the latter through reserving the quantity, quality and reliability of water required to maintain natural flow regimes and habitat complexity for aquatic and riparian ecosystems.
2. Facilitate the development of appropriate legislation to secure the conservation of South Africa's wetlands, and to maintain their ecological and socio-economic function.
3. Promote the establishment of a National System of Protected Wetlands as part of the protected area system (see Objective 1.3).
4. Prevent inappropriate activities and development around wetlands, and that of linear development in particular. Ensure that adequate buffer strips are retained around wetlands, taking due cognisance of the 1:50 year floodline.
5. Introduce policy measures to ensure that the price of water reflects the full social, economic and environmental costs and benefits of water provision, taking into consideration the need to maintain life-line tariffs to ensure a basic level of health and quality of life.
6. Through establishing appropriate mechanisms and procedures, recognise the functions and values of wetlands in resource planning, management and decision-making.
7. Ensure that considerations relating to the biodiversity of aquatic areas and wetlands are adequately incorporated into the national policy on integrated pollution control and waste management.
8. Determine the impact of commercial, recreational and subsistence fishery practices on fisheries, fish, and their habitats, and develop guidelines for managing such fisheries on an ecologically sustainable basis.
9. Determine the impact of aquaculture species and management practices on biodiversity, and develop appropriate guidelines for aquaculture developments.

10. Strongly promote the development of catchment-specific partnerships and joint management plans between the range of institutions, organisations and individuals engaged in managing and using wetlands, catchments and associated marine and coastal areas.
11. Provide leadership in international wetland conservation efforts, through the effective and coordinated management of transboundary water and biological resources in southern Africa.

2.2.4. *Marine and coastal areas*

Marine and Coastal Areas in South Africa

Marine and coastal areas contain a significant amount of South Africa's biological diversity, and in addition to providing essential ecosystem services such as climate regulation, are of importance to the South African economy with regard to the fishing industry, mineral, oil and gas exploitation, tourism, recreation, trade and transport opportunities.

Biodiversity conservation has historically focussed on the terrestrial environment, and while there are common principles for the conservation of terrestrial and marine biodiversity, there are also several characteristics of the marine and coastal environment that present decision-makers and resource managers with a unique set of problems. For example, within the Exclusive Economic Zone, marine resources fall under national ownership, but not in oceanic waters outside of this area; the fact that species straddle or migrate across political boundaries; the "invisibility" of marine, coastal and other aquatic environments, which makes research and monitoring particularly difficult; and the environmental continuity of the oceans, meaning that local impacts may have global effects. Adding complexity to this situation is the fact that aquatic organisms - primarily fish - are the only major human food resource harvested directly from wild populations.

Despite these differences, the threats to marine and particularly to coastal biodiversity are similar in many respects to those facing biodiversity on land, with most threats originating from land-based activities. In South Africa such threats include marine pollution, from domestic sewage, industrial waste, stormwater drains, and oil spills; coastal zone degradation, from rapid urbanisation, tourism, recreation, infrastructural development, and mining on parts of the coast and in the ocean; the overexploitation of marine resources, primarily by industrial fisheries, but also by recreational fishers, and in some intertidal areas, by subsistence communities; and the introduction of alien species, either inadvertently through ballast water or on ship hulls, or intentionally through activities such as mariculture.

Policy and Strategy

South Africa's marine and coastal areas are considered by Government to be an asset of unsurpassed value, requiring careful and effective management to secure lasting benefits for the nation. Several processes are currently underway which support this commitment, including the development of national policies on coastal zone management, and on marine fisheries. Government believes that if marine biodiversity is to be conserved effectively and used sustainably, it is necessary to adopt a cross-sectoral approach which embraces the need for wide-ranging, comprehensive, transboundary responses to threats; which treats the entire hydrological cycle as an integrated unit; and which governs actions on land as well as in the sea. This approach will be the departure point from which a more detailed strategy is pursued.

In this context, and to achieve the objective, Government, in collaboration with interested and affected parties, will:

1. (a) Ensure that considerations relating to the conservation and sustainable use of marine and coastal biodiversity are effectively incorporated into national policies on integrated pollution control and marine fisheries; and
(b) Support the rapid development of a national policy on coastal zone management, and the incorporation of biodiversity considerations therein.
2. Require that those using marine resources, receiving services from marine and coastal ecosystems, or producing waste must bear all environmental, social, and economic costs, and the responsibility for any consequential detriment to the environment and to associated biota.
3. Prevent inappropriate activities and development along the coast, and that of linear or ribbon development in particular. Ensure that adequate buffer strips are retained to protect the coastal zone.
4. Amend existing legislation or introduce new legislation to control the exploitation of all marine organisms that are not presently legally protected.
5. Investigate the impacts of commercial fishery practices on ecosystems, on target, non-target and by-catch species, on the viability of populations, and on genetic diversity.
6. Determine the impact of recreational fishers on fisheries, fish and their habitats, and develop a national strategy and guidelines for managing recreational fishing on an ecologically sustainable basis.
7. Undertake research concerning the management and control of subsistence artisanal fisheries, including the development of appropriate monitoring systems.
8. Determine the impact of mariculture species and management practices on biodiversity, and develop appropriate guidelines for mariculture developments.
9. Develop and promote fishing techniques and procedures that are species and size specific, and that have the least impact on ecosystems and on non-target species.

2.3. LAND-USE PLANNING AND ENVIRONMENTAL ASSESSMENT

Policy objective 2.3.

Integrate biodiversity considerations into land-use planning procedures and environmental assessments.

Land-Use Planning and Environmental Assessment in South Africa

Biodiversity is often adversely affected by planning and development decisions and actions. This may be through a failure to incorporate biodiversity considerations into physical planning documents, such as regional plans and structure plans; through inadequate information and misguided decisions; or because of inappropriate policies. South Africa's history of environmental planning is particularly poor.

These concerns are well recognised in South Africa, and have resulted in the development of a procedure known as Integrated Environmental Management (IEM), a process designed to incorporate the environmental considerations of development proposals within the planning process. Environmental impact assessment (EIA) is a step within the IEM procedure, and by international standards, the EIA strategy employed in South Africa is relatively sophisticated. It is holistic and embraces both bio-physical and social considerations; requires public participation; provides for the inclusion of environmental concerns early in the planning process; calls for alternative proposals to be considered; and continues through to monitoring, auditing and decommissioning. To this end, IEM is a useful tool for minimising the adverse impacts of development on biodiversity.

Despite the sophistication of EIA and IEM procedures in South Africa, there are few legal requirements for their use. Although EIAs are commonly undertaken for large-scale developments, this is on a voluntary rather than a legal basis. One exception, however, is the mining industry, which in terms of the Minerals Act 50 of 1991, is required to operate with approved environmental management programmes.

Many argue that IEM procedures are too complex and costly, and overlap with existing planning procedures and permit requirements. Skeptics of the present system also point out that EIAs are severely compromised by being funded and having their terms of reference set by the project proponent. Ideally, EIAs would be mandatory, and as independent as possible. Of concern for biodiversity conservation is the fact that EIAs are often project-based, fail to consider cumulative environmental impacts within the bioregion, and take a piecemeal approach when considering impacts on biodiversity. To overcome these concerns many argue that EIAs should be undertaken not only for projects, but for programmes and policies, and should improve integration between the varied biological assessments often undertaken for a single project.

Policy and Strategy

Government is well aware of the need to review land-use planning and environmental assessment procedures in South Africa. The Department of Environmental Affairs and Tourism has recently published draft regulations concerning the control of activities which may have a detrimental effect on the environment, as well as guidelines for producing comprehensive environmental impact reports. The effectiveness of existing planning controls and the IEM process is also being investigated by the national process to determine a general environmental policy for South Africa.

These initiatives will continue to be supported by Government which, in collaboration with relevant interested and affected parties will:

1. Strongly support the adoption of a bioregional approach to planning for terrestrial, aquatic, and marine and coastal areas, whereby natural boundaries (*e.g.* catchment areas) are used to facilitate the integration of conservation and development needs, and conservation is proactively incorporated into land-use plans.
2. Support the incorporation of IEM principles and appropriate environmental procedures into all planning controls and legislation.
3. Ensure that potential impacts of projects, programmes, plans and policies on biodiversity are assessed and reflected in planning processes (*e.g.* town planning and zoning schemes) and environmental assessments, and that decision-making seeks to avoid impacts, to minimise risks, and to mitigate adverse impacts wherever possible.
4. Investigate, formulate and implement integrated land-use planning approaches that include multiple natural resource activities which are compatible with and which complement the conservation and sustainable use of biodiversity.
5. Integrate consideration of the cumulative and secondary impacts on biological diversity of development proposals, and the reversibility of proposed actions over time, into regional planning processes and environmental impact assessment procedures.
6. Ensure that potential impacts of projects, programmes, plans and policies on biodiversity are assessed in an integrated manner and by competent professionals.

2.4. ADOPTING SUSTAINABLE LIFESTYLES

Policy objective 2.4.

Support efforts to stabilise human population and reduce resource consumption to achieve socially and ecologically sustainable development.

Addressing Population and Consumption Issues in South Africa

The preceding steps to achieve the conservation and sustainable use of biodiversity, and to minimise the adverse impacts of activities are necessary, but not sufficient, to address the loss of biodiversity in South Africa. Underpinning the crisis is a complex array of inter-related social, economic, political and demographic factors. These include institutional failures to regulate the use of biological resources; economic systems that fail to recognise the true value of biodiversity; inequity in the ownership, management and flow of benefits from the conservation and use of biological resources; high levels of poverty; and a lack of knowledge about the way in which natural systems function.

Ultimately, however, human impacts on biodiversity depend upon two key factors: the number of people using natural resources; and the rates at which they consume those resources. Increasing human populations and unsustainable rates of resource consumption both lead to a growth in demand for natural resources, and therefore an increase in the impact on biodiversity. Because the natural resource base is limited, it is important to consider ways in which a balance can be struck between the use of resources, and the capacity of ecological systems to renew resources and to absorb wastes.

Population is an important issue in South Africa, but needs to be considered together with questions about resource use, particularly patterns of production and consumption. Global figures indicate that 77% of the world's people earn 15% of total income; that 24% of the world's population consume 75% of energy, mineral and metal resources, and more than half the world's food; and that over 90% of waste in the world is generated by the affluent. Similar figures are not available for South Africa but what is clear is that people's use of resources is very uneven, and that consumption is highest amongst the industrial sector and the more affluent. Strategies thus need to address not only the stabilisation of population growth, but also the wasteful overconsumption of natural resources.

Policy and Strategy

In collaboration with interested and affected parties, Government will:

1. Ensure that considerations relating to the conservation and sustainable use of biodiversity are adequately incorporated into the national policy on population.
2. (a) Develop comprehensive strategies to address population, production and consumption patterns and their impact upon environmental sustainability; and
(b) Initiate research and establish a dialogue to assess national population and consumption trends, with respect to satisfying basic needs and determining South Africa's capacity to support human settlement.
3. Support initiatives to reduce resource consumption by promoting the elimination or reduction of waste at source, and its re-use, recycling, and recovery.
4. Through a review of the education system, and the use of such mechanisms as the media:
 - (a) increase awareness about the links between human population growth, resource consumption, and biodiversity;
 - (b) increase awareness about the lifestyle choices that affect biodiversity, and promote sustainable living based on the opportunities derived from the sustainable use of biological resources.

GOAL 3:**ENSURE THAT BENEFITS DERIVED FROM THE USE AND DEVELOPMENT OF SOUTH AFRICA'S GENETIC RESOURCES SERVE NATIONAL INTERESTS****What are Genetic Resources?**

Genetic resources include the diversity of plants, animals, or other organisms of actual or potential value. South Africa both depends upon genetic material from elsewhere and contains an extraordinary diversity of indigenous genetic material which has the potential to be used in a range of commercial and environmental applications. As is the case for other countries in the world, South Africa is heavily dependent upon material from elsewhere for its agriculture, horticulture, and forestry industries, as well as for the biological control of pest species and thus requires continued access to the broader gene pool of genetic resources located elsewhere in the world. This requires continued coordination and cooperation with other countries.

There are many different types of genetic resources that may be used for different purposes. For example, categories of plant genetic resources for food and agriculture may include wild species, wild relatives of crop species, landraces, primitive and obsolete varieties, modern varieties, breeding lines and experimental populations, and lines with specific genetic characteristics. Many other types of genetic resources are used for such purposes as pharmaceutical development, traditional medicine, horticulture, personal care and cosmetics, foods or beverages, or environmental remediation.

From Common Heritage to National Sovereignty

Genetic resources have long been traded across the world and used strategically for political and economic gain. Historically, such resources were regarded as the common heritage of humankind, freely accessible to anyone. But two-third's of the world's biological resources are located in developing countries, and most of the benefits derived from commercialisation of these resources have accrued to industrialised countries that possess the necessary financial and technical capacity to develop them. These asymmetries have led to the "common heritage" concept being fundamentally challenged.

Questions that are central to this highly controversial debate are concerned with the ownership of biodiversity; the equitable distribution of benefits derived from the use of biodiversity; and the fair compensation for local and traditional knowledge about biodiversity. How, it is asked, can genetic resources be "free" if pharmaceutical and seed companies are assigning ownership to such resources through intellectual property rights such as patents and plant breeder's rights? Why are the intellectual contributions of traditional healers or farmers not accorded the same significance? How can biologically rich countries from where genetic resources are sourced be compensated for conserving these biotic riches? And why should national sovereignty be recognised for natural resources such as oil and timber, but not for genetic and biochemical resources?

It was within this context that negotiations leading to the Convention on Biological Diversity were framed. The Convention is significant in being the first international agreement to establish the sovereign rights of nations over their genetic resources. Indeed, one of its main objectives is to ensure the fair and equitable sharing of benefits arising from the use of genetic resources. No longer are genetic resources the common heritage of humankind.

Agricultural Biodiversity

This shift towards national sovereignty has important implications for agriculture and forestry given the reliance of countries on introduced crops, and the fact that no country in the world is completely self-sufficient in genetic resources. Although many nations contain significant genetic diversity in genebanks and on farmers' fields, they will still continue to require access to the diversity available elsewhere. This situation is especially pertinent to South Africa, where the agriculture, livestock and forestry industry are predominantly based upon introduced species. Such industries are dependent upon continued access to genetic resources from elsewhere in the world. Also of relevance is the fact that South Africa is a signatory to the International Convention for the Protection of New Varieties of Plants (UPOV), as amended in 1991.

The continued availability of genetic resources for food and agriculture is clearly essential for global food security. The conservation of such resources is also of paramount concern given the alarming rate of loss of plant genetic diversity, and the need for new varieties to meet the food needs of a growing population and the demands of changing agro-ecological and social conditions.

Many national and international institutions and agreements have been established to address these issues. Perhaps most significant was the establishment in 1983 of the intergovernmental Commission on Plant Genetic Resources (now the Commission on Genetic Resources for Food and Agriculture), and adoption of the International Undertaking on Plant Genetic Resources by member countries of the Food and Agriculture Organisation (FAO) of the United Nations. Underpinning the Undertaking is the principle that "plant genetic resources are a heritage of mankind and consequently should be available without restriction", although this principle has been subsequently subjected to "the sovereignty of States over their plant genetic resources".

The thirteen years since the Undertaking's adoption have seen considerable changes in approaches to genetic resources and to issues concerning biodiversity. In addition to the entry into force of the Convention on Biological Diversity, advances in biotechnology and pressures to enact stricter intellectual property legislation have heightened the need to develop a new international regime relating to the management of plant genetic resources for food and agriculture. Presently, the Undertaking is being revised by the Commission in harmony with the Convention on Biological Diversity. Many have commented on the need for a legally binding multilateral agreement, possibly in the form of a protocol under the Convention. Of relevance is the recent adoption by governments of the Leipzig Declaration and a Global Plan of Action for the Conservation and Sustainable Utilisation of Plant Genetic Resources for Food and Agriculture, negotiated under the auspices of the Food and Agriculture Organisation of the United Nations.

While continued access to resources for food and agriculture is clearly important, the Convention recognises that countries will benefit from their indigenous resources only by some form of controlled access. Thus Article 15 supports the understanding that countries will not "shut the greenhouse door", but will rather "create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties and not impose restrictions that run counter to the objectives of this Convention".

The Debate about Farmers' Rights

One of the key elements presently being discussed in the revision of the International Undertaking on Plant Genetic Resources concerns that of Farmers' Rights. A 1989 Annex to the Undertaking defines Farmers' Rights as "rights arising from the past, present and future contributions of farmers in conserving, improving and making available plant genetic resources, particularly those in the centres of origin/diversity. These rights are vested in the International Community, as trustee for present and future generations of farmers, for the purpose of ensuring full benefits to farmers, and supporting the continuation of their contributions, as well as the attainment of the overall purposes of the International Undertaking". The Undertaking envisages that such rights be realised multilaterally through an international fund, the proceeds of which could be used to support plant genetic resource conservation and utilisation programmes.

Farmers' Rights are, however, understood in many different ways by governments. Some governments treat Farmers' Rights as a moral principle but with little practical meaning. Others see such rights as a legal tool to share benefits between countries. And others see it as a critical way in which small-scale farmers and farming communities can be empowered to further improve their farming systems and conserve genetic resources. Central to the debate is the development of *sui generis* systems for the protection and compensation of informal innovations in the area of plant genetic resources, and the protection of the so-called "farmers' privilege" under the International Convention for the Protection of New Varieties of Plants (UPOV). It is argued that the adoption of such measures could ensure that farmers and farming communities share equitably in the benefits derived from the utilisation of their traditional knowledge, innovations and practices.

In South Africa, there has been little discussion on issues related to Farmers' Rights, and policies to protect such rights are poorly developed. In addition, scant information exists on the use of indigenous and traditional varieties or landraces. Such plants are still utilised by subsistence farmers and are highly valued as a food source in rural areas, but there are no formal *in-situ* conservation programmes in place. One of the most immediate needs is to initiate a consultative process with small-scale farmers and other farming communities on the nature and application of Farmers' Rights in the country. This is especially pressing in light of the ongoing negotiations to revise the International Undertaking on Plant Genetic Resources, and the importance of ensuring that such interests are reflected in international negotiations.

What is Biodiversity Prospecting?

With genetic resources no longer the "common heritage" of humankind, increasing attention has been paid to their commercialisation. Biodiversity prospecting refers to the search for commercially valuable genetic and biochemical resources from nature. These could be novel chemicals or genes used to develop new drugs, improve crop yields, or accord pest resistance to plants. Many indigenous species also hold promise for exploitation and commercialisation through domestication (e.g. ornamentals and forages). Resources for biodiversity prospecting may originate from plants, marine organisms, insects and other vertebrates, invertebrates, fungi or bacteria.

Considerable controversy surrounds biodiversity prospecting. Some regard it as a panacea for biologically rich, but financially poor countries, and as an incentive for biodiversity conservation. Others consider it with a good deal of suspicion, and see the Convention's provisions to regulate access as an attempt to legitimise continued multinational corporation control of developing country's biological resources. What is becoming increasingly evident is that biodiversity prospecting is not a "pot of gold" for countries providing genetic resources. Although the combined world market exceeds 300 billion dollars annually, commercial ventures are risky and costly, and the likelihood of discovering a valuable compound is low. However, with a well considered strategy, biodiversity prospecting can reap benefits for countries rich in genetic diversity, especially with regard to enhancing research capacity and developing technology.

Biodiversity Prospecting in South Africa

South Africa is a favoured destination for "biodiversity prospecting" companies seeking potential new crops and novel biochemical molecules with medicinal, agricultural, horticultural, environmental, or other economic potential. This is largely because of the country's high levels of endemism and diversity, comprehensive knowledge base of the fauna and flora, considerable scientific capacity, well-developed infrastructure, and well-managed protected areas and living collections, which enables the reliable sourcing of materials. Presently, a multitude of organisations and individuals are involved in the research and development of our genetic resources, and research institutions are looking towards biodiversity prospecting as an important avenue for revenue generation and technology transfer. A range of provincial departments are involved in issuing permits for collecting activities, as are central government agencies. Considerable activity exists outside of this formal network, with daily removals of genetic material out of the country. Of concern is the fact that present activities concerning the export and use of South Africa's biodiversity are virtually uncontrolled, and that commercial exploitation of the country's genetic resources is taking place in a policy and legal vacuum.

3.1. ACCESS TO INDIGENOUS GENETIC RESOURCES

Policy objective 3.1.

Control access to South Africa's indigenous genetic resources through the introduction of appropriate legislation and establishment of institutional structures.

Policy and Strategy

The Convention on Biological Diversity recognises the sovereign rights of countries over their genetic resources, and their authority to determine access conditions, including the sharing of benefits gained. In terms of the Convention, South Africa is required to facilitate access to genetic resources by other Contracting Parties, and to ensure that any genetic resources acquired are on mutually agreed terms.

Government recognises that South Africa's genetic resources provide valuable opportunities for the nation to enhance the benefits from its vast biological wealth. The present situation, whereby foreign organisations and individuals have enjoyed almost free access to our genetic resources with little gain to either the country or the people from whom knowledge is gleaned, is a matter of considerable concern.

It is clearly in South Africa's interest to control access to its genetic resources, and to thereby ensure that benefits arising from the use and development of such resources serve the national good. It is, however, also in South Africa's interest to ensure that access is not unnecessarily restrictive, and that conditions are provided which stimulate economic activity and allow for South Africa's continued access to foreign sources of genetic material. Thus Government will pursue an approach whereby access to South Africa's genetic resources is both controlled and facilitated, in line with certain principles.

To achieve this objective, Government, in collaboration with interested and affected parties, will:

1. (a) As a matter of urgency, and through appropriate structures:
 - develop detailed guidelines and conditions for biodiversity prospecting;
 - examine the applicability of such guidelines and conditions for domestic and foreign companies;
 - guide the development of appropriate agreements;
 - investigate the strengthening of existing controls and legislation, including the establishment of national sovereignty over South Africa's biological resources; and
 - investigate the establishment of a national clearing house to regulate and administer all exchanges of genetic resources, and to coordinate future activities.

- (b) Develop and implement an efficient permitting system whereby authorisation is required for the collection of any biological or genetic resource to be used for research, trade or commercial purposes. This system will include the provision of comprehensive information from users and collectors, including the environmental impact of proposed activities and benefit-sharing arrangements. Where appropriate, the consent of local communities and

private landowners will be required prior to the collection of material. Consent will also be required from holders of traditional knowledge prior to the collection of such information.

2. Require that benefit-sharing arrangements take into consideration:
 - (a) the need to strengthen the conservation of biodiversity in South Africa;
 - (b) the need to promote the reconstruction and development of South Africa, and to stimulate economic development in the most disadvantaged parts of the country and sections of the population;
 - (c) the rights of local communities, farmers, and others holding traditional knowledge to benefit from co-ownership of research data, patents, and products derived from their knowledge;
 - (d) the need to adopt a multi-faceted approach to benefit sharing, whereby a range of short- and long-term financial and non-monetary benefits are gleaned; and
 - (e) the need to strengthen South Africa's science and technology capacity.
3. Establish a system to allow for funds generated from biodiversity prospecting to be received and disbursed equitably, in line with the benefit-sharing arrangements articulated in (2) above.
4. Ensure that the collection of biological and genetic resources for research and development purposes does not adversely affect the conservation status of the genes, species, population, community, habitat, ecosystem, or landscape.
5. Promote coordination and cooperation between national research institutions engaged in biodiversity prospecting to enable the South African research community to strategically position the country in this field.
6. Encourage the development of institutional policies and professional codes of conduct to guide collection, research and commercial activities.
7. Investigate, through appropriate structures, the development of a system to provide legal protection for collective intellectual property rights.

3.2. ACCESS TO GENETIC RESOURCES FOR FOOD, AGRICULTURE, AND FORESTRY

Policy objective 3.2.

Ensure continued access to sources of genetic material for food, agriculture, and forestry.

Policy and Strategy

Government is committed to adopting a uniform set of principles to guide the way in which access to genetic resources is controlled, and recognises the importance of maintaining a consistent approach with regard to the implementation of policy for indigenous genetic resources that are used for different purposes. With regard to plant genetic resources, there are presently relatively few wild relatives of commercially produced crop plants that are indigenous to South Africa, but many indigenous species are considered to hold potential for new crops and forages. Indigenous animal and microbial genetic resources may also hold considerable potential for diverse uses.

While embracing a consistent approach to control access to indigenous genetic resources, Government recognises the mutual interdependence of nations on the global genepool of biodiversity, and the need for equitable benefit-sharing - both at the international and national levels. In particular, the development of specific strategies to ensure continued access to genetic resources for food, agriculture, and forestry is considered to be of paramount importance. To this end, Government is actively participating in negotiations to harmonise the International Undertaking on Plant Genetic Resources with the Convention on Biological Diversity, and has also established a Committee on Plant Genetic Resources to consider such matters.

Within this context, Government, in collaboration with interested and affected parties, will:

1. (a) Continue to participate in international negotiations to harmonise the International Undertaking on Plant Genetic Resources and other relevant international agreements with the Convention on Biological Diversity; and
- (b) Through appropriate structures and mechanisms, ensure consultation with interested and affected parties in the formulation of national positions on the revision of the International Undertaking on Plant Genetic Resources.
2. (a) Initiate a process of national and local consultation, whereby the South African farming community, and small-scale farmers in particular, fully participate in the shaping, definition, and implementation of measures and legislation on Farmers' Rights;
- (b) Investigate, through appropriate structures, the development of a system to provide legal protection for a collective rights regime that protects and controls farmers' knowledge, innovations, materials, and practices relevant to the conservation and sustainable use of genetic resources; and

- (c) Review, assess and where appropriate modify relevant national policies and legislation to ensure that they support and do not run counter to Farmers' Rights and to relevant international agreements.
3. Adopt research, training, and institutional capacity-building activities to empower small-scale farmers and other farming communities in the acquisition, conservation, development and use of landraces, and of indigenous and traditional livestock breeds and plant varieties.

GOAL 4:**EXPAND THE HUMAN CAPACITY TO CONSERVE BIODIVERSITY, TO
MANAGE ITS USE, AND TO ADDRESS FACTORS THREATENING IT**

This section describes South Africa's plans to meet requirements of the Convention concerning the expansion of human capacity to conserve biodiversity, to manage its use, and to address threats to it. South Africa's approach towards achieving this goal has three main components:

1. Increasing public appreciation and awareness of the value and importance of biodiversity, and public involvement in its conservation and sustainable use;
2. Improving the understanding of biodiversity through conducting research, improving biological inventories, establishing and maintaining monitoring systems, sharing information, and incorporating traditional knowledge, and;
3. Strengthening existing management capacity through appropriate training.

4.1. PUBLIC EDUCATION AND AWARENESS**Policy objective 4.1.**

Increase public appreciation, education and awareness of the value and importance of biodiversity, and public involvement in its conservation and sustainable use

Policy and Strategy

Without the support and commitment of all South Africans, efforts to conserve this country's biodiversity are unlikely to succeed. Government considers this to be one of the most critical issues to address in the implementation of this policy. Past efforts to improve public awareness and appreciation of the importance of biodiversity have frequently been culturally biased, focusing largely on the value systems of the affluent. Thus a narrow interpretation of biodiversity has predominated, directed at the need to preserve endangered species and maintain protected areas rather than at the broader development context which makes biodiversity relevant to the millions of people in South Africa who are dependent upon the country's biological resources to fulfil their basic needs. This has been aggravated by the inaccessibility of protected areas to the poor, leading to the perception that conservation is elitist and irrelevant to the majority of South Africans.

Government will redress these perceptions so that the conservation and sustainable use of biodiversity becomes an issue of concern and meaning to South Africans of all ages and in all walks of life: from decision-makers in Parliament through to communities in rural areas and youth in the townships. There are already many initiatives underway which support this conviction, both within the formal education sector and informally in the work-place and community.

Government will bolster such efforts and, in collaboration with relevant interested and affected parties, will:

1. Develop and implement targeted public awareness programmes for groups of people such as decision-makers and politicians; business executives; consumers; non-governmental organisations; children; and those in rural and urban areas who are reliant upon the use of biological resources. Such programmes will take into account people's understanding of biodiversity and their local environments, foster an appreciation of local knowledge of biodiversity, establish clear links between biodiversity conservation and community health and welfare, and will describe conservation actions that can be taken by specific groups.
2. Encourage organisations engaged in researching, managing or conserving biodiversity to popularise their work, to disseminate information about biodiversity, and develop or strengthen biodiversity education and interpretative programmes in such places as protected areas, natural history museums, zoos, aquaria, botanical gardens, public open spaces, and community centres.
3. Support the further development of outreach programmes which enable people to have access to nature and the experiences associated with nature.
4. Promote and support efforts by the public and private sector to make protected areas more accessible to the people of South Africa.
5. Encourage those in the public eye, such as television and radio commentators, news editors, advertisers, entertainers, artists, sportsmen and women, religious leaders, politicians, and corporate executives, to popularise biodiversity and the actions needed to conserve it.
6. Use a variety of delivery mediums (e.g. radio, television, newspapers, electronic networks), to distribute information about biodiversity.
7. Integrate issues concerning biodiversity conservation and sustainable use into ongoing efforts to develop a national environmental education system, modifying curricula where necessary.
8. Support and encourage improved training and professional development for teachers, extension officers, and others involved in building awareness about biodiversity.
9. Promote the involvement of interest groups and communities in research, management and development activities relating to the conservation and sustainable use of biodiversity.
10. Strengthen coordination between those involved in increasing awareness about biodiversity, including educational institutions, government departments, natural history museums, businesses, conservation groups and other non-governmental organisations.

4.2. IMPROVING UNDERSTANDING ABOUT BIODIVERSITY

Policy objective 4.2.

Improve the knowledge and understanding of South Africa's biodiversity necessary for its effective conservation.

4.2.1. *Research*

NOTE: Specific areas of research are identified throughout this document in relevant sections, and for the sake of brevity are not repeated here. See in particular strategies articulated for the policy objectives of Goals 1, 2, 3, 4 and 5.

Policy and Strategy

Considerable investment has been made in biological research in South Africa, resulting in a well-developed knowledge base and understanding concerning aspects of the country's biodiversity. However, Government realises that existing biological knowledge is patchy, and that substantially more research is required to improve our understanding. In particular, the interactions between biological and social processes are poorly understood, as are the causes underlying the decline in biodiversity. There has also been an under-investment in the application of research results to biodiversity management.

Government recognises the importance of both basic and applied research, as well as the difficulties in distinguishing between the two. An approach will be pursued that strikes a balance between both basic and applied research, but which aims to accelerate the translation of research results into applied action, and so promote the conservation and sustainable use of biodiversity. An important part of this approach requires improved coordination and networking within and across disciplines and between different programmes.

To achieve this objective, Government, in collaboration with interested and affected parties, will:

1. Through the establishment and coordination of appropriate structures, and the undertaking of a review of the *status quo* of research on biodiversity, develop a multidisciplinary national biodiversity research plan, based upon existing gaps in knowledge and identified conservation and management priorities.
2. (a) Encourage researchers to popularise their work and to disseminate information about biodiversity.

(b) Encourage researchers to place relevant biodiversity information and data in the public domain to facilitate informed, strategic decision-making and to optimise the conservation and sustainable use of biodiversity (see also Section 4.2.4).
3. Develop partnerships with the scientific community to facilitate the effective implementation of the goals and objectives articulated by this policy.

4.2.2. *Inventories*

What are Biodiversity Inventories?

Biodiversity inventorying is the surveying, sorting, cataloguing, quantifying and mapping of landscapes, ecosystems, habitats, populations, species, and genes. Inventories derived from the synthesis of such information give an overview of the state of biodiversity, and enable the identification of key indicators and the analysis of important patterns and processes. Inventories also provide baseline information for the assessment of change and data for conserving and managing biodiversity. Taxonomy, which is the identification, description, classification and naming of organisms, is fundamental to inventorying, and is the core reference system and knowledge base upon which all discussion of biodiversity rests. Bio-systematics, which incorporates taxonomy, includes the study of associated biological disciplines such as evolutionary biology and biogeography, and is also an important component of inventorying.

Biodiversity Inventories in South Africa

Inventories are well-established for some ecosystems and species in South Africa, and there are several institutions such as natural history museums and herbaria dedicated to inventory work. A comprehensive classification of vegetation types exists, as does a computerised database of higher plant species. Inventories of vertebrate species are also fairly comprehensive, particularly within protected areas and for mammals, birds and some fish. However, only a small proportion of the total invertebrate species richness has been described and named, and information on lower plants, microorganisms and genetic diversity is likewise extremely sparse and uncollated. In the marine environment, the taxonomy of fish, and particularly invertebrates, is poorly known.

Inventory work requires skilled personnel such as taxonomists and bio-systematists. There is, however, a dire shortage of suitably trained people in South Africa. There is also inadequate funding support to redress this, and South Africa's museums and other collection-based institutions are facing serious funding problems which threaten existing collections and the future of their professional staff. Many concerns have been expressed by the South African scientific community about this deteriorating situation.

Policy and Strategy

Government recognises that biological inventories are basic to understanding biodiversity. Work being undertaken by universities, natural history museums, technikons, and other collection-based institutions is considered essential to furthering understanding of South Africa's biodiversity and achieving the goals and objectives of this policy. Government is aware of the enormity of comprehensively inventorying the country's biodiversity, and of the significant resources required to undertake this task.

Government's approach to inventorying will be to build and strengthen existing initiatives, link inventory work wherever possible to job creation, use innovative means to accelerate inventory work, and focus inventory efforts on components of biodiversity important for its conservation and sustainable use.

In collaboration with interested and affected parties, Government will:

1. Enhance inventory efforts, giving priority to gaps in knowledge, those components of biodiversity identified as threatened, as well as those components identified to be important for the conservation and sustainable use of biodiversity (See Objective 1.1).

2. Maintain or enhance the capacity of museums and other institutions which undertake biodiversity surveys, and which classify, describe and store collected specimens.
3. Optimise institutional arrangements to ensure that biodiversity inventory work is given the necessary support and commitment by Government.
4. Enhance coordination among government agencies, museums, universities, collection-based institutions, and other organisations and individuals involved with biological inventories.
5. Facilitate the integration of all biosystematic disciplines to ensure that an adequate knowledge base is available for known species.
6. Require foreign and local researchers to lodge voucher specimens or duplicate voucher specimens of all organisms collected or recorded in South Africa with appropriate national collections.
7. Augment local capacity to conduct inventories by:
 - (a) increasing the number and skill of professional taxonomists; and
 - (b) encouraging the development and training of community workers ("parataxonomists") to collect and identify specimens, linking such action to the provision of jobs, skills and opportunities for the poor and disadvantaged.
8. Promote the integration of traditional knowledge wherever possible into existing and proposed inventories.
9. Support inventory work as an important benefit to be derived from biodiversity prospecting agreements.
10. Develop rapid, cost-effective and reliable biological inventory methods and technologies.

4.2.3. *Monitoring and evaluation*

Why Monitor Biodiversity?

Monitoring programmes are required not only to detect and measure changes in biodiversity, but to evaluate the successes and failures of policies, strategies, plans and programmes set up to achieve the conservation and sustainable use of biodiversity. Monitoring is also important to enable those who are custodians of biological resources to take appropriate action to conserve such resources.

Biodiversity Monitoring in South Africa

Many monitoring programmes under way in South Africa are of relevance to the conservation and sustainable use of biodiversity. Several biodiversity monitoring tools are based upon established inventories, including the Red Data Book series, with books on plants, terrestrial mammals, birds, reptiles, amphibians, freshwater fish and butterflies, and the fynbos and karoo biomes; the South African Bird Atlas project; and the Protea Atlas Project. Species-level action plans are additionally being developed at the national, continental and global scale. Several broader environmental monitoring programmes are also under way, including those relating to air and water quality, climatic change, fisheries, land reform, and ecological changes such as fire. These activities are conducted by numerous governmental and non-government agencies, often independently of each other.

Policy and Strategy

Monitoring and evaluation are considered by Government to be essential components of this policy. Numerous programmes are already under way which support this commitment, but there is a need to strengthen these initiatives in line with the objectives of this policy. In particular, Government recognises the need to develop and implement approaches to monitor components of biodiversity considered to require urgent conservation measures and those which offer the greatest potential for sustainable use.

To achieve the objective, Government, in collaboration with interested and affected parties, will:

1. Promote and coordinate the development of international, national, regional and local monitoring programmes and strategies to assess biological trends, the impacts of human activities on biodiversity, and the successes or failures of conservation and sustainable use programmes. Monitoring programmes will, where appropriate:
 - (a) develop and link up to the development of a national biodiversity information network;
 - (b) develop and implement cost-effective approaches such as the use of biodiversity indicator groups and other early warning stress indicators;
 - (c) update and review Red Data books, in line with appropriate international standards; and
 - (d) track changes in management responses to the conservation and sustainable use of biodiversity.
2. Report on biodiversity trends, as part of "State of Environment" reports.
3. Maintain and strengthen the capacities of institutions engaged in monitoring components of biodiversity, and improve coordination among such bodies.

4. Support efforts to build the capacity and draw on the knowledge of local communities and volunteers with respect to undertaking monitoring exercises.
5. Establish assessment panels or monitoring committees, comprising representatives of non-governmental organisations, community groups, industry, the scientific community, and government.
6. Support the independent monitoring and evaluation of biodiversity conservation and sustainable use policies, programmes and projects.

4.2.4. *Data and information*

Policy and Strategy

A substantial amount of data and information that is necessary for the conservation of biodiversity and the sustainable use of biological resources exists in South Africa. This is held by many governmental and non-governmental agencies in herbaria or museum collections, on electronic databases, and in libraries or other resource centres. However, much of this information is in a form which cannot be easily used by managers, researchers, decision-makers or the general public. The situation is aggravated by the fact that many of the initiatives to collect data and information on biodiversity are uncoordinated. Government will take measures to redress this situation and to improve the accessibility of data and information for those who need it.

To achieve the objective, Government, in collaboration with interested and affected parties, will:

1. Investigate and implement the development of a national biodiversity information network to enhance the collection, sharing, analysis and distribution of data and information required for the conservation and sustainable use of biodiversity.
2. Establish a national focal point within the Department of Environmental Affairs and Tourism to act as a clearing house for technical and scientific information relating to the conservation and sustainable use of biodiversity.
3. Ensure that data and information generated by publicly funded studies is made available to potential users through appropriate arrangements. Such arrangements will take into account the need for differential access to information, and will distinguish between information required for research purposes and that which could be used for commercial gain.
4. Maintain, improve and wherever possible standardise and digitise existing biodiversity databases.
5. Support the establishment or strengthening of local resource centres to make information on biodiversity more accessible, usable, and locally relevant.

4.2.5. *Traditional knowledge*

South African Traditional Knowledge

South Africa has a vast traditional knowledge of biodiversity which has developed over millennia. Sadly, much of this knowledge has been fractured by South Africa's colonial and apartheid past and by increased urbanisation, and today only pockets of traditional knowledge still exist, generally amongst older people in rural areas and traditional healers.

Customary practices to maintain or enhance biodiversity have similarly been impacted by previous policies, particularly in instances where people were forcibly removed from their land and denied access to resources such as medicinal and edible plants, thatching grass, and hunting and grazing grounds. Past policies also resulted in the banning of traditional medicine, despite the fact that over 80% of South Africans depend upon traditional herbal remedies for their primary health care.

An issue of particular contention relates to the fact that the considerable benefits which modern society has gained from the traditional knowledge and innovations of South Africa's people have resulted in few, if any, of such benefits being returned to the people from whom knowledge was derived. Indigenous knowledge of plants and their patterns of use assisted colonial botanists in South Africa to identify species of commercial potential, the benefits of which were reaped solely by foreign companies. There is currently substantial interest from foreign companies in the genetic resources of South Africa, and firm evidence that sampling guided by traditional knowledge substantially increases the efficiency of screening plants for medicinal treatments. However, there is no legal protection in South Africa for traditional knowledge, which is often not confined to a single community or person. Furthermore, conventional intellectual property right regimes do not correspond well to the innovations of traditional cultures.

There is therefore a clear need to strengthen traditional knowledge, practices and cultures by protecting and recognising the value of such systems and preventing their loss. This may be achieved by ensuring that benefits arising from the innovative use of traditional knowledge of biodiversity are equitably shared with those from whom knowledge is gleaned, and also by incorporating traditional knowledge and practices into biodiversity research and conservation programmes.

Policy and Strategy

Government recognises the irreplaceable and unique value of the traditional knowledge, practices and cultures of South Africa's people, and is acutely concerned about the rapid loss of such systems. The need to formally recognise and protect traditional knowledge is considered to be an issue which needs urgent attention. The adoption of measures to enable equitable benefit-sharing is a crucial part of this approach, as described for Goal 3.

To respond to these concerns, Government, in collaboration with interested and affected parties, will:

1. (a) Review and where appropriate modify national policies and legislation to ensure that they support the rights of holders of traditional knowledge;
 - (b) Investigate, through appropriate structures, the development of a system to provide legal protection for collective intellectual property rights; and
 - (c) Explore further mechanisms to protect traditional knowledge, practices and cultures concerning the conservation and sustainable use of biodiversity.
2. (a) Promote the development of a code of ethics for researchers engaged in work concerning traditional knowledge, practices and cultures;

- (b) Ensure that information concerning traditional knowledge, practices and cultures is used for research only with the consent, cooperation and control of holders of that knowledge. Wherever possible, the use and collection of such knowledge must result in social, economic or environmental benefits to the traditional owners through formal prior informed consent procedures and mutually agreed terms;
- (c) Encourage, with the consent and involvement of those from whom knowledge is gleaned, the recording of traditional knowledge, practices and cultures concerning the conservation and sustainable use of biodiversity; and
- (d) Ensure that this recorded knowledge is made accessible to those people from whom it is gleaned.
3. Ensure that curricula promote an understanding and appreciation of the importance of knowledge, practices and cultures that promote the conservation and sustainable use of biodiversity.
4. Promote the integration of traditional knowledge and in particular previously ignored and/or undermined cultural knowledge and practices concerning the conservation and sustainable use of biodiversity into scientific research programmes and formal sector innovations.

4.3. DEVELOPING MANAGEMENT CAPACITY



Policy objective 4.3.

Enhance the capacity necessary to conserve and use South Africa's biological diversity sustainably

Biodiversity Capacity Needs in South Africa

A major constraint to the implementation of South Africa's biodiversity policy is the dearth of trained South Africans to carry out the tasks required, and a lack of available career opportunities in biodiversity management. A strong cadre of natural scientists exists in South Africa, but few researchers are exposed to the practical problems of management, or have the breadth of knowledge required to address biodiversity conservation problems. There is also a dire shortage of taxonomists in the country. The situation is further aggravated by the fact that the recruitment of black South Africans to the conservation sector has been poor, largely as a result of previous discriminatory policies, and the restricted career opportunities offered by the sector. The lack of capacity to implement conservation measures is particularly stark at the local level, where many of the actions to remedy biodiversity loss will be required.

Policy and Strategy

NOTE: Specific training needs are identified throughout this document in relevant sections, and for the sake of brevity are not repeated here. See in particular strategies articulated for Objectives 1.4, 1.8, 2.2, 4.1, 4.2, and 6.

Government is committed to human resource development and to providing training and developing skills required for biodiversity management. Training will be done in partnership with educational institutions, the private sector and non-governmental organisations, and will be provided in formal institutions, at the workplace through in-service training programmes, and at a local level. Training is recognised as important not only for those charged with managing the use of natural resources, but for senior decision-makers, industrialists, and local communities.

To achieve this, Government, in collaboration with interested and affected parties, will:

1. Encourage a review and reorientation of the curricula of existing training programmes concerning biodiversity conservation and human interactions with the natural environment, with particular emphasis on multidisciplinary approaches.
2. Support the development of short-term training courses in biodiversity management tailored to the needs of particular groups such as business, communities, teachers, resource managers, non-governmental organisations, and senior decision-makers.
3. Prevent the loss of skilled expertise from the field of biodiversity management, maintain existing skills and expertise, and improve the capacity of public servants, non-governmental organisations, and communities to conserve and sustainably use biodiversity.
4. Develop strategies to improve training and professional development in careers compatible with the conservation and sustainable use of biodiversity.
5. Provide incentives to attract qualified individuals to careers in biodiversity management by ensuring that biodiversity management offers a coherent career path, with specific emphasis on the training of people from disadvantaged communities.
6. Support existing institutions that provide training for biodiversity management, with specific emphasis on those institutions that have historically been denied opportunities.

GOAL 5:**CREATE CONDITIONS AND INCENTIVES THAT SUPPORT THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY**

The effective implementation of the biodiversity policy requires the creation of conditions and incentives that support the conservation and sustainable use of biodiversity. South Africa's approach towards achieving this goal has two main components:

- promoting and developing economic opportunities that are compatible with and which complement the conservation and sustainable use of biodiversity; and
- creating and implementing incentives that support the conservation and sustainable use of biological diversity.

5.1. BENEFICIATING BIODIVERSITY **Policy objective 5.1.**

Promote and develop economic opportunities that are compatible with and which complement the conservation and sustainable use of biodiversity.

Adding Economic Value to South Africa's Biodiversity

Examining the economic aspects of biodiversity is becoming increasingly important within the South African context. As the custodian of a national asset, the State has a responsibility to increase the financial investments required to conserve biodiversity. However, this must be reconciled with the fact that the basic needs of South Africa's people have not yet been met. Innovative ways must therefore be found to add to and reinforce the fundamental economic value to biodiversity, and to promote and develop economic activities that are compatible with and which complement the conservation and sustainable use of biodiversity.

There are many opportunities to do this. In some instances, such as the informal medicinal plant trade, a thriving industry exists but the importance of traditional medicine for primary health care is poorly recognised. Consequently, few measures are in place to ensure that resources are harvested sustainably, that the cultivation of harvested species is promoted, and that the local economic value of such resources is maximised. In other cases, such as biodiversity prospecting, opportunities to reap benefits are not optimised because of the absence of an enabling policy framework that controls access to genetic resources and sets conditions for benefit-sharing and sustainable use. This uncertainty is a major deterrent to potential investors. And in industries such as tourism, South Africa's natural beauty and well-developed protected area system are renowned drawcards for tourists, but the full spectrum of benefits arising from tourism-related activities are often only partially realised.

These examples, and many others such as the under-development of indigenous crops (*e.g.* sorghum, millet), livestock breeds (*e.g.* ostrich), floral varieties, and ornamental plants point towards the fact that South Africa has largely failed to develop and benefit from its biological diversity. This has been due in part to the country's isolation from the international community and the effect of accompanying sanctions, but also because there have been few incentives established, and little interest in the domestic

development of such resources. Many missed opportunities have resulted from this neglect. Clearly, we can ill-afford not to reap the full spectrum of benefits available from the inordinate potential value of our biodiversity.

Policy and Strategy

Government recognises that South Africa's biodiversity presently provides substantial economic benefits for its people, and holds remarkable future economic potential if adequate investments are made in its further development and conservation. There can be few countries in the world which have the combined benefits of democracy, a comprehensive scientific capacity and knowledge base, a well-developed private sector, a well-established system of protected areas, and most importantly, some of the most biologically diverse resources to be found on Earth. Government policy will require that these resources are used to best effect in the alleviation of poverty and conservation of the country's biodiversity, and will enlist the support of the private sector in doing so wherever this is appropriate.

To achieve the objective, Government, in collaboration with interested and affected parties, will:

1. (a) Continue to support programmes that utilise indigenous and traditional wildlife sustainably for subsistence purposes and commercial gain;
- (b) Encourage the development of indigenous and traditional livestock and crop utilisation programmes, natural product industries, and agricultural programmes which show economic potential and which create economic and other incentives for the retention, rehabilitation, maintenance and management of natural habitats; and
- (c) Support research which identifies new areas of economic potential for South Africa's indigenous and traditional biological and genetic resources.
2. Ensure the rapid establishment of institutional structures and legal arrangements to control access to genetic resources, and to thereby create the conditions for equitable benefit-sharing arrangements to be developed.
3. Through effective implementation of its tourism policy:
 - (a) develop tourism as a sustainable and responsible economic activity;
 - (b) support the integration of tourism into broader land-use plans, and the development of tourism as a competitive form of land use;
 - (c) promote the linking of tourism benefits to the environmental products it depends upon, and the cross-subsidisation of conservation by tourism;
 - (d) require tourism projects to be subject to Integrated Environmental Management procedures; and
 - (e) encourage the development of partnership tourism ventures between local communities, the private sector and conservation agencies.
4. Recognise and quantify the local economic value derived from the use of biological resources (e.g. traditional medicines, building materials, wild food) by the informal sector in

development and land-use planning efforts. This will include consideration of the social, economic and environmental costs and benefits of having to use alternative resources if natural biological resources are lost or degraded.

5. Recognise and quantify the direct and indirect economic costs and benefits derived from conserving and using biodiversity sustainably, including the conservation of protected areas.
6. (a) Introduce measures to encourage local communities to add economic value to products harvested from the wild, or cultivated off site, whilst ensuring the sustainable use of such resources;
- (b) Promote the local beneficiation of genetic resources developed for commercial gain; and
- (c) Promote the development of value-added indigenous products, and investigate the formation of marketing and information networks to broaden access to local, regional and international markets.
7. Support efforts of the Medicines Control Council to develop a regulatory framework for the approval of traditional herbal medicines.
8. Balance the need to encourage private sector investment in South Africa's genetic resources through conferring intellectual property rights for novel inventions with that of ensuring equitable benefit-sharing and the transfer of appropriate technology.

5.2. INCENTIVES

Policy objective 5.2.

Create and implement incentives that support the conservation and sustainable use of biological diversity.

The Importance of Incentives

South Africa has a substantial amount of legislation in place governing the use and conservation of natural resources. However, as is the case for other countries, these "command and control" mechanisms have not been adequate to address the underlying forces resulting in the loss of biodiversity.

New approaches, such as those embraced by the Convention on Biological Diversity, are increasingly turning towards the use of incentives as instruments and mechanisms to induce people to change their behaviour. Because people behave rationally by basing decisions on an assessment of costs and benefits, the introduction of incentives by Government is an important way in which people can be motivated to conserve and use biodiversity sustainably.

Some incentives are direct, and can be either financial, such as providing subsidies to restore threatened habitats, or in kind, such as providing nursery plants to traditional healers. Other incentives are indirect, and may be fiscal (*e.g.* tax breaks for funding conservation projects), service-orientated (*e.g.* awareness raising and skills training), voluntary (*e.g.* private nature reserves), or social (*e.g.* improving quality of life through tenure reform). In contrast, disincentives encourage desirable behaviour. A pollution tax for example, motivates businesses to reduce pollution. Some incentives, sometimes called "perverse incentives", actively encourage the depletion of biodiversity (*e.g.* drought relief subsidies).

Incentives for conserving biodiversity already exist in South Africa, and are applied with varying success. For example, conservancies, private nature reserves and South African Natural Heritage Sites accord recognition to landowners taking actions to conserve biodiversity. Similarly, education programmes and extension services provide motivational incentives to conserve biodiversity. Conservation strategies determine priorities and provide direction, and various tax concessions, aid and compensation schemes provide financial incentives for conservation. However, the effectiveness of these mechanisms is not known, and there are many "perverse incentives" in place which may counter such efforts.

Policy and Strategy

Government is aware of the need to pursue innovative approaches to prevent the further loss of biodiversity in South Africa, and is of the opinion that regulatory approaches are a necessary, but insufficient mechanism to ensure biodiversity conservation. In conjunction with legislation, the use of economic instruments as well as non-fiscal incentives such as education and tenure reform, are considered important mechanisms to be used for the conservation and sustainable use of biodiversity, and the promotion of new uses of biological resources. In introducing new incentives, Government will give consideration to (a) the need to remove existing incentives that discourage biodiversity conservation (so-called "perverse incentives"); and (b) the need to use an array of different instruments, based upon bioregional and social characteristics as well as the nature of the threat to biodiversity, to encourage biodiversity conservation in different areas.

Government recognises that there are several initiatives underway in other policy processes which are considering the introduction of incentives and disincentives (*e.g.* taxes, levies) related to the conservation and use of natural resources. Such proposals will be coordinated and streamlined to ensure that Government adopts a uniform, and rational approach to the introduction of incentives and disincentives.

Government acknowledges that insufficient financial resources are presently invested in conserving biodiversity and ensuring its sustainable use. As the custodian of a national asset, and party to the Convention on Biological Diversity, the State recognises its responsibility to increase, through a number of external and internal financing mechanisms, the financial resources necessary to achieve the goals of this policy.

To achieve the objective, Government, in collaboration with interested and affected parties, will:

1. Optimise the use of existing funds allocated for conservation-related activities, based upon identified priorities for biodiversity conservation (see Chapter 4).
2. Identify and progressively remove incentives that encourage the loss of biodiversity and the unsustainable, inefficient, and inequitable use of biological resources, taking into consideration social, economic and environmental costs and benefits.
3. Maintain, adjust or develop new financial and other incentives that support the conservation and sustainable use of biodiversity, and stimulate local stewardship of terrestrial, aquatic and marine and coastal areas.
4. Investigate and institute innovative mechanisms to raise new finances for biodiversity conservation, including:

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- (a) the use of taxes, levies, and charges linked to activities directly using and/or affecting biodiversity, to generate revenue for biodiversity conservation;
 - (b) the establishment of a Biodiversity Trust Fund;
 - (c) royalties generated through biodiversity prospecting activities; and
 - (d) the introduction of conditions and incentives (*e.g.* tax relief) to strengthen the involvement of the private sector in the conservation and sustainable use of biodiversity.
5. Develop measures that would enhance the capacity of existing conservation agencies in both the public and private sector to receive, generate, invest and employ funds to promote their objectives, and to enter into contractual arrangements with private landowners.
 6. Support efforts of the Land Reform Programme to encourage investment in land resources through extending security of tenure to all South Africans.
 7. Support the development of methods to determine the social, economic, and environmental values of biodiversity, and the application of such methods to support the conservation and sustainable use of biodiversity.

GOAL 6.**PROMOTE THE CONSERVATION AND SUSTAINABLE USE OF
BIODIVERSITY AT THE INTERNATIONAL LEVEL****Policy and Strategy**

Government recognises that the conservation of biodiversity is a global issue, requiring global action. Countries depend upon each other's biodiversity, and the loss of biodiversity represents a loss to all people. Moreover, the impacts of ecosystem degradation reach beyond national boundaries, requiring transfrontier cooperation to be a necessary component of this policy.

In ratifying the Convention on Biodiversity, Government demonstrated a commitment to safeguarding the planet's biotic wealth, recognising that the conservation of global biodiversity is a common concern of all nations. This commitment is reflected in the active participation of South Africa in the range of international agreements to which the country is a party, and in numerous other scientific and technical collaborations. Nonetheless, years of political isolation from the international community have meant that South Africa must strengthen efforts to cooperate on environmental matters at the international level. In addition to global cooperation, Government will continue to work as a member of the Africa group in international forums, of the Organisation of African Unity, and of the Southern African Development Community, to solve the problems of biodiversity loss on the continent and in the region, and to advance the interests of Africa internationally.

To achieve the objective, Government, in collaboration with interested and affected parties, will:

1. Review the status of South Africa's participation in all bilateral and multilateral agreements relevant to the conservation and sustainable use of biodiversity, and ensure that activities undertaken are mutually supportive and harmonised.
2. Promote the effective implementation of existing international agreements of relevance to the conservation and sustainable use of biodiversity, and in particular the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), the Convention on Wetlands of International Importance, Especially as Waterfowl Habitat (the "Ramsar Convention"), and the Convention on the Conservation of Migratory Species of Wild Animals.
3. (a) Actively participate in new agreements and arrangements that are relevant to the conservation and sustainable use of biodiversity, and that are in keeping with the needs and priorities of South Africa's people;

(b) Promote the speedy ratification of agreements relevant to the conservation and sustainable use of biodiversity to which South Africa is a signatory (e.g. The World Heritage Convention, the Convention to Combat Desertification, the Framework Convention on Climate Change); and

(c) Support the participation of civil society in negotiations and discussions concerning the development and ratification of new international agreements.

4. Support efforts to establish a Southern African regional forum to consider biodiversity issues of relevance to the region, including international funding, transfrontier conservation initiatives, regional approaches to regulate access to genetic resources, joint management strategies, regional tourism linkages, and bioregional approaches to environmental management.
5. Maintain and strengthen South Africa's participation in multilateral efforts concerned with the conservation and sustainable use of biodiversity, through international organisations such as the United Nations Commission on Sustainable Development, the United Nations Environment Programme, UNESCO, the Food and Agriculture Organisation, the International Maritime Organisation, the Global Environment Facility, the World Conservation Union, as well as through various international programmes.
6. (a) Encourage collaboration among the private sector, research institutions, government and non-governmental organisations, and communities to promote the transfer of environmentally sound technologies; and
(b) Identify and implement steps to remove impediments to technology transfer.
7. Compile a national inventory of all governmental and non-governmental areas of international cooperation concerning the conservation and sustainable use of biodiversity, with a view to identifying gaps in cooperation and strengthening existing efforts.
8. Enhance international collaboration in scientific and technical research related to biodiversity.
9. Promote and support the development of educational and training courses, workshops, and other professional development exercises on biodiversity management of relevance to the southern African region and other developing countries.
10. Pursue external financing sources through bilateral and multilateral agencies, the Global Environment Facility, and the private sector, to secure funding for programmes and projects identified as priorities by the South African community.

In accordance with the Constitution, encourage the participation of non-governmental organisations in international fora convened to report on and discuss existing agreements relating to the conservation and sustainable use of biodiversity, and in international efforts to implement the Convention.

CHAPTER 4.

IMPLEMENTING THE POLICY

This section describes the implementation of the policies articulated in this document. It is divided into six parts:

- an introduction;
 - an identification of the key players, and their roles in implementing the policy;
 - a discussion of the existing and future legislative framework;
 - institutional changes required;
 - funding sources; and
 - the priority action for implementation.
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4.1. Introduction

The implementation of the Convention on Biological Diversity, through this policy and strategy, lies in the sphere of responsibility of a variety of agencies, from national through to provincial and local level. In terms of South Africa's Constitution, many functions of relevance to biodiversity conservation are a concurrent legislative competence of national and provincial government. The Constitution also demarcates several relevant areas as being an exclusive national competence, such as marine resources, national parks, and national botanical gardens; of exclusive provincial jurisdiction, such as provincial planning; and provides for the administration of certain functions at the local government level, such as beaches and municipal parks. This means that cooperative governance within national, provincial, and local spheres will be necessary for the effective implementation of this policy. Cross-sectoral cooperation within each sphere of government will also be crucial, given that biodiversity issues are of relevance to virtually every government institution.

Many of the actions required by this policy are already being financed and implemented by the Department of Environmental Affairs and Tourism, by the provincial departments of environment and conservation, and by various other national and provincial departments. However, several new tasks are required which are essential to South Africa meeting her international obligations, and to achieving the goals and objectives of this policy. For these tasks to be fulfilled it is imperative that the need for new and additional financial resources be taken into consideration in the allocation of future government department budgets.

One of the most far-reaching provisions of the Convention on Biological Diversity requires Parties to integrate the conservation and sustainable use of biodiversity into relevant sectoral or cross-sectoral plans, programmes and policies. A key recommendation to emanate from this policy proposes that this be achieved by the drafting of a biodiversity plan by relevant government institutions, based upon guidelines developed by the Department of Environmental Affairs and Tourism. It is also proposed that such plans reflect the integration of biodiversity considerations in relevant sectoral budgets. A political commitment to achieving this, through the allocation of necessary budgets, is fundamental to the successful implementation of this policy.

4.2. Roles of the Key Players

4.2.1. The role of Government

NATIONAL GOVERNMENT

The Department of Environmental Affairs and Tourism

As the institution charged with administering the Convention on Biological Diversity, the Department of Environmental Affairs and Tourism will play a strong leadership role in ensuring that the provisions of this policy are implemented effectively. Through its Environmental Management and Sea Fisheries Chief Directorates, the Department is already actively engaged in implementing many of the provisions required by the Convention. New actions articulated by this policy will, however, require the Department to be strengthened, existing priorities to be realigned, and new and additional financial resources to be committed to and by the Department.

As the "champion" of biodiversity, the Department will play a proactive role in:

- promoting global, regional, and national cooperation and coordination with regard to the conservation of biodiversity;
- formulating and reviewing policy;
- strengthening communication networks with the provinces, and other national government departments and institutions;
- promoting and facilitating the integration of biodiversity considerations into sectoral and cross-sectoral plans, programmes and policies;
- establishing, administering and managing required coordinating structures; and
- organising the participation of national and provincial government in relevant international fora.

Other national government departments

Because of the cross-sectoral nature of biodiversity, several other national government departments will play a vital role in the implementation of this policy. These include the Departments of Agriculture; Land Affairs; Water Affairs and Forestry; Trade and Industry; Foreign Affairs; Health; Transport; Housing; Welfare and Population Development; Arts, Culture, Science and Technology; Finance; as well as the South African National Defence Force. Of crucial importance will be their commitment to cooperating with one another, and to developing sectoral-specific plans and budgets to reflect how biodiversity considerations will be incorporated into the activities of departments.

National statutory bodies

The two national statutory bodies directly affected by the provisions of this policy are the National Botanical Institute and the National Parks Board. These agencies will continue to play a crucial role in ensuring that South Africa's biological heritage is conserved and used sustainably. To achieve the goals of this policy, this may require in some instances that existing priorities be reassessed. An important task will be to strengthen cooperation between the National Parks Board and provincial conservation agencies, so as to enable an effective and representative protected area system to be developed.

PROVINCIAL GOVERNMENT

In many respects, the functions of the provincial government with regard to the implementation of this policy will be similar to those of national government, although emphasis at provincial level will be on formulating policies and strategies which are locally applicable and which are in accordance with national biodiversity objectives. Furthermore, the provinces will play a far greater role in undertaking the execution of the policy. Many of the actions required by the policy are already being undertaken by the provincial environment and conservation departments. However, such departments are over-stretched and their execution of new tasks will require considerable capacity to be built and additional financial resources to be provided.

Through the provincial legislature and necessary coordinating structures, environment and conservation departments in each province will play an important role in developing strong collaboration between other departments responsible for activities concerning the conservation and use of biodiversity within the province. Other provincial departments will also be affected by the provisions of this policy through measures introduced by their national departments, and by legislation.

In addition to these roles, provincial environment and conservation departments will continue to play an essential function throughout the provinces in terms of providing conservation extension services, regulating and monitoring the use of biological resources, preventing the loss of biodiversity, and developing and managing protected areas. Their primary function will be to conserve the country's biodiversity, and to participate in and coordinate efforts so as to ensure the development and management of an effective and representative protected area system. An additional function of conservation agencies will be to promote sustainable development outside protected areas, through the forging of appropriate partnerships with communities, non-governmental organisations (NGOs), the private sector, and other government departments. Building such partnerships may require the involvement of communities in the management of protected areas.

LOCAL GOVERNMENT

Local government is faced with particular difficulties in implementing this policy. In rural areas especially minimal capacity, infrastructure, or resources exist to enable many of the provisions of this policy to be implemented effectively. According to local circumstances and capacity, some functions of local government will be to:

- ensure that biodiversity considerations are effectively integrated into local strategies, plans and programmes;
- institute and participate in public education, awareness and training programmes;
- develop management plans for local resources that are under pressure;
- ensure that biodiversity considerations are integrated into land-use planning procedures for rural and urban areas; and
- encourage and prepare municipal open space systems which play a positive role in conserving and using biological resources sustainably.

4.2.2. The role of other key players

Strong partnerships will be required not only between government agencies, but between non-governmental organisations, community-based organisations, women's groupings, holders of traditional knowledge, the private sector, the scientific community, and private individuals.

This support is especially needed in light of the limited capacities of government to implement the required steps. Government's policy will be to enter into partnership arrangements wherever necessary with different groupings, and to ensure that mechanisms and procedures are in place which facilitate this cooperation.

The scientific community

The knowledge and expertise contained within South Africa's universities, museums, conservation and other government agencies, parastatals, non-governmental organisations, and other research institutions is fundamental to implementing this policy. The primary role of the scientific community will be to provide the information required to achieve the goals and objectives of this policy. It is the intention of Government to build on this body of excellence to improve knowledge and understanding of South Africa's biodiversity, and to draw upon available capacity to provide guidance to policy-makers and resource managers.

Business and industry

Business and industry will play several important roles in the implementation of the policy. Among others these will include full compliance with the nature conservation and environmental regulations prescribed by government; the acceptance of social responsibility for biodiversity by adopting additional voluntary measures wherever possible and appropriate; and the development of economic activities that support the conservation and sustainable use of biodiversity.

Non-governmental organisations

Many successful efforts in South Africa to conserve and sustainably use biodiversity have come about through the commitment of conservation and development NGOs. Such organisations will continue to play a crucial role in realising the goals and objectives of this policy, through the implementation of specific projects and programmes. NGOs will also provide an essential independent monitoring and "watchdog" role, to ensure adherence to the commitments articulated in this policy. Those with insights into the implementation of specific aspects of the policy will be invaluable in providing advice and expertise to Government. A particularly crucial role will be played by those NGOs engaged in development work, and in capacity-building and environmental educational and training programmes.

Communities

Communities, hitherto excluded from policy discussions concerning biodiversity conservation, are also expected to play a vital role in the conservation and sustainable use of biodiversity. How this is effected will vary from community to community. In some instances, communities will play an important role in managing and using local resources to ensure their conservation and sustainable use. In other cases, local knowledge and skills will be invaluable in assisting monitoring and inventory work, such activities also providing jobs for people. And in certain circumstances, communities have a key role to play in rehabilitating degraded ecosystems. Fulfilling such actions will require increased and improved training opportunities to be created, and the creation of related economic opportunities to allow for skills to be used.

Traditional healers, farmers and others holding traditional knowledge

Traditional healers, farmers, and others holding traditional knowledge will play an especially important role in developing guidelines for the protection and use of traditional knowledge, and procedures for benefit-sharing. In addition, these groups will play a vital monitoring role to ensure that provisions of this policy concerning traditional knowledge and benefit-sharing are implemented satisfactorily. This will require improved coordination and mobilisation between relevant organisations and individuals, and support to enable such actions to occur.

Women

Women, and rural women in particular, play a vital role in the conservation and sustainable use of biodiversity. Often being responsible for gathering fuelwood, building materials, medicines or food, they are also frequently most directly affected by a local loss in biodiversity. Their involvement in the implementation of this policy and strategy will be key to ensuring that the use of resources for subsistence purposes is sustainable, and that livelihoods are secured. As mothers and educators, women also have a central role to play in raising awareness amongst future generations as to the importance and value of conserving and sustainably using the country's biodiversity. Their role in decision-making requires particular emphasis, given the fact that women have thus far been largely marginalised from decisions concerning the conservation and sustainable use of South Africa's biodiversity.

4.3. Legislation

4.3.1. International framework

South Africa's ratification of the Convention on Biological Diversity on 2nd November 1995 has several legal implications which need to be considered within the framework of the country's domestic legislation. In terms of the Constitution, South Africa can be and is bound by international agreements¹¹. However, because of the nature of the Convention, which sets out broad principles rather than specific legally binding provisions, a further process is required to give the agreement full effect. This would determine the extent to which existing domestic legislation meets the specific requirements of the Convention, and the need for new or amended domestic legislation to be enacted.

4.3.2. Constitutional implications

The Constitutional scheme

The proposals articulated in this policy and strategy cut across most national government departments and impact on national, provincial and local government. Thus it is necessary to consider the policy in the context of the Constitution generally, and specifically with regard to the allocation of powers and functions entrenched therein.

The constitution provides for a single sovereign state in which the national government has full powers to pass legislation on matters other than those which fall within a functional area of the exclusive competence of the provinces. National government also has powers to pass legislation

¹¹ Constitution of the Republic of South Africa. 1996. Act 108 of 1996. Sections 2 and 231 (4) and (5).

on matters which are not expressly assigned. The provinces have only those powers and functions allocated to them by the Constitution.

The Constitution allocates certain powers concurrently to national and provincial spheres of government, and certain powers exclusively to the provinces. These are described in Schedules 4 and 5 respectively of the Constitution. Of importance is the fact that machinery is provided by the Constitution to enable national and provincial spheres of government to perform functions for other levels of government on an agency or delegation basis. This may be through the delegation of executive functions - whereby the delegating agency retains responsibility for the function; or through assignment - in which case legal and executive functions and powers are handed over to the agency in question. Agencies outside of government would be given specific tasks on a contractual basis.

Concurrent competences of national and provincial government

With some exceptions, most functional areas of relevance to the conservation and use of biodiversity are set out in Schedule 4 of the Constitution, which describes functional areas of concurrent national and provincial legislative competence. These include such areas as agriculture, environment, nature conservation, pollution control, regional planning and development, soil conservation, urban and rural development, and tourism.

Concurrent competence means that both national and provincial spheres of government are empowered to pass and implement legislation relating to specific functional areas. Where there are conflicts between national and provincial government concerning a functional area listed within Schedule 4, certain rules are provided to resolve such conflicts¹². Of relevance is a "national override" provision which states that national legislation would prevail over provincial legislation if:

- (a) the national legislation deals with a matter that cannot be regulated effectively by legislation enacted by the respective provinces independently;
- (b) the interests of the country as a whole require that a matter be dealt with uniformly across the nation (*e.g.* the setting of national norms and standards); or
- (c) the national legislation is necessary for such matters as the protection of the environment.

Exclusive provincial competence

Schedule 5 of the Constitution sets out those functional areas in which the provincial government enjoys exclusive competence. Although the bulk of functional areas relevant to the conservation and use of biodiversity are of concurrent national and provincial competence, some relevant functional areas, including provincial planning, are included in Schedule 5.

Where a power has been allocated to the exclusive competence of provincial government, national government may intervene and pass legislation, but only where such legislation fulfils certain constitutionally mandated purposes (*e.g.* the setting of national standards)¹³. The Constitution empowers provincial government to legislate on any matter outside of the functions already listed in the Schedules where that matter is expressly assigned to the provinces by national legislation.

¹² Section 146 of the Constitution.

¹³ Section 44 of the Constitution.

The executive authority of the provinces includes the authority to implement provincial legislation, implement national legislation within the functional areas listed in Schedules 4 and 5, develop and implement provincial policy and coordinate provincial departments and administration. However, a province has executive authority only to the extent that it has the administrative capacity to assume effective responsibility. Pursuant to section 100 of the Constitution, the national executive enjoys a power of supervision over the provincial administration, enabling the national executive to intervene where the province cannot or does not fulfil an executive obligation. The national government is however required to assist provinces, by legislative and other measures, to develop the administrative capacity needed for the effective exercise of their powers and performance of their functions.¹⁴

The "environmental right"

A key human right that is enshrined within the Bill of Rights of South Africa's Constitution is the so-called "environmental right". This newly developed right has important implications for the development of legislation to give effect to the Convention on Biological Diversity.

It states:

"24. *Everyone has the right -*

(a) to an environment that is not harmful to their health and well-being; and

(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -

(i) prevent pollution and ecological degradation;

(ii) promote conservation; and

(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Part (a) of this clause grants a substantive environmental right ensuring that legislation which is potentially harmful or which may have harmful environmental consequences can be repealed. This clearly has important implications with regard to conserving biodiversity, and minimising adverse environmental impacts.

Part (b) is less clear, in that it represents more of a directive principle than a right, and in many ways underscores the *status quo*. Although it imposes a positive obligation on the state to pass legislation which supports environmental protection, an individual would not be able to use the clause to claim any rights. Thus, while supportive of the objectives of the policies articulated in this document, the clause is limited.

Property rights

The recognition of property rights has been a historical cornerstone of South African common law, and has recently found expression in the Bill of Rights of the Constitution. Because much of South Africa's biodiversity falls within private ownership, it is crucial to consider the property clause of the Bill of Rights in the context of this White Paper.

Historically, under South African common law, the state has had authority to regulate and control the manner in which any property, including biological resources, is conserved and exploited. The property clause of the Bill of Rights reinforces this common law position, but

¹⁴ Section 125 (3) of the Constitution.

provides that no-one may be "deprived" of property unless this is in terms of a law of general application and is not arbitrary. The section further stipulates that compensation is only payable if there is expropriation, and does not refer to the situation where there is only deprivation. This implies that the state through legislation is empowered to introduce regulations on properties to achieve the conservation and sustainable use of biodiversity.

4.3.3. Limitations of existing legislation

Fragmentation

South Africa has a substantial body of law regulating the conservation and use of biodiversity. However, as is the case for several other areas of environmental policy, biodiversity cuts across many diverse sectors and areas of public administration. The result is an extremely high degree of fragmentation, with legislation being spread across many different departments, at both national and provincial levels. Exacerbating the problem is the lack of national norms and standards from which legislation for biodiversity can be harmonised.

Conflict of interest

Also of concern is the fact that legislation is often conflicting, a problem heightened by the fact that a number of the government departments responsible for enforcing compliance with environmental regulations are also charged with promoting the activities that they are supposed to regulate. This situation has resulted in many calling for national norms and standards to be set and regulated outside of the department promoting the activity. Various mechanisms have been suggested to accomplish this, including the establishment of an independent inspectorate. Critical is the need to obtain clarity on the roles and responsibilities of different government agencies. Such clarity will be forthcoming from the general national environmental policy.

Ineffective enforcement

Although a substantial amount of environmental legislation is in place in South Africa, poor enforcement renders much of it ineffectual. Compounding the problem are the often inappropriate penalties imposed for infringing legislation, and the lack of capacity within government agencies to monitor infringements. These constraints have serious implications for the effective implementation of the policies articulated in this document.

4.3.3. Gaps within existing legislation

Lack of an integrated and holistic approach to biodiversity

The Convention on Biological Diversity sets out important new approaches to biodiversity which have yet to be uniformly reflected by South African legislation. Underpinning international thinking is the importance of an integrated and holistic approach to biodiversity, which considers the range of political, economic, and ecological levels at which actions need to be targeted, and supports sectoral and cross-sectoral interventions to achieve conservation and sustainable use. For example, biodiversity incorporates ecosystem, species, and genetic diversity as well as landscape diversity, but South African legislation has focussed largely on species diversity, and predominantly on mammal and plant diversity. Similarly, the importance of integrating biodiversity into all spheres of decision-making, and within and across different economic sectors has received little attention.

Biodiversity outside of protected areas

A major gap in existing legislation relating to the conservation and use of biodiversity is the general lack of attention given to biodiversity outside of protected areas, and specifically to landscapes and ecosystems outside of protected areas. Where legislation does exist, it is often fragmented, poorly applied and enforced. The approach adopted by this policy is one which is holistic and integrated, requiring the adoption of legal measures to ensure the protection of identified species, ecosystems and habitat types outside of protected areas. This is considered fundamental to achieving the goals and objectives of this policy.

Sectoral policies

A major goal of this policy requires the conservation and sustainable use of biodiversity to be integrated into all sectoral and cross-sectoral plans, programmes and policies at all levels of government and in industry. The need for legislation to achieve this requires further consideration.

Access to genetic resources

There is an obvious policy vacuum with regard to controlling access to South Africa's indigenous genetic resources, and a clear need for legislation to establish national sovereignty over South Africa's biological resources, to guide the development of appropriate agreements, and to establish optimum conditions for benefit sharing.

Wild animals as a public and private resource

Wild animals are classified in South African common law as *res nullius*, that is as objects which are owned by nobody but which can be owned. Ownership is established by taking control of the animal with the intention of being the owner. In the past it was difficult to establish what degree of control was necessary to legally establish ownership, particularly in the case of large farms where wild animals tend to wander freely. Issues concerning the acquisition and loss of ownership of game are considered by the Game Theft Act (105 of 1991), which protect the rights of ownership of game where the game escapes or is lured away from the landowner's land. "Game" is classified in the Act as that which is kept for commercial or hunting purposes. However, not all wild animals fall into this category and thus the common law still applies to animals not classified as game.

Assigning private ownership for game has acted as an important incentive for conservation, and has resulted in many successful conservation initiatives in the country. There is, however, also a need to ensure that the public interest is safeguarded, and that private and public interests are fairly balanced. An issue to be resolved concerns that of compensation for damage caused by wildlife, and the liability for such damage.

4.3.4. Criteria and guidelines

In considering the amendment of existing or introduction of new legislation to meet the goals and objectives of this policy, Government will be guided by the following criteria and guidelines which require:

- legislation to emphasise the importance of the national government as the custodian of South Africa's biological diversity, and to adopt necessary measures to emphasise this role;
- uniform norms and standards to be established;
- legislation to be reasonable and easily implementable;
- effective conflict resolution mechanisms to be established to address conflict at all levels of governance;
- new legislation to complement existing legislation;
- socio-economic aspects of biodiversity (e.g. benefit sharing, compensation for local knowledge) to be a crucial component of legislation;
- legislation to recognise that those who conserve biodiversity should derive value from such actions;
- legislation to be used to implement the development of incentives and effective deterrents;
- legislation to be considered in conjunction with other tools;
- clarification to be given with regard to the roles and responsibilities of different agencies, and the problem of fragmentation of public institutions; and
- an integrated and holistic approach to be adopted which focuses predominantly upon the *in-situ* conservation and restoration of ecosystems and natural habitats, and the maintenance and recovery of viable populations of species in their natural surroundings.

4.3.5. National legislation

Stemming from these criteria and guidelines, as well as from the limitations and gaps of existing legislation identified above, the following actions will be undertaken by Government:

1. As part of the legislative and institutional audit that will be undertaken to implement the general national environmental policy, an investigation will also be performed of the efficacy of existing and proposed biodiversity-related legislation. This will consider legislation governing the conservation and use of biodiversity, as well as that regulating sectoral activities. It will also review South Africa's approaches to other international agreements of relevance to biodiversity, and ensure that such approaches are consistent with the policies articulated in this White Paper. Such an investigation will lead either to the development of new legislation or the amendment of existing legislation, and will indicate institutional changes required.
2. Following this audit, framework biodiversity legislation will be developed and implemented that is specific to achieving certain goals and objectives contained within this White Paper. It is envisaged that such legislation will rationalise and harmonise existing legislation, will articulate national norms and standards, and will embrace the holistic approach towards biodiversity that is presently absent in the law. Institutional arrangements for the effective realisation of the law will additionally be specified. The participation of both the national and provincial spheres of government will be ensured in this process so that the result is in keeping with the concurrent responsibilities held by these levels of government. This will further lead to the development or amendment of provincial legislation as appropriate.
3. The purpose of the framework legislation described would largely be to give effect to Goals 1 and 2 of this policy, concerning the conservation and sustainable use of biodiversity. There is, however, also a need to develop legislation to control access to South Africa's genetic resources. Given the absence of control measures, Government undertakes to develop such legislation as a matter of urgency.

4.4. Institutional Changes Required

4.4.1. Existing constraints

There are a number of major constraints hindering the effective implementation of this policy:

1. Inter-institutional fragmentation and conflicts of interest have resulted in strained intergovernmental relations concerning environmental matters. It is imperative to improve coordination and build understanding between institutions responsible for activities concerning the conservation and use of biodiversity.
2. The linking of conservation to other competencies such as tourism and agriculture has resulted in considerable competition in the allocation of funding. In addition, the establishment of new environmental departments in many of the provinces has resulted in a dwindling of the funds assigned for conservation, rather than new and additional funding being allocated from provincial and central government coffers.
3. There has been a perceptible drainage of essential expertise from government, as part of the rationalisation process. This has affected the ability of government to implement the provisions of this policy effectively.
4. The tendency of government departments to keep functions exclusive has thwarted efforts to integrate biodiversity and environmental considerations cross-sectorally.
5. There has been a lack of government capacity to monitor implementation and no structured mechanism to independently evaluate the performance of government and other sectors.
6. The Committee for Environmental Coordination (CEC), which is constituted under the Environment Conservation Act (No. 73 of 1989) to coordinate policy at the inter-institutional level, is widely considered to be weak and ineffectual. A major shortcoming of the Committee lies in the fact that it has little political recognition, and thus is not accorded importance by other departments. Additional concerns have been raised about the fact that the committee does not explicitly provide for non-governmental representation.
7. There is considerable confusion concerning the roles and responsibilities of different spheres of government in the context of the new Constitution.

4.4.2 Institutional structures

Not all of these constraints can be easily addressed, but all point towards a number of institutional deficiencies requiring:

- political will and commitment at the ministerial level;
- improved coordination, integration, and communication between and across the different levels of government;
- a structured mechanism, wherein input from non-governmental parties such as industry, NGOs, communities, holders of traditional knowledge, women, and the scientific community can be solicited to guide implementation;

- an independent mechanism to monitor and evaluate government's performance with regard to the implementation of this policy;
- clarification on the roles and responsibilities of the different spheres of government with regard to biodiversity management; and
- a strengthening of government's role and capacity in biodiversity management.

Guiding the development of models to address such deficiencies is the principle that wherever possible existing structures should be adapted or strengthened to undertake the required tasks, through the enhancement of existing capacity, the provision of adequate powers, and the allocation of sufficient budgets. In the interests of prudent administration, a proliferation of institutional structures should be guarded against, and new structures should be introduced only where appropriate and absolutely necessary.

4.5. Funding

The full and effective implementation of this policy will clearly not be possible without additional financial investments. Government will investigate possibilities for obtaining additional finances through: continued state funding, pursuing private sector funding, the introduction of incentives and disincentives, revenue generation, and attaining international and donor funding.

4.5.1. Government funding

Many of the actions required by this policy are already being financed and implemented by the Department of Environmental Affairs and Tourism, provincial departments of conservation and environment, and several other national, parastatal, and provincial agencies. Government will at the least maintain adequate funding levels and endeavour to increase funding in areas articulated by this policy that are not well addressed by present arrangements. To optimise the present use of funds, Government will institute performance audits of existing and future expenditures on biodiversity.

Attention will additionally be given to existing under-investments in biodiversity. In 1996, for example, only 0.28% (R532 million) of the national fiscus was allocated to biodiversity conservation (see Table IV, page 89). Clearly, these figures do not reflect the fundamental dependence of South Africa upon biodiversity, nor the investment required to ensure the continued economic well-being of South Africa and her people.

4.5.2. Private sector funding

The private sector have traditionally been a vital partner in assisting to finance biodiversity initiatives in South Africa. Government will support the continued and increased involvement of the private sector in funding aspects of the policy, and in assisting through social responsibility programmes. It will be crucial to ensure that funding arrangements, and the development of agreements with the private sector be transparent and open to public scrutiny.

4.5.3. Incentives, disincentives and revenue generation

Government is also aware of the need to pursue innovative approaches to ensure implementation of this policy. Attention will be given to investigating and developing creative ways in which new finances can be generated to support the objectives of this policy through, for example:

- the use of taxes, levies, and charges linked to activities directly using and/or affecting biodiversity;
- the generation of revenues from the sustainable development of biodiversity (*e.g.* tourism, animal and plant products);
- the establishment of a Biodiversity Trust Fund;
- royalties generated through biodiversity prospecting activities; and
- the introduction of conditions and incentives to strengthen the involvement of the private sector in the conservation and sustainable use of biodiversity.

The introduction of such measures will be coordinated and streamlined with other similar initiatives to ensure that Government adopts a uniform, and rational approach to the introduction of incentives and disincentives.

4.5.4. International and donor funding

Increasing efforts will be made to obtain international and donor funding for appropriate projects that can be implemented immediately but which can be managed sustainably. In addition, mechanisms will be established as a matter of priority to coordinate donor funding, and a forum established to liaise with donors.

Table IV. 1996 State Expenditure Allocated to Biodiversity Conservation

INSTITUTION	AMOUNT (RANDS)
CENTRAL GOVERNMENT	
Department of Environmental Affairs and Tourism (Directorate: Natural Environment)	5 107 000
Department of Environmental Affairs and Tourism (South African Nature Conservation Centre)	47 000
Department of Environmental Affairs and Tourism (South African Bird Conservation Unit)	114 000
Department of Environmental Affairs and Tourism (Habitat Council)	77 000
Department of Arts, Culture, Science and Technology (Zoological Gardens and Museums)	8 128 000
South African National Defence Force	4 030 622
STATUTORY BOARDS	
National Parks Board	46 209 000
National Botanical Institute	31 908 000
PROVINCIAL GOVERNMENT - NATURE CONSERVATION	
Eastern Cape	54 362 000
Northern Cape	14 283 000
Western Cape	41 884 000
Gauteng	22 227 000
North-West	38 490 000
Kwa-Zulu Natal	128 308 000
Northern Province	45 888 000
Free State	43 867 000
Mpumalanga	47 130 000
TOTAL	532 059 622

4.6. *Priority action*

All of the policy objectives articulated by this policy are important, but many are not immediately achievable, and others are dependent upon first putting in place the necessary building blocks and removing existing constraints.

A priority action of this policy will be to draft an action plan through which detailed implementation strategies can be developed. This action plan will form an essential component of the National Environmental Strategic Action Plan (NESAP).

In singling out those issues requiring urgent attention in the action plan, consideration will be given to (a) the needs expressed by the consultative process; (b) those actions likely to achieve the greatest impact with regard to stemming the loss of biodiversity; and (c) obligations of the Convention on Biological Diversity which South Africa has not yet met, and for which there is a pressing need.

These include:

1. Obtaining a political commitment from all relevant ministers and provincial MECs towards achieving the objectives of this policy. This will be in the form of approved sectoral plans and budgets for all relevant central government departments and provincial institutions;
2. Addressing concerns relating to the present degree of fragmentation amongst nature conservation agencies, and establishing the necessary institutional arrangements to accommodate such concerns and to ensure that effect is given to this policy;
3. The securing of necessary funding for implementation;
4. Strengthening and rationalising South Africa's protected area system;
5. Establishing legislative and administrative mechanisms to control access to South Africa's genetic resources;
6. Instituting a national biodiversity education and awareness plan; and
7. Actively participating in the development of a Biosafety Protocol, and instituting appropriate measures for biosafety, including the creation of sufficient capacity to manage risks and to undertake risk assessments.

Given the cross-sectoral and diffuse nature of many of these actions, it is not possible to provide an exact estimate of the costs involved in their implementation. What is clear, however, is that a substantial investment will be required to achieve this policy.

Can we afford implementation in the face of extremely pressing and sometimes conflicting development needs? Perhaps this question is best turned around, in light of our absolute dependence upon biodiversity for basic human needs, survival, and development: Can we afford *not* to act immediately? The answer, it seems, is plain. By addressing the agenda articulated in this policy it *is* possible, and it *must* be possible, for South Africa to achieve its vision of a nation which derives lasting development and environmental benefits from the conservation and sustainable use of its rich biological diversity.

Appendices

Appendix 1. *Reader's Guide to Terms Used in this Document*

<i>Alien organisms</i>	Plants, animals and microorganisms which do not naturally occur in an area, and which are deliberately or accidentally introduced by humans to ecosystems outside of their natural range.
<i>Biogeographic</i>	Concerning both geographical (<i>e.g.</i> climate, ocean currents), and biological (<i>e.g.</i> animals, plants) components and the inter-relationship of these components with humans.
<i>Biological Diversity or Biodiversity</i>	The variability among living organisms from all sources including, <i>inter alia</i> , terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.
<i>Biological Resources</i>	Includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential or value for humanity.
<i>Biome</i>	Any major ecological community of organisms, usually characterised by a dominant vegetation type.
<i>Biotechnology</i>	Any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use.
<i>Cell</i>	A cell is a small unit of living matter potentially capable of self-reproduction. Cells contain DNA, where information is stored, ribosomes, where proteins are made, and energy conversion mechanisms.
<i>Conservation</i>	The management of human use of the biosphere to yield the greatest benefit to present generations while maintaining the potential to meet the needs and aspirations of future generations. Conservation thus includes sustainable use, protection, maintenance, rehabilitation,

restoration, and enhancement of the natural environment

DNA

DNA is the abbreviation for deoxyribonucleic acid, a long chainlike molecule found in cells, storing all the information necessary for life.

Ecological Community

All the organisms that live in a given habitat and affect one another as part of the food web or through their various influences on the physical environment.

Ecosystem

A dynamic complex of plant, animal and microorganism communities and their non-living environment interacting as a functional unit.

Endemic

Any plant or animal species confined to or exclusive to a particular, specified area.

Enhancement

Increasing the capacity of an ecosystem or population to fulfil a particular function or yield a specified product.

Ex-Situ Conservation

The conservation of components of biodiversity off site, or outside their natural habitats.

Fynbos

Fynbos is the main vegetation type of the southwestern Cape and of the Cape Floristic Region.

Genes

Genes are small sections of DNA that contain hereditary information which can be passed from one generation to another.

Genetically Modified Organisms

Organisms whose genetic makeup has been altered by the insertion or removal of small fragments of DNA in order to create or enhance desirable characteristics.

Genetic Resources

The useful characteristics of plants, animals and microorganisms that are transmitted genetically.

Genebank

A collection point for the ex-situ conservation of seeds, tissues, or reproductive cells of plants or animals.

Genome

The total genetic complement of the cell(s) of organisms.

Germplasm

A term used to refer to the genetic information of an organism - the total genetic variability of a species.

<i>Habitat</i>	The place or type of site where an organism or population naturally occurs.
<i>In-Situ Conservation</i>	The conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.
<i>Indigenous</i>	Native to a particular area.
<i>Maintenance</i>	Keeping something in good health or repair.
<i>Population</i>	A group of individuals with common ancestry that are much more likely to mate with one another than with individuals from another such group.
<i>Preservation</i>	Keeping something in its present state.
<i>Prior Informed Consent</i>	Prior informed consent is consent to an activity that is given after receiving full disclosure regarding the reasons for the activity, the specific procedures the activity would entail, the potential risks involved, and the full implications that can realistically be foreseen.
<i>Protection</i>	See PRESERVATION.
<i>Protected area</i>	A geographically defined area designated and managed to achieve specific conservation objectives. Protected areas are dedicated primarily to the protection and enjoyment of natural or cultural heritage, to the maintenance of biodiversity, and to the maintenance of life-support systems.
<i>Red Data Books</i>	These provide information on the current status and conservation requirements of threatened species and ecosystems. This can be at a global or national level.
<i>Rehabilitation</i>	To return a degraded ecosystem or population to an undegraded condition and to productive use.
<i>Restoration</i>	To return a degraded ecosystem or population to its original condition.
<i>Species</i>	A group of plants, animals, microorganisms or other living organisms that are morphologically

similar; that share inheritance from common ancestry; or whose genes are so similar that they can breed together and produce fertile offspring.

Taxa

The named classification units to which individuals, or sets of species, are assigned.

Traditional Knowledge

Traditional knowledge of biodiversity refers to a body of knowledge built up by a group of people through generations of living in close contact with nature. Traditional knowledge of biodiversity is both cumulative and dynamic, building upon the experience of earlier generations and adapting to the new technological and socio-economic changes of the present.

Sustainable Use of Biological Resources

The use of components of biological diversity in a way and at a rate that does not lead to its long-term decline, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

Voucher Specimens

Vouchers are collections of organisms that are maintained to provide permanent, physical documentation of species identifications and associated data resulting from inventories.

Wildlife

Any non-domestic animals and plants which occur in the wild.

Appendix 2. *The Convention on Biological Diversity*

CONVENTION ON BIOLOGICAL DIVERSITY (1992)

PREAMBLE

The Contracting Parties,

Conscious of the intrinsic value of biological diversity and of the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components,

Conscious also of the importance of biological diversity for evolution and for maintaining life sustaining systems of the biosphere,

Affirming that the conservation of biological diversity is a common concern of humankind,

Reaffirming that States have sovereign rights over their own biological resources,

Reaffirming also that States are responsible for conserving their biological diversity and for using their biological resources in a sustainable manner,

Concerned that biological diversity is being significantly reduced by certain human activities,

Aware of the general lack of information and knowledge regarding biological diversity and of the urgent need to develop scientific, technical and institutional capacities to provide the basic understanding upon which to plan and implement appropriate measures,

Noting that it is vital to anticipate, prevent and attack the causes of significant reduction or loss of biological diversity at source,

Noting also that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat,

*Noting further that the fundamental requirement for the conservation of biological diversity is the *in-situ* conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings,*

*Noting further that *ex-situ* measures, preferably in the country of origin, also have an important role to play,*

Recognizing the close and traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological resources, and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of biological diversity and the sustainable use of its components,

Recognizing also the vital role that women play in the conservation and sustainable use of biological diversity and affirming the need for the full participation of women at all levels of policy-making and implementation for biological diversity conservation,

Stressing the importance of, and the need to promote, international, regional and global cooperation among States and intergovernmental organizations and the non-governmental sector for the conservation of biological diversity and the sustainable use of its components,

Acknowledging that the provision of new and additional financial resources and appropriate access to relevant technologies can be expected to make a substantial difference in the world's ability to address the loss of biological diversity,

Acknowledging further that special provision is required to meet the needs of developing countries, including the provision of new and additional financial resources and appropriate access to relevant technologies,

Noting in this regard the special conditions of the least developed countries and small island States,

Acknowledging that substantial investments are required to conserve biological diversity and that there is the expectation of a broad range of environmental, economic and social benefits from those investments,

Recognizing that economic and social development and poverty eradication are the first and overriding priorities of developing countries,

Aware that conservation and sustainable use of biological diversity is of critical importance for meeting the food, health and other needs of the growing world population, for which purpose access to and sharing of both genetic resources and technologies are essential,

Noting that, ultimately, the conservation and sustainable use of biological diversity will strengthen friendly relations among States and contribute to peace for humankind,

Desiring to enhance and complement existing international arrangements for the conservation of biological diversity and sustainable use of its components, and

Determined to conserve and sustainably use biological diversity for the benefit of present and future generations,

Have agreed as follows:

Article

1

OBJECTIVES

The objectives of this Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

Article
2
USE OF TERMS

For the purposes of this Convention:

"*Biological diversity*" means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

"*Biological resources*" includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity.

"*Biotechnology*" means any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use.

"*Country of origin of genetic resources*" means the country which possesses those genetic resources in *in-situ* conditions.

"*Country providing genetic resources*" means the country supplying genetic resources collected from *in-situ* sources, including populations of both wild and domesticated species, or taken from *ex-situ* sources, which may or may not have originated in that country.

"*Domesticated or cultivated species*" means species in which the evolutionary process has been influenced by humans to meet their needs.

"*Ecosystem*" means a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

"*Ex-situ conservation*" means the conservation of components of biological diversity outside their natural habitats.

"*Genetic material*" means any material of plant, animal, microbial or other origin containing functional units of heredity.

"*Genetic resources*" means genetic material of actual or potential value.

"*Habitat*" means the place or type of site where an organism or population naturally occurs.

"*In-situ conditions*" means conditions where genetic resources exist within ecosystems and natural habitats, and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

"*In-situ conservation*" means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

"*Protected area*" means a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives.

"*Regional economic integration organization*" means an organization constituted by sovereign States of a given region, to which its member States have transferred competence in respect of matters governed by this Convention and which has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve or accede to it.

"*Sustainable use*" means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

"*Technology*" includes biotechnology.

Article

3

PRINCIPLE

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

Article

4

JURISDICTIONAL SCOPE

Subject to the rights of other States, and except as otherwise expressly provided in this Convention, the provisions of this Convention apply, in relation to each Contracting Party:

- (a) In the case of components of biological diversity, in areas within the limits of its national jurisdiction; and
- (b) In the case of processes and activities, regardless of where their effects occur, carried out under its jurisdiction or control, within the area of its national jurisdiction or beyond the limits of national jurisdiction.

Article

5

COOPERATION

Each Contracting Party shall, as far as possible and as appropriate, cooperate with other Contracting Parties, directly or, where appropriate, through competent international organizations, in respect of areas beyond national jurisdiction and on other matters of mutual interest, for the conservation and sustainable use of biological diversity.

Article**6****GENERAL MEASURES FOR CONSERVATION AND
SUSTAINABLE USE**

Each Contracting Party shall, in accordance with its particular conditions and capabilities:

- (a) Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes which shall reflect, *inter alia*, the measures set out in this Convention relevant to the Contracting Party concerned; and
- (b) Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.

Article**7****IDENTIFICATION AND MONITORING**

Each Contracting Party shall, as far as possible and as appropriate, in particular for the purposes of Articles 8 to 10:

- (a) Identify components of biological diversity important for its conservation and sustainable use having regard to the indicative list of categories set down in Annex I;
- (b) Monitor, through sampling and other techniques, the components of biological diversity identified pursuant to subparagraph (a) above, paying particular attention to those requiring urgent conservation measures and those which offer the greatest potential for sustainable use;
- (c) Identify processes and categories of activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity, and monitor their effects through sampling and other techniques; and
- (d) Maintain and organize, by any mechanism data, derived from identification and monitoring activities pursuant to subparagraphs (a), (b) and (c) above.

Article**8****IN-SITU CONSERVATION**

Each Contracting Party shall, as far as possible and as appropriate:

- (a) Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity;

- (b) Develop, where necessary, guidelines for the selection, establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity;
- (c) Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use;
- (d) Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;
- (e) Promote environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering protection of these areas;
- (f) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, *inter alia*, through the development and implementation of plans or other management strategies;
- (g) Establish or maintain means to regulate, manage or control the risks associated with the use and release of living modified organisms resulting from biotechnology which are likely to have adverse environmental impacts that could affect the conservation and sustainable use of biological diversity, taking also into account the risks to human health;
- (h) Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species;
- (i) Endeavour to provide the conditions needed for compatibility between present uses and the conservation of biological diversity and the sustainable use of its components;
- (j) Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices;
- (k) Develop or maintain necessary legislation and/or other regulatory provisions for the protection of threatened species and populations;
- (l) Where a significant adverse effect on biological diversity has been determined pursuant to Article 7, regulate or manage the relevant processes and categories of activities; and
- (m) Cooperate in providing financial and other support for in-situ conservation outlined in subparagraphs (a) to (l) above, particularly to developing countries.

Article**9****EX-SITU CONSERVATION**

Each Contracting Party shall, as far as possible and as appropriate, and predominantly for the purpose of complementing in-situ measures:

- (a) Adopt measures for the ex-situ conservation of components of biological diversity, preferably in the country of origin of such components;
- (b) Establish and maintain facilities for ex-situ conservation of and research on plants, animals and micro-organisms, preferably in the country of origin of genetic resources;
- (c) Adopt measures for the recovery and rehabilitation of threatened species and for their reintroduction into their natural habitats under appropriate conditions;
- (d) Regulate and manage collection of biological resources from natural habitats for *ex-situ* conservation purposes so as not to threaten ecosystems and *in-situ* populations of species, except where special temporary *ex-situ* measures are required under subparagraph (c) above; and
- (e) Cooperate in providing financial and other support for *ex-situ* conservation outlined in subparagraphs (a) to (d) above and in the establishment and maintenance of *ex-situ* conservation facilities in developing countries.

Article**10****SUSTAINABLE USE OF COMPONENTS OF BIOLOGICAL DIVERSITY**

Each Contracting Party shall, as far as possible and as appropriate:

- (a) Integrate consideration of the conservation and sustainable use of biological resources into national decision-making;
- (b) Adopt measures relating to the use of biological resources to avoid or minimize adverse impacts on biological diversity;
- (c) Protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements;
- (d) Support local populations to develop and implement remedial action in degraded areas where biological diversity has been reduced; and
- (e) Encourage cooperation between its governmental authorities and its private sector in developing methods for sustainable use of biological resources.

Article**11****INCENTIVE MEASURES**

Each Contracting Party shall, as far as possible and as appropriate, adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity.

Article**12****RESEARCH AND TRAINING**

The Contracting Parties, taking into account the special needs of developing countries, shall:

- (a) Establish and maintain programmes for scientific and technical education and training in measures for the identification, conservation and sustainable use of biological diversity and its components and provide support for such education and training for the specific needs of developing countries;
- (b) Promote and encourage research which contributes to the conservation and sustainable use of biological diversity, particularly in developing countries, *inter alia*, in accordance with decisions of the Conference of the Parties taken in consequence of recommendations of the Subsidiary Body on Scientific, Technical and Technological Advice; and
- (c) In keeping with the provisions of Articles 16, 18 and 20, promote and cooperate in the use of scientific advances in biological diversity research in developing methods for conservation and sustainable use of biological resources.

Article**13****PUBLIC EDUCATION AND AWARENESS**

The Contracting Parties shall:

- (a) Promote and encourage understanding of the importance of, and the measures required for, the conservation of biological diversity, as well as its propagation through media, and the inclusion of these topics in educational programmes; and
- (b) Cooperate, as appropriate, with other States and international organizations in developing educational and public awareness programmes, with respect to conservation and sustainable use of biological diversity.

Article**14****IMPACT ASSESSMENT AND MINIMIZING ADVERSE IMPACTS**

1. Each Contracting Party, as far as possible and as appropriate, shall:
 - (a) Introduce appropriate procedures requiring environmental impact assessment of its proposed projects that are likely to have significant adverse effects on biological diversity with a view to avoiding or minimizing such effects and, where appropriate, allow for public participation in such procedures;
 - (b) Introduce appropriate arrangements to ensure that the environmental consequences of its programmes and policies that are likely to have significant adverse impacts on biological diversity are duly taken into account;
 - (c) Promote, on the basis of reciprocity, notification, exchange of information and consultation on activities under their jurisdiction or control which are likely to significantly affect adversely the biological diversity of other States or areas beyond the limits of national jurisdiction, by encouraging the conclusion of bilateral, regional or multilateral arrangements, as appropriate;
 - (d) In the case of imminent or grave danger or damage, originating under its jurisdiction or control, to biological diversity within the area under jurisdiction of other States or in areas beyond the limits of national jurisdiction, notify immediately the potentially affected States of such danger or damage, as well as initiate action to prevent or minimize such danger or damage; and
 - (e) Promote national arrangements for emergency responses to activities or events, whether caused naturally or otherwise, which present a grave and imminent danger to biological diversity and encourage international cooperation to supplement such national efforts and, where appropriate and agreed by the States or regional economic integration organizations concerned, to establish joint contingency plans.
2. The Conference of the Parties shall examine, on the basis of studies to be carried out, the issue of liability and redress, including restoration and compensation, for damage to biological diversity, except where such liability is a purely internal matter.

Article**15****ACCESS TO GENETIC RESOURCES**

1. Recognizing the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation.
2. Each Contracting Party shall endeavour to create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties and not to impose restrictions that run counter to the objectives of this Convention.

3. For the purpose of this Convention, the genetic resources being provided by a Contracting Party, as referred to in this Article and Articles 16 and 19, are only those that are provided by Contracting Parties that are countries of origin of such resources or by the Parties that have acquired the genetic resources in accordance with this Convention.
4. Access, where granted, shall be on mutually agreed terms and subject to the provisions of this Article.
5. Access to genetic resources shall be subject to prior informed consent of the Contracting Party providing such resources, unless otherwise determined by that Party.
6. Each Contracting Party shall endeavour to develop and carry out scientific research based on genetic resources provided by other Contracting Parties with the full participation of, and where possible in, such Contracting Parties.
7. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, and in accordance with Articles 16 and 19 and, where necessary, through the financial mechanism established by Articles 20 and 21 with the aim of sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources. Such sharing shall be upon mutually agreed terms.

Article

16

ACCESS TO AND TRANSFER OF TECHNOLOGY

1. Each Contracting Party, recognizing that technology includes biotechnology, and that both access to and transfer of technology among Contracting Parties are essential elements for the attainment of the objectives of this Convention, undertakes subject to the provisions of this Article to provide and/or facilitate access for and transfer to other Contracting Parties of technologies that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources and do not cause significant damage to the environment.
2. Access to and transfer of technology referred to in paragraph 1 above to developing countries shall be provided and/or facilitated under fair and most favourable terms, including on concessional and preferential terms where mutually agreed, and, where necessary, in accordance with the financial mechanism established by Articles 20 and 21. In the case of technology subject to patents and other intellectual property rights, such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights. The application of this paragraph shall be consistent with paragraphs 3, 4 and 5 below.
3. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, with the aim that Contracting Parties, in particular those that are developing countries, which provide genetic resources are provided access to and transfer of technology which makes use of those resources, on mutually agreed terms, including technology protected by patents and other intellectual property rights, where necessary, through the provisions of Articles 20 and 21 and in accordance with international law and consistent with paragraphs 4 and 5 below.

4. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, with the aim that the private sector facilitates access to, joint development and transfer of technology referred to in paragraph 1 above for the benefit of both governmental institutions and the private sector of developing countries and in this regard shall abide by the obligations included in paragraphs 1, 2 and 3 above.

5. The Contracting Parties, recognizing that patents and other intellectual property rights may have an influence on the implementation of this Convention, shall cooperate in this regard subject to national legislation and international law in order to ensure that such rights are supportive of and do not run counter to its objectives.

Article

17

EXCHANGE OF INFORMATION

1. The Contracting Parties shall facilitate the exchange of information, from all publicly available sources, relevant to the conservation and sustainable use of biological diversity, taking into account the special needs of developing countries.

2. Such exchange of information shall include exchange of results of technical, scientific and socio-economic research, as well as information on training and surveying programmes, specialized knowledge, indigenous and traditional knowledge as such and in combination with the technologies referred to in Article 16, paragraph 1. It shall also, where feasible, include repatriation of information.

Article

18

TECHNICAL AND SCIENTIFIC COOPERATION

1. The Contracting Parties shall promote international technical and scientific cooperation in the field of conservation and sustainable use of biological diversity, where necessary, through the appropriate international and national institutions.

2. Each Contracting Party shall promote technical and scientific cooperation with other Contracting Parties, in particular developing countries, in implementing this Convention, *inter alia*, through the development and implementation of national policies. In promoting such cooperation, special attention should be given to the development and strengthening of national capabilities, by means of human resources development and institution building.

3. The Conference of the Parties, at its first meeting, shall determine how to establish a clearing-house mechanism to promote and facilitate technical and scientific cooperation.

4. The Contracting Parties shall, in accordance with national legislation and policies, encourage and develop methods of cooperation for the development and use of technologies, including indigenous and traditional technologies, in pursuance of the objectives of this Convention. For this purpose, the Contracting Parties shall also promote cooperation in the training of personnel and exchange of experts.

5. The Contracting Parties shall, subject to mutual agreement, promote the establishment of joint research programmes and joint ventures for the development of technologies relevant to the objectives of this Convention.

Article

19

HANDLING OF BIOTECHNOLOGY AND DISTRIBUTION OF ITS BENEFITS

1. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, to provide for the effective participation in biotechnological research activities by those Contracting Parties, especially developing countries, which provide the genetic resources for such research, and where feasible in such Contracting Parties.
2. Each Contracting Party shall take all practicable measures to promote and advance priority access on a fair and equitable basis by Contracting Parties, especially developing countries, to the results and benefits arising from biotechnologies based upon genetic resources provided by those Contracting Parties. Such access shall be on mutually agreed terms.
3. The Parties shall consider the need for and modalities of a protocol setting out appropriate procedures, including, in particular, advance informed agreement, in the field of the safe transfer, handling and use of any living modified organism resulting from biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity.
4. Each Contracting Party shall, directly or by requiring any natural or legal person under its jurisdiction providing the organisms referred to in paragraph 3 above, provide any available information about the use and safety regulations required by that Contracting Party in handling such organisms, as well as any available information on the potential adverse impact of the specific organisms concerned to the Contracting Party into which those organisms are to be introduced.

Article

20

FINANCIAL RESOURCES

1. Each Contracting Party undertakes to provide, in accordance with its capabilities, financial support and incentives in respect of those national activities which are intended to achieve the objectives of this Convention, in accordance with its national plans, priorities and programmes.
2. The developed country Parties shall provide new and additional financial resources to enable developing country Parties to meet the agreed full incremental costs to them of implementing measures which fulfil the obligations of this Convention and to benefit from its provisions and which costs are agreed between a developing country Party and the institutional structure referred to in Article 21, in accordance with policy, strategy, programme priorities and eligibility criteria and an indicative list of incremental costs established by the Conference of the Parties. Other Parties, including countries undergoing the process of transition to a market economy, may voluntarily assume the obligations of the developed country Parties. For the

purpose of this Article, the Conference of the Parties, shall at its first meeting establish a list of developed country Parties and other Parties which voluntarily assume the obligations of the developed country Parties. The Conference of the Parties shall periodically review and if necessary amend the list. Contributions from other countries and sources on a voluntary basis would also be encouraged. The implementation of these commitments shall take into account the need for adequacy, predictability and timely flow of funds and the importance of burden-sharing among the contributing Parties included in the list.

3. The developed country Parties may also provide, and developing country Parties avail themselves of, financial resources related to the implementation of this Convention through bilateral, regional and other multilateral channels.

4. The extent to which developing country Parties will effectively implement their commitments under this Convention will depend on the effective implementation by developed country Parties of their commitments under this Convention related to financial resources and transfer of technology and will take fully into account the fact that economic and social development and eradication of poverty are the first and overriding priorities of the developing country Parties.

5. The Parties shall take full account of the specific needs and special situation of least developed countries in their actions with regard to funding and transfer of technology.

6. The Contracting Parties shall also take into consideration the special conditions resulting from the dependence on, distribution and location of, biological diversity within developing country Parties, in particular small island States.

7. Consideration shall also be given to the special situation of developing countries, including those that are most environmentally vulnerable, such as those with arid and semi-arid zones, coastal and mountainous areas.

Article

21

FINANCIAL MECHANISM

1. There shall be a mechanism for the provision of financial resources to developing country Parties for purposes of this Convention on a grant or concessional basis the essential elements of which are described in this Article. The mechanism shall function under the authority and guidance of, and be accountable to, the Conference of the Parties for purposes of this Convention. The operations of the mechanism shall be carried out by such institutional structure as may be decided upon by the Conference of the Parties at its first meeting. For purposes of this Convention, the Conference of the Parties shall determine the policy, strategy, programme priorities and eligibility criteria relating to the access to and utilization of such resources. The contributions shall be such as to take into account the need for predictability, adequacy and timely flow of funds referred to in Article 20 in accordance with the amount of resources needed to be decided periodically by the Conference of the Parties and the importance of burden-sharing among the contributing Parties included in the list referred to in Article 20, paragraph 2. Voluntary contributions may also be made by the developed country Parties and by other countries and sources. The mechanism shall operate within a democratic and transparent system of governance.

2. Pursuant to the objectives of this Convention, the Conference of the Parties shall at its first meeting determine the policy, strategy and programme priorities, as well as detailed criteria and guidelines for eligibility for access to and utilization of the financial resources including monitoring and evaluation on a regular basis of such utilization. The Conference of the Parties shall decide on the arrangements to give effect to paragraph 1 above after consultation with the institutional structure entrusted with the operation of the financial mechanism.

3. The Conference of the Parties shall review the effectiveness of the mechanism established under this Article, including the criteria and guidelines referred to in paragraph 2 above, not less than two years after the entry into force of this Convention and thereafter on a regular basis. Based on such review, it shall take appropriate action to improve the effectiveness of the mechanism if necessary.

4. The Contracting Parties shall consider strengthening existing financial institutions to provide financial resources for the conservation and sustainable use of biological diversity.

Article

22

RELATIONSHIP WITH OTHER INTERNATIONAL CONVENTIONS

1. The provisions of this Convention shall not affect the rights and obligations of any Contracting Party deriving from any existing international agreement, except where the exercise of those rights and obligations would cause a serious damage or threat to biological diversity.

2. Contracting Parties shall implement this Convention with respect to the marine environment consistently with the rights and obligations of States under the law of the sea.

Article

23

CONFERENCE OF THE PARTIES

1. A Conference of the Parties is hereby established. The first meeting of the Conference of the Parties shall be convened by the Executive Director of the United Nations Environment Programme not later than one year after the entry into force of this Convention. Thereafter, ordinary meetings of the Conference of the Parties shall be held at regular intervals to be determined by the Conference at its first meeting.

2. Extraordinary meetings of the Conference of the Parties shall be held at such other times as may be deemed necessary by the Conference, or at the written request of any Party, provided that, within six months of the request being communicated to them by the Secretariat, it is supported by at least one third of the Parties.

3. The Conference of the Parties shall by consensus agree upon and adopt rules of procedure for itself and for any subsidiary body it may establish, as well as financial rules governing the funding of the Secretariat. At each ordinary meeting, it shall adopt a budget for the financial period until the next ordinary meeting.

4. The Conference of the Parties shall keep under review the implementation of this Convention, and, for this purpose, shall:
- (a) Establish the form and the intervals for transmitting the information to be submitted in accordance with Article 26 and consider such information as well as reports submitted by any subsidiary body;
 - (b) Review scientific, technical and technological advice on biological diversity provided in accordance with Article 25;
 - (c) Consider and adopt, as required, protocols in accordance with Article 28;
 - (d) Consider and adopt, as required, in accordance with Articles 29 and 30, amendments to this Convention and its annexes;
 - (e) Consider amendments to any protocol, as well as to any annexes thereto, and, if so decided, recommend their adoption to the parties to the protocol concerned;
 - (f) Consider and adopt, as required, in accordance with Article 30, additional annexes to this Convention;
 - (g) Establish such subsidiary bodies, particularly to provide scientific and technical advice, as are deemed necessary for the implementation of this Convention;
 - (h) Contact, through the Secretariat, the executive bodies of conventions dealing with matters covered by this Convention with a view to establishing appropriate forms of cooperation with them; and
 - (i) Consider and undertake any additional action that may be required for the achievement of the purposes of this Convention in the light of experience gained in its operation.
5. The United Nations, its specialized agencies and the International Atomic Energy Agency, as well as any State not Party to this Convention, may be represented as observers at meetings of the Conference of the Parties. Any other body or agency, whether governmental or non-governmental, qualified in fields relating to conservation and sustainable use of biological diversity, which has informed the Secretariat of its wish to be represented as an observer at a meeting of the Conference of the Parties, may be admitted unless at least one third of the Parties present object. The admission and participation of observers shall be subject to the rules of procedure adopted by the Conference of the Parties.

Article
24
SECRETARIAT

1. A secretariat is hereby established. Its functions shall be:
- (a) To arrange for and service meetings of the Conference of the Parties provided for in Article 23;

- (b) To perform the functions assigned to it by any protocol;
 - (c) To prepare reports on the execution of its functions under this Convention and present them to the Conference of the Parties;
 - (d) To coordinate with other relevant international bodies and, in particular to enter into such administrative and contractual arrangements as may be required for the effective discharge of its functions; and
 - (e) To perform such other functions as may be determined by the Conference of the Parties.
2. At its first ordinary meeting, the Conference of the Parties shall designate the secretariat from amongst those existing competent international organizations which have signified their willingness to carry out the secretariat functions under this Convention.

Article

25

SUBSIDIARY BODY ON SCIENTIFIC, TECHNICAL AND TECHNOLOGICAL ADVICE

1. A subsidiary body for the provision of scientific, technical and technological advice is hereby established to provide the Conference of the Parties and, as appropriate, its other subsidiary bodies with timely advice relating to the implementation of this Convention. This body shall be open to participation by all Parties and shall be multidisciplinary. It shall comprise government representatives competent in the relevant field of expertise. It shall report regularly to the Conference of the Parties on all aspects of its work.
2. Under the authority of and in accordance with guidelines laid down by the Conference of the Parties, and upon its request, this body shall:
- (a) Provide scientific and technical assessments of the status of biological diversity;
 - (b) Prepare scientific and technical assessments of the effects of types of measures taken in accordance with the provisions of this Convention;
 - (c) Identify innovative, efficient and state-of-the-art technologies and know-how relating to the conservation and sustainable use of biological diversity and advise on the ways and means of promoting development and/or transferring such technologies;
 - (d) Provide advice on scientific programmes and international cooperation in research and development related to conservation and sustainable use of biological diversity; and
 - (e) Respond to scientific, technical, technological and methodological questions that the Conference of the Parties and its subsidiary bodies may put to the body.
3. The functions, terms of reference, organization and operation of this body may be further elaborated by the Conference of the Parties.

Article
26
REPORTS

Each Contracting Party shall, at intervals to be determined by the Conference of the Parties, present to the Conference of the Parties, reports on measures which it has taken for the implementation of the provisions of this Convention and their effectiveness in meeting the objectives of this Convention.

Article
27
SETTLEMENT OF DISPUTES

1. In the event of a dispute between Contracting Parties concerning the interpretation or application of this Convention, the parties concerned shall seek solution by negotiation.
2. If the parties concerned cannot reach agreement by negotiation, they may jointly seek the good offices of, or request mediation by, a third party.
3. When ratifying, accepting, approving or acceding to this Convention, or at any time thereafter, a State or regional economic integration organization may declare in writing to the Depository that for a dispute not resolved in accordance with paragraph 1 or paragraph 2 above, it accepts one or both of the following means of dispute settlement as compulsory:
 - (a) Arbitration in accordance with the procedure laid down in Part 1 of Annex II;
 - (b) Submission of the dispute to the International Court of Justice.
4. If the parties to the dispute have not, in accordance with paragraph 3 above, accepted the same or any procedure, the dispute shall be submitted to conciliation in accordance with Part 2 of Annex II unless the parties otherwise agree.
5. The provisions of this Article shall apply with respect to any protocol except as otherwise provided in the protocol concerned.

Article
28
ADOPTION OF PROTOCOLS

1. The Contracting Parties shall cooperate in the formulation and adoption of protocols to this Convention.
2. Protocols shall be adopted at a meeting of the Conference of the Parties.
3. The text of any proposed protocol shall be communicated to the Contracting Parties by the Secretariat at least six months before such a meeting.

Article**29****AMENDMENT OF THE CONVENTION OR PROTOCOLS**

1. Amendments to this Convention may be proposed by any Contracting Party. Amendments to any protocol may be proposed by any Party to that protocol.
2. Amendments to this Convention shall be adopted at a meeting of the Conference of the Parties. Amendments to any protocol shall be adopted at a meeting of the Parties to the Protocol in question. The text of any proposed amendment to this Convention or to any protocol, except as may otherwise be provided in such protocol, shall be communicated to the Parties to the instrument in question by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate proposed amendments to the signatories to this Convention for information.
3. The Parties shall make every effort to reach agreement on any proposed amendment to this Convention or to any protocol by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the amendment shall as a last resort be adopted by a two-third majority vote of the Parties to the instrument in question present and voting at the meeting, and shall be submitted by the Depositary to all Parties for ratification, acceptance or approval.
4. Ratification, acceptance or approval of amendments shall be notified to the Depositary in writing. Amendments adopted in accordance with paragraph 3 above shall enter into force among Parties having accepted them on the ninetieth day after the deposit of instruments of ratification, acceptance or approval by at least two thirds of the Contracting Parties to this Convention or of the Parties to the protocol concerned, except as may otherwise be provided in such protocol. Thereafter the amendments shall enter into force for any other Party on the ninetieth day after that Party deposits its instrument of ratification, acceptance or approval of the amendments.
5. For the purposes of this Article, "Parties present and voting" means Parties present and casting an affirmative or negative vote.

Article**30****ADOPTION AND AMENDMENT OF ANNEXES**

1. The annexes to this Convention or to any protocol shall form an integral part of the Convention or of such protocol, as the case may be, and, unless expressly provided otherwise, a reference to this Convention or its protocols constitutes at the same time a reference to any annexes thereto. Such annexes shall be restricted to procedural, scientific, technical and administrative matters.
2. Except as may be otherwise provided in any protocol with respect to its annexes, the following procedure shall apply to the proposal, adoption and entry into force of additional annexes to this Convention or of annexes to any protocol:

- (a) Annexes to this Convention or to any protocol shall be proposed and adopted according to the procedure laid down in Article 29;
- (b) Any Party that is unable to approve an additional annex to this Convention or an annex to any protocol to which it is Party shall so notify the Depositary, in writing, within one year from the date of the communication of the adoption by the Depositary. The Depositary shall without delay notify all Parties of any such notification received. A Party may at any time withdraw a previous declaration of objection and the annexes shall thereupon enter into force for that Party subject to subparagraph (c) below;
- (c) On the expiry of one year from the date of the communication of the adoption by the Depositary, the annex shall enter into force for all Parties to this Convention or to any protocol concerned which have not submitted a notification in accordance with the provisions of subparagraph (b) above.
3. The proposal, adoption and entry into force of amendments to annexes to this Convention or to any protocol shall be subject to the same procedure as for the proposal, adoption and entry into force of annexes to the Convention or annexes to any protocol.
4. If an additional annex or an amendment to an annex is related to an amendment to this Convention or to any protocol, the additional annex or amendment shall not enter into force until such time as the amendment to the Convention or to the protocol concerned enters into force.

Article

31

RIGHT TO VOTE

1. Except as provided for in paragraph 2 below, each Contracting Party to this Convention or to any protocol shall have one vote.
2. Regional economic integration organizations, in matters within their competence, shall exercise their right to vote with a number of votes equal to the number of their member States which are Contracting Parties to this Convention or the relevant protocol. Such organizations shall not exercise their right to vote if their member States exercise theirs, and vice versa.

Article

32

RELATIONSHIP BETWEEN THIS CONVENTION AND ITS PROTOCOLS

1. A State or a regional economic integration organization may not become a Party to a protocol unless it is, or becomes at the same time, a Contracting Party to this Convention.
2. Decisions under any protocol shall be taken only by the Parties to the protocol concerned. Any Contracting Party that has not ratified, accepted or approved a protocol may participate as an observer in any meeting of the parties to that protocol.

Article
33
SIGNATURE

This Convention shall be open for signature at Rio de Janeiro by all States and any regional economic integration organization from 5 June 1992 until 14 June 1992, and at the United Nations Headquarters in New York from 15 June 1992 to 4 June 1993.

Article
34
RATIFICATION, ACCEPTANCE OR APPROVAL

1. This Convention and any protocol shall be subject to ratification, acceptance or approval by States and by regional economic integration organizations. Instruments of ratification, acceptance or approval shall be deposited with the Depositary.
2. Any organization referred to in paragraph 1 above which becomes a Contracting Party to this Convention or any protocol without any of its member States being a Contracting Party shall be bound by all the obligations under the Convention or the protocol, as the case may be. In the case of such organizations, one or more of whose member States is a Contracting Party to this Convention or relevant protocol, the organization and its member States shall decide on their respective responsibilities for the performance of their obligations under the Convention or protocol, as the case may be. In such cases, the organization and the member States shall not be entitled to exercise rights under the Convention or relevant protocol concurrently.
3. In their instruments of ratification, acceptance or approval, the organizations referred to in paragraph 1 above shall declare the extent of their competence with respect to the matters governed by the Convention or the relevant protocol. These organizations shall also inform the Depositary of any relevant modification in the extent of their competence.

Article
35
ACCESSION

1. This Convention and any protocol shall be open for accession by States and by regional economic integration organizations from the date on which the Convention or the protocol concerned is closed for signature. The instruments of accession shall be deposited with the Depositary.
2. In their instruments of accession, the organizations referred to in paragraph 1 above shall declare the extent of their competence with respect to the matters governed by the Convention or the relevant protocol. These organizations shall also inform the Depositary of any relevant modification in the extent of their competence.
3. The provisions of Article 34, paragraph 2, shall apply to regional economic integration organizations which accede to this Convention or any protocol.

Article**36****ENTRY INTO FORCE**

1. This Convention shall enter into force on the ninetieth day after the date of deposit of the thirtieth instrument of ratification, acceptance, approval or accession.
2. Any protocol shall enter into force on the ninetieth day after the date of deposit of the number of instruments of ratification, acceptance, approval or accession, specified in that protocol, has been deposited.
3. For each Contracting Party which ratifies, accepts or approves this Convention or accedes thereto after the deposit of the thirtieth instrument of ratification, acceptance, approval or accession, it shall enter into force on the ninetieth day after the date of deposit by such Contracting Party of its instrument of ratification, acceptance, approval or accession.
4. Any protocol, except as otherwise provided in such protocol, shall enter into force for a Contracting Party that ratifies, accepts or approves that protocol or accedes thereto after its entry into force pursuant to paragraph 2 above, on the ninetieth day after the date on which that Contracting Party deposits its instrument of ratification, acceptance, approval or accession, or on the date on which this Convention enters into force for that Contracting Party, whichever shall be the later.
5. For the purposes of paragraphs 1 and 2 above, any instrument deposited by a regional economic integration organization shall not be counted as additional to those deposited by member States of such organization.

Article**37****RESERVATIONS**

No reservations may be made to this Convention.

Article**38****WITHDRAWALS**

1. At any time after two years from the date on which this Convention has entered into force for a Contracting Party, that Contracting Party may withdraw from the Convention by giving written notification to the Depositary.
2. Any such withdrawal shall take place upon expiry of one year after the date of its receipt by the Depositary, or on such later date as may be specified in the notification of the withdrawal.
3. Any Contracting Party which withdraws from this Convention shall be considered as also having withdrawn from any protocol to which it is party.

Article**39****FINANCIAL INTERIM ARRANGEMENTS**

Provided that it has been fully restructured in accordance with the requirements of Article 21, the Global Environment Facility of the United Nations Development Programme, the United Nations Environment Programme and the International Bank for Reconstruction and Development shall be the institutional structure referred to in Article 21 on an interim basis, for the period between the entry into force of this Convention and the first meeting of the Conference of the Parties or until the Conference of the Parties decides which institutional structure will be designated in accordance with Article 21.

Article**40****SECRETARIAT INTERIM ARRANGEMENTS**

The secretariat to be provided by the Executive Director of the United Nations Environment Programme shall be the secretariat referred to in Article 24, paragraph 2, on an interim basis for the period between the entry into force of this Convention and the first meeting of the Conference of the Parties.

Article**41****DEPOSITARY**

The Secretary-General of the United Nations shall assume the functions of Depositary of this Convention and any protocols.

Article**42****AUTHENTIC TEXTS**

The original of this Convention, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations.

IN WITNESS WHEREOF the undersigned, being duly authorized to that effect, have signed this Convention.

Done at Rio de Janeiro on this fifth day of June, one thousand nine hundred and ninety- two.

ANNEX I

IDENTIFICATION AND MONITORING

1. Ecosystems and habitats: containing high diversity, large numbers of endemic or threatened species, or wilderness; required by migratory species; of social, economic, cultural or scientific importance; or, which are representative, unique or associated with key evolutionary or other biological processes;
2. Species and communities which are: threatened; wild relatives of domesticated or cultivated species; of medicinal, agricultural or other economic value; or social, scientific or cultural importance; or importance for research into the conservation and sustainable use of biological diversity, such as indicator species; and
3. Described genomes and genes of social, scientific or economic importance.

Annex II

Part 1

ARBITRATION

Article 1

The claimant party shall notify the secretariat that the parties are referring a dispute to arbitration pursuant to Article 27. The notification shall state the subject-matter of arbitration and include, in particular, the articles of the Convention or the protocol, the interpretation or application of which are at issue. If the parties do not agree on the subject matter of the dispute before the President of the tribunal is designated, the arbitral tribunal shall determine the subject matter. The secretariat shall forward the information thus received to all Contracting Parties to this Convention or to the protocol concerned.

Article 2

1. In disputes between two parties, the arbitral tribunal shall consist of three members. Each of the parties to the dispute shall appoint an arbitrator and the two arbitrators so appointed shall designate by common agreement the third arbitrator who shall be the President of the tribunal. The latter shall not be a national of one of the parties to the dispute, nor have his or her usual place of residence in the territory of one of these parties, nor be employed by any of them, nor have dealt with the case in any other capacity.
2. In disputes between more than two parties, parties in the same interest shall appoint one arbitrator jointly by agreement.
3. Any vacancy shall be filled in the manner prescribed for the initial appointment.

Article 3

1. If the President of the arbitral tribunal has not been designated within two months of the appointment of the second arbitrator, the Secretary-General of the United Nations shall, at the request of a party, designate the President within a further two-month period.
2. If one of the parties to the dispute does not appoint an arbitrator within two months of receipt of the request, the other party may inform the Secretary-General who shall make the designation within a further two-month period.

Article 4

The arbitral tribunal shall render its decisions in accordance with the provisions of this Convention, any protocols concerned, and international law.

Article 5

Unless the parties to the dispute otherwise agree, the arbitral tribunal shall determine its own rules of procedure.

Article 6

The arbitral tribunal may, at the request of one of the parties, recommend essential interim measures of protection.

Article 7

The parties to the dispute shall facilitate the work of the arbitral tribunal and, in particular, using all means at their disposal, shall:

- (a) Provide it with all relevant documents, information and facilities; and
- (b) Enable it, when necessary, to call witnesses or experts and receive their evidence.

Article 8

The parties and the arbitrators are under an obligation to protect the confidentiality of any information they receive in confidence during the proceedings of the arbitral tribunal.

Article 9

Unless the arbitral tribunal determines otherwise because of the particular circumstances of the case, the costs of the tribunal shall be borne by the parties to the dispute in equal shares. The tribunal shall keep a record of all its costs, and shall furnish a final statement thereof to the parties.

Article 10

Any Contracting Party that has an interest of a legal nature in the subject-matter of the dispute which may be affected by the decision in the case, may intervene in the proceedings with the consent of the tribunal.

Article 11

The tribunal may hear and determine counterclaims arising directly out of the subject-matter of the dispute.

Article 12

Decisions both on procedure and substance of the arbitral tribunal shall be taken by a majority vote of its members.

Article 13

If one of the parties to the dispute does not appear before the arbitral tribunal or fails to defend its case, the other party may request the tribunal to continue the proceedings and to make its award. Absence of a party or a failure of a party to defend its case shall not constitute a bar to the proceedings. Before rendering its final decision, the arbitral tribunal must satisfy itself that the claim is well founded in fact and law.

Article 14

The tribunal shall render its final decision within five months of the date on which it is fully constituted unless it finds it necessary to extend the time-limit for a period which should not exceed five more months.

Article 15

The final decision of the arbitral tribunal shall be confined to the subject-matter of the dispute and shall state the reasons on which it is based. It shall contain the names of the members who have participated and the date of the final decision. Any member of the tribunal may attach a separate or dissenting opinion to the final decision.

Article 16

The award shall be binding on the parties to the dispute. It shall be without appeal unless the parties to the dispute have agreed in advance to an appellate procedure.

Article 17

Any controversy which may arise between the parties to the dispute as regards the interpretation or manner of implementation of the final decision may be submitted by either party for decision to the arbitral tribunal which rendered it.

Part 2**CONCILIATION****Article 1**

A conciliation commission shall be created upon the request of one of the parties to the dispute. The commission shall, unless the parties otherwise agree, be composed of five members, two appointed by each Party concerned and a President chosen jointly by those members.

Article 2

In disputes between more than two parties, parties in the same interest shall appoint their members of the commission jointly by agreement. Where two or more parties have separate interests or there is a disagreement as to whether they are of the same interest, they shall appoint their members separately.

Article 3

If any appointments by the parties are not made within two months of the date of the request to create a conciliation commission, the Secretary-General of the United Nations shall, if asked to do so by the party that made the request, make those appointments within a further two-month period.

Article 4

If a President of the conciliation commission has not been chosen within two months of the last of the members of the commission being appointed, the Secretary-General of the United Nations shall, if asked to do so by a party, designate a President within a further two-month period.

Article 5

The conciliation commission shall take its decisions by majority vote of its members. It shall, unless the parties to the dispute otherwise agree, determine its own procedure. It shall render a proposal for resolution of the dispute, which the parties shall consider in good faith.

Article 6

A disagreement as to whether the conciliation commission has competence shall be decided by the commission.