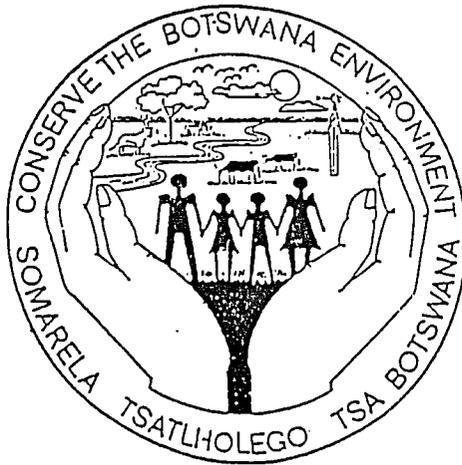




REPUBLIC OF BOTSWANA

BOTSWANA NATIONAL CONSERVATION STRATEGY



SEPTEMBER 1990

THE GOVERNMENT OF REPUBLIC OF BOTSWANA

DRAFT

REPORT ON THE
NATIONAL CONSERVATION STRATEGY

THE GOVERNMENT OF BOTSWANA

APRIL 1990

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GLOSSARY : ACRONYMS AND TERMS

ALDEP	Arable Lands Development Programme
ARAP	Accelerated Rainfed Arable Programme
AV	Audio Visual
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DOL	District Officer Lands
DWA	Department of Water Affairs
DWNP	Department of Wildlife and National Parks
EEC	European Economic Community
ERL	Energy Resources Ltd
FAB	Forestry Association of Botswana
FAP	Financial Assistance Policy
IUCN	The World Conservation Union
KCS	Kalahari Conservation Society
KRDA	Kweneng Rural Development Association
MLGL	Ministry of Local Government and Lands
MMRWA	Ministry of Mineral Resources and Water Affairs
MOA	Ministry of Agriculture
MCI	Ministry of Commerce and Industry
NCS	National Conservation Strategy
NCSAP	National Conservation Strategy Action Plan
NDP	National Development Plan
NGO	Non-Governmental Organization
NORAD	Norwegian Agency for Development Co-operation
NRCSB	Natural Resources Conservation Society of Botswana
NWMP	National Water Master Plan
SADCC	Southern African Development Co-ordination Conference
SIDA	Swedish International Development Authority
SRDA	Southern Rural Development Association
TGLP	Tribal Grazing Land Policy
TLA	Tribal Land Act
UB	University of Botswana
UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
VDC	Village Development Committee
WHO	World Health Organization
WMA	Wildlife Management Area
YWCA	Young Womens Christian Association

'Resource Exploitation' : The term is used throughout to signify malpractices concerning the use and management of natural resources.

'Resource Utilization' : This term describes an activity which, if the resource use is to be termed 'wise', will require a level of use which can be sustained in perpetuity. 'Sustainable utilization' involves only harvesting the annual yield or product of the resource, thereby leaving the capital stocks of the resource in tact for future generations.

P A R T O N E

THE BACKGROUND TO THE STRATEGY :

NATURAL RESOURCE GOALS, USES AND ISSUES

d.

SECTION 1: INTRODUCTION

1.1 BACKGROUND : GOVERNMENT COMMITMENT

1.1.1 Since independence, the need to conserve the country's natural resources has been increasingly appreciated. The Government of Botswana, under its National Development Plan and many national policies, is firmly committed to conservation. This is amply demonstrated by the large tracts of the country designated as National Parks, Game and Forest Reserves and Wildlife Management Areas (WMA's). Approximately 17 per cent of the country has been allocated specifically for the conservation of ecosystems, historic features and wilderness areas. Such areas are an important source of biological diversity. Tourism also depends almost entirely on these areas, which contain many plants and animals. A further 18 per cent of the area has been earmarked under the Wildlife Conservation Policy (1986), as Wildlife Management Areas. It is in such areas that priority is to be given to the utilization of wildlife resources. However, upon approval of the Land Use Plans prepared for each of the nine Districts, the gazettelement process will be completed. Thus, overall, a total of 35 per cent of the country's land and water areas is assigned to conservation uses. On the world scene Botswana is recognized as being the country which, in percentage terms, has the second highest area allocated to nature conservation.

1.1.2 The commitment of Government to conservation is further exemplified by:

- a) the existence of an extensive array of legislation to protect and conserve the environment;
- b) the encouragement being given to the development of agricultural, fishing, tourism, craft and other enterprises, based on the country's natural resources;
- c) the protection of internationally, endangered species, consisting of mammals (7), bird species (6) and reptiles (1);
- d) the protection, under The Fauna Conservation Act, of scheduled species of conserved animals (114) against all hunting;
- e) the operation of a carefully controlled system of licencing, in order to protect wildlife from unlawful hunting.

1.1.3 The Government of Botswana is justly proud of these achievements.

1.2 ENVIRONMENTAL DETERIORATION : THE NEED FOR THE NCS

1.2.1 Whilst Botswana is endowed with many natural resources, its predominantly arid environment is fragile. Botswana is dependent upon these natural resources for both the development and diversification of the economy. Thus, due regard needs to be paid to their

conservation and wise use. Only if this is done can development be successful.

1.2.2 Many of the development pressures being experienced in Botswana are not without harmful environmental impacts. Several natural resources are threatened by pressures associated with rapid economic growth, which take little or no account of long-term effects on the environment. These effects include range-land degradation; the loss of trees for fuelwood without replanting; the depletion of fossil ground water resources; the reduction in wildlife species and indigenous veld products; the erosion of some arable land areas; the generation of rural, urban and industrial wastes leading to pollution of soil and water; the presence of unsightly and hazardous borrow pits abandoned after the extraction of building materials, etc.

1.2.3 Such environmental deterioration, especially when seen to be growing, is not welcomed. It is naturally a source of concern to the Government, to NGO's and to individual members of the community. An added problem stems from the fact that the reasons for this deterioration are many and complex. These include the attitudes and actions of some private sector interests. Unlike the Government, these interests are, in some cases, both oblivious of the over-riding need to conserve natural resources and ignorant of the methods by which sustainable development can be achieved.

1.2.4 Despite the existence of some environmental controls, there are clear grounds for further intervention by Government. Action is required before the environmental changes are either irreversible or overly expensive. The NCS represents the Government's initial response to the challenge.

1.3 ORIGINS OF THE NCS

1.3.1 Consistent with its commitment to conservation, the Government invited the UNEP Clearing House Mission to Botswana in 1983. The resultant recommendation that a National Conservation Strategy be prepared was readily accepted by Government. Responsibility for coordinating its preparation by all interested parties, public and private, was vested in the Department of Town and Regional Planning under the Ministry of Local Government and Lands.

1.3.2 Preparation began in 1985, when the Government invited the World Conservation Union (IUCN) to assist. This it has done by providing Senior Advisors and consultancy expertise. This assistance has been funded by several donor agencies: NORAD, SIDA, the EEC, the Netherlands Government, UNDP, UNEP and USAID.

1.4 NCS PREPARATION : CONSULTATION, PARTICIPATION AND CONCEPT

1.4.1 Great importance has been placed upon consulting all sectors of Botswana society, in trying to reach consensus as a basis for the Strategy. This conforms with national

traditions and practices. All interested parties, from village elders to University staff have participated; several surveys and reports were specifically commissioned. In total, 27 Technical Reports have been produced by experts in Government Ministries and the University of Botswana. They have been drawn upon extensively in preparing the Strategy. As a result of these various consultations, it can confidently be stated that the foundations for the Strategy have been firmly laid at all levels: village, District and Central Government. A strong sense of public commitment to the need for a Strategy has been established (ref. Annex 1 : Figure 1).

2 Under the 5 year rolling programme, which is involved in the preparation of the National Development Plan, the Government of Botswana is committed to "sustained development". This features as one of four main national planning objectives and accords closely with the international objectives declared in the "World Conservation Strategy" and "Our Common Future". These two seminal publications make a compelling case for all development of renewable natural resources to be undertaken on a sustainable basis. The concept applies at all scales: international, regional, national and local. It was thus gratifying to note from the extensive public consultation and participation exercises, that the concept is gaining both recognition and support throughout all sections of the Botswana community.

IMPORTANCE OF "SUSTAINABLE DEVELOPMENT"

1 In preparing the National Conservation Strategy, the Government of Botswana is reinforcing the importance of "sustainable development".

2 This concept is valued for six main reasons:

- a) it focusses attention on the important economic, social and cultural roles, which natural resources can and do play;
- b) it emphasizes the complementary relationship between development and resource conservation. This contrasts with the traditional model of economic growth, in which development is usually achieved at the expense of environmental conservation, and vice versa. However, the complementary nature of sustainable development needs to be interpreted broadly. Development often involves some sacrifice of environment and natural resources. Nonetheless, ways of reducing such sacrifice normally exist. These involve either designing to minimize environmental cost or undertaking resource restoration when costs are significant;
- c) it advocates the use of natural resources on a sustainable yield basis. This entails using the annual yield (income) of, for example, timber growth, water recharge, fish population, etc., so that the original (capital) stocks of the resources are conserved;

- d) it recognizes that sustainable yields and resource carrying capacities can be increased by improved management;
- e) it emphasizes the importance of attaching equal weight to the needs of future and present day populations;
- f) it seeks to ensure that trade-offs are made, where development is unavoidably required at the expense of natural resources. This necessitates taking full account of both the environmental and social costs, as well as the economic costs. For example, assessment is required of the impacts upon social communities, upon wildlife resources, upon tourists, upon public health, etc., as well as of the discounted net financial benefits.

1.5.3 The principle of sustainable development is also valued because its observance calls for comprehensive evaluation of environmental and economic implications before major new developments are undertaken.

1.6 PRIMARY AND DETAILED GOALS

1.6.1 Against this background the broad, primary goals of the Strategy are both to provide policy guidelines and to recommend measures which will:

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

1.6.2 These primary goals, to which Government is committed, provide the basis for a series of detailed strategy goals. The detailed goals consist of two inextricably linked categories, namely: development goals and conservation goals. They are listed below in turn.

1.6.3 There are seven development goals, which are as follows:

- i the development of new and better natural resources uses, which are sustainable;
- ii the optimization of the existing uses which are made of all natural resources;
- iii the development of multiple, rather than single purpose, natural resource uses;
- iv the diversification of the rural economy so as to generate new jobs;
- v the increased education of, and participation by, all members of society in improving the environment;
- vi the development of links with neighbouring countries in conserving resources;

vii the establishment of a balance between population growth and the supply of natural resources.

1.6.4 The counterpart goals, concerning conservation, are:

- i the conservation of all main ecosystems, wildlife and cultural resources;
- ii the protection of endangered species;
- iii the maintenance of stocks of renewable resources, whilst increasing their sustainable yields;
- iv the extraction of exhaustible (e.g. mineral) resources at optimal rates;
- v the distribution of incomes and rewards more equitably, in the interests of conserving natural resources;
- vi the cost-effective restoration of degraded renewable natural resources, including improved capacity for regeneration of vegetative cover;
- vii the prevention and control of pollution.

1.6.5 Achievement of both the primary goals and the detailed goals calls for the involvement of all sectoral interests within Botswana. Collectively, these goals represent the many different facets of "sustainable development", to which the Government is firmly committed.

SECTION 2 : THE NATURAL RESOURCES OF BOTSWANA - PRESENT AND FUTURE

2.1 NATURAL RESOURCES AND THEIR SIGNIFICANCE

- 2.1.1 The continued supply of natural resources and their wise use are essential to the well-being of Botswana. The Government of Botswana is responsible at all times for ensuring that the natural resources are harnessed for the benefit of present, as well future, generations. Growing and sometimes competing demands for these resources exist. Thus, increasingly, compromise and trade-offs have to be considered, in meeting these demands.
- 2.1.2 As a basis for making decisions about issues, where either direct or potential conflicts exist, Government recognizes the importance of receiving up-to-date information. Such information concerns the extent and quality of the country's natural resources (ref. Annex 2 : Table 1). The resources considered to be of greater significance to the Strategy are summarized in this section.

2.2 A PROFILE OF THE NATURAL RESOURCES AND THEIR USES

- 2.2.1 Botswana is a country traditionally well known for its livestock (principally cattle) and for the small size of its population (just over 1 million) relative to its large land area (57.6 million hectares). The country is also internationally renowned for its recently high rates of economic growth; for some outstanding desert and wetland wilderness areas; for its diversity of wildlife; and for its ancient cultures, etc. On the other hand, there are high rates of population growth and urbanization.
- 2.2.2 Despite some serious losses due to droughts and development pressures during this century, Botswana is still a country well endowed with a variety of natural resources. Evidence of these assets and of the natural resource legacies, inherited from both former and present generations, is readily apparent. For some, like diamonds, coal, land and fossil groundwater, the supply is finite. In other cases, such as surface water, human resources, trees, pasture grasses, veld products, wildlife and cattle, the resources are mostly renewable.
- 2.2.3 Unfortunately, despite the country's environmental assets, there is cause for concern on account of several natural resource problems, in particular, the procurement of reliable and low cost water supplies; rangeland degradation; the depletion of wildlife, veld product and wood resources; increases in pollution. It is these which are described later and which the Government seeks to address by preparing this Strategy.

2.2.4 In short, Botswana's environment has two faces. Through the NCS, the task of the Government is to conserve and develop the environmental assets on the one hand, and on the other to remedy, or at least to reduce, the problems.

2.2.5 The principal natural resources covered by the NCS are:

- a) Land resources and the minerals which they contain, along with the vegetation and thus the populations of livestock, wildlife and human resources which are supported;
- b) Water resources, both surface and groundwater supplies, together with the vegetation, fish, livestock, wildlife and human resources which they support.
- c) Human resources and the institutional, legal and infrastructural resources which these have generated.

These are reviewed in the paragraphs which follow.

2.3 LAND AND ASSOCIATED NATURAL RESOURCES

2.3.1 The land resources are valued for three primary uses : for mining; for human activities and habitation; and for the growth of vegetation. The last of these three supports a variety of activities : grazing, wildlife utilization, arable cropping, timber and fuelwood production, and the provision of natural subsistence foods, fruits, fungi, herbs and medicines (collectively referred to as veld products). Each of the three primary uses makes a contribution to the economy, each needs to be sustained and thus each features in the NCS.

Mineral Resources and Mining

2.3.2 The most valuable resources currently provided by the land are minerals. These include diamonds, copper-nickel, cobalt, soda ash, iron, manganese, tin, gold, chrysotile asbestos, specularite and coal. These and other minerals such as platinum, agates, antimony, brines, chromite, feldspar, fluorite, glass sand, graphite, gypsum, kaolin, lead, limestone, marble, potash, silver, soapstone, talc, lime, uranium and zinc, are sources of economic growth. Mining also makes an important contribution towards diversifying the economy. Both individually and collectively the processing and associated downstream activities, as well as the re-investment of mineral revenues, enhance the potential for promoting this diversification.

2.3.3 However, these resources are non-renewable and thus cannot be expected to sustain the economy indefinitely. It is well recognized by Government that both the time-scale and methods adopted for extraction of these minerals can have a profound effect on the physical,

economic and social environments of the country. The legal and other controls already in place have helped to safeguard the physical environment from the harmful effects of mining activities.

Agricultural and Wildlife Resources for Utilization

- 2.3.4 The majority of the land consists of a variety of rangeland habitats used for grazing by livestock and wildlife. These habitats support populations of livestock and wildlife which vary significantly in size and quality according to the annual rainfall, particularly its seasonal distribution and frequency. Fertile land suitable for intensive arable cropping through irrigation is in limited supply. The country's soils are generally of poor quality and of low water holding capacity. Soil erosion is thus a regular problem.
- 2.3.5 Nationally, the herds of cattle (varying between 3 million in 1981 and 2.3 million in 1987) are large. Despite the combined constraints of an arid climate and of generally poor soils, the land resources have supported a livestock industry which has been the backbone of the rural economy. Cattle, sheep and goats, the main livestock resources, yield a wide range of valuable products : meat, milk, hides and a variety of by-products.
- 2.3.6 Cattle, in particular, are central to the lives of Botswana. They are valued for many reasons; as a source of draught power, of organic matter and of traditional building material. Although only a little over half of all rural households own cattle, a significantly greater number is involved in the livestock sector. Smallstock provide a significant proportion of both the protein and important by-products required to rural communities; particularly those in the west of the country.
- 2.3.7 Historically, the majority of livestock occurred in the eastern and north western areas of Botswana. This was due to the distribution of open watering sources in the rivers, pans and the delta. However, livestock later spread to the western sandveld because of pressures from human settlements, increases in human population, and the development of arable and grazing lands. This was made possible, in part, by borehole technology.
- 2.3.8 Overall, the livestock industry plays an important role in meeting the nation's food requirements. It is also a major source of both incomes and employment in rural areas. Importantly, it is second to the minerals sector in contributing export revenues.
- 2.3.9 The diversity of wildlife in Botswana is impressive, including species of 164 indigenous mammals. Game animals represent an important source of food and

income through safari hunting, subsistence hunting and photographic tourism. Although in its infancy, the utilization of wildlife through both private and community cropping/harvesting and farming enterprises is strongly supported by Government under its Wildlife Conservation Policy (1986). In the interests of fostering wildlife utilization, approximately 18 per cent of the country has been designated as Wildlife Management Areas. These are additional to the areas of National Parks, Game Reserves and Forest Reserves, where wildlife resources are protected and conserved. Of particular note is the protection afforded in these latter areas to the country's elephant population which is one of the largest of Southern Africa. This, based on the most recent count, is estimated at 67,000 (DWNP, 1989).

- 2.3.10 One of Botswana's greatest assets is its considerable biological diversity, which stems directly from a wide variety of terrestrial and aquatic habitats. In addition to the indigenous mammals, the country is known to have between 5,000 and 10,000 insect species, 3,000 plant species, 540 bird species, 157 species of reptiles, 80 different fish species and 38 species of amphibians. From these resources many direct and indirect benefits both can be and are derived. These include: increases in the production of food, medicinal and wood resources; the protection of valued species in the food chain; assistance with the regeneration of plants; the formation and enrichment of soils; the control of pests; improvements in crop production; and the provision of many commercial development opportunities.
- 2.3.11 However, the livestock and wildlife sectors face the widespread and significant problem of rangeland degradation. This is due to a complex array of factors, in which overgrazing plays a prominent but not exclusive role; harvester termites in some locations are the major cause of degradation.
- 2.3.12 Rangeland degradation, due to overgrazing whether by cattle or wildlife, is manifest by trampling, by loss of the grass and browse cover leading to exposure of the soil, so that it becomes prone initially to erosion by wind and water, and ultimately, through the complete removal of vegetation, to desertification in extreme cases.
- 2.3.13 The key to the successful management of all rangeland lies in matching stocking rates to carrying capacities. This entails ensuring that:
- a) the nutrients and energy resources retained by the grazed plants, together with soil moisture, are sufficient to enable them to regrow and regenerate in a sustained manner;

- b) the intervals between stocking the land are appropriately adjusted to enable grazing to be sustained on a regular basis.
- 2.3.14 When over-stocking and overgrazing occur the natural ability of the palatable pasture plants to regrow is suppressed. Unless the numbers of grazing animals are reduced so as to match the carrying capacity of the pasture, the grasses are weakened; ultimately to the point where their energy and nutrient resources are exhausted. Death is inevitable. The less palatable, often annual grasses take over. Usually thorny shrubs invade quickly and then dominate. During periods of drought, particularly when prolonged, the length of time over which grasses can withstand overgrazing is reduced. A further aggravating factor is the naturally low fertility of most soils.
- 2.3.15 Overgrazing occurs when the densities of cattle and/or wildlife exceed the carrying capacities of the rangeland. This tends to be particularly pronounced in period of drought. During the last drought, which ended in 1987, it was estimated that approximately 25 per cent of the rangeland was degraded due to a variety of factors : water shortage and overstocking; a further 5 per cent was seen to have deteriorated (but not permanently) due to drought; and just under 2 per cent was suffering from desertification. Trends suggest that progressively over the years, parts of the rangeland has been used in ways which cannot be sustained. The Government recognizes that restoration of these parts will require significant changes in both management and more fundamental factors, such as land tenure.

Arable Cropping Resources

- 2.3.16 The maintenance of strategic food supplies is central to the Government's arable production policy. The need to sustain this policy as part of the NCS is well recognized. However, the extent to which it can be applied is influenced by soil and water constraints, which limit the area of land suitable for intensive agricultural production under irrigation.
- 2.3.17 Dryland farming predominates. Adverse weather conditions can result in a significant proportion (over 66%) of the crop sown in some years failing to produce an acceptable yield. The total average annual size of the national harvested grain crop ranges between 20,000 tonnes in drought years and 116,000 tonnes (1988) in non-drought years, out of an annual requirement of 200,000 tonnes. This represents between about 10 and 25 per cent of national domestic requirements, the balance being imported. Whilst growth of the sector has been slow, significant numbers of rural families are involved in arable production. It should be noted, moreover, that the value of the harvested crops does

not represent the full contribution of the sector. The livestock sector benefits from the feeding value of both arable by-products and from those crops which are not harvested.

Timber and Forest Resources for Utilization

- 2.3.18 Certain areas of Botswana, especially in Chobe District, have extensive tree cover. Although the Forestry sector is not a major feature of the economy, it nonetheless makes important contributions through the supply of fuelwood, poles, other construction timber and commercial logging. Woodfuel annually accounts for about 36% of the total energy sources of the nation. This represents over 87% of rural energy supplies and meets approximately 95% of the total domestic demand for energy. The sector is extremely important to the poorer elements of both rural and urban communities.
- 2.3.19 The importance of managing the country's woodland resources is well recognized by Government. To this end, Forest Reserves were gazetted in 1967 and a Forestry Policy was prepared by the Ministry of Agriculture. The Policy is geared to protecting, conserving and, where possible, perpetuating the remaining indigenous forest resources around Kasane and Chobe. In these areas felling operations are licenced under contract and yield an annual royalty to Government. It is gratifying that the essential inventories are now being prepared as a basis for management plans. The Energy Unit and the MMRWA are also undertaking an inventory of wood resources around major villages to determine the availability of fuelwood.
- 2.3.20 Elsewhere there is growing evidence of serious depletion of trees around settlements, with little attention being given by local communities either to regeneration or replanting. In South East, Kgatleng, Southern and Kweneng Districts there are increasing areas where fuelwood shortages are experienced. Although in national terms the estimated annual offtake of not more than 1.0 million tonnes compared favourably with the conservatively estimated total annual increment of 7.0 million tonnes (ERL, 1985), the localized areas of depletion provide genuine cause for concern.

Veld Products and their Utilization

- 2.3.21 These land-based resources are also recognized by Government to be important, both in terms of subsistence and commercial contributions. In the former case, this entails the direct harvesting of at least 150 wild food plants, which grow naturally in the wild. They include melons and cucumbers, tubers and roots, bulbs and corms, berries and fruits, nuts,

edible leaves and fungi. Some of these occur in great abundance. Significant numbers of insect species, including caterpillar, locusts, flying ants, beetles and bees, also provide food. In addition, a very wide range of plants, and to a lesser extent insects, are collected for medicinal purposes.

- 2.3.22 Other veld products are either sold directly or processed into baskets, mats, household utensils, chairs, curios, jewellery, etc. and are then sold as a supplementary source of cash income. Specified products of commercial value include thatching grass, reeds, building poles, phane, morama nuts, truffles, palm fronds, grapple plant as an antidote for arthritis, and the cocoons of the Gonameta moth for silk production.
- 2.3.23 There is evidence that, unfortunately, some of these veld products have been over-harvested, thereby diminishing their stocks. Such exploitation, as in the case of wood resources, is in direct opposition to the Government's objective of sustainable development. The need to counteract this is well recognized.
- 2.3.24 Initial steps to utilize these resources on a sustainable basis have been taken by the Ministry of Agriculture in conjunction with the NGO, Thusano Lefatseng. Already the grapple and other veld plants are being grown under cultivation.

Overall Appraisal of Land-Based Natural Resources

- 2.3.25 The review of these natural resources, conducted by Government officers and other researchers in preparation of this NCS, indicates that there are instances where serious overharvesting of resources occurs. However, there are equally clear indications of under-utilization. The over and under-utilization applies to all land-based resources, including the use of rangeland for livestock grazing. For example, the problem of overgrazing is viewed by the Ministry of Agriculture as being due in part to the maldistribution of stock, since many areas are ungrazed. Thus, the Ministry indicates that nationally livestock numbers - at least during non-drought periods - are below the potential carrying capacity.
- 2.3.26 The scope which exists for improving the use of land-based natural resources points firmly to the need for the NCS to play a dual role. As well as rectifying the overharvesting problem, the Government is particularly committed to harnessing the potential for improving the utilization of these resources. In fulfilling this dual role, attention will focus upon improving management, so that both economic and environmental returns are increased.

2.4 WATER AND ASSOCIATED NATURAL RESOURCES

- 2.4.1 Botswana relies on two main sources of water : surface and ground water. In a semi-arid country water resources are one of the main keys to development. Their conservation and efficient utilization are therefore matters to which Government devotes priority attention.
- 2.4.2 The main potential surface water resources exist at the extremities of the country: the Okavango River in the North West; the Limpopo River on the Eastern Border; and the Chobe-Zambezi River system in the North. All of these are remote from the areas of highest demand. Currently, most surface water resources are supplied from dam sites, which are, themselves, scarce resources owing to the generally uniform topography. Most of the less expensive sources are already being utilized, with the result that in future supply costs are likely to increase dramatically. However, it is expected that dams on the Shashe and Motloutse rivers will provide reasonably low cost water, at the dam outlets.
- 2.4.3 The Technical report, prepared for the NCS by the Ministry of Mineral Resources and Water Affairs, emphasizes that Botswana is heavily dependent upon its ground water resources. Without ground water, large parts of the country would be uninhabitable. All of the approximately 300 small villages are supplied from these resources. However, unfortunately Botswana is not well endowed with ground water, in comparison with other countries. The supplies are often saline. Where known, the rate of recharge is often low. In some areas there is no recharge, making groundwater a finite resource. However, unfortunately to a large extent, recharge rates are not known. Moreover, the extent of the aquifer reserves is largely undetermined. Groundwater is also unevenly distributed. Since the success of both livestock and wildlife utilization enterprises is in large measure dependent upon ground water resources, the conservation of these resources is a matter to which Government attaches great importance.
- 2.4.4 Both surface and groundwater recharge depend upon rainfall. The contribution of the rain falling within Botswana to both forms of recharge is erratic. In the case of groundwater recharge, rain is effective only when associated with fairly intensive rain storms and falling on already moist soil, especially in view of the high evaporation rates. Recharge is best where soils are shallow.
- 2.4.5 In Botswana, like other developing countries, the trends in domestic water consumption give cause for concern. As society becomes more urbanized and supplies are reticulated, the per capita usage of water increases. The Department of Water Affairs expects that domestic water supply demands will grow rapidly in

the future, especially in major rural settlements where the per capita consumption is presently low compared with urban areas. It is not unlikely that the total domestic water demand could increase by a factor of 4 over the next 20 years. Thus, it is expected that the provision of water will cause a heavy strain on financial resources and that renewable surface water will be required to meet the demands.

- 2.4.6 Overall, future demands and supplies can be balanced (ref. Annex 1, Table 2). However, it should be stressed that the balance is not uniform throughout the country. Northern and Central Regions are relatively well equipped with resources to meet the overall predicted demands. It is in the Southern Region that a very serious shortfall exists, such that a new major source is likely to be required 'on stream' by 1995. Indeed, the urban areas and major villages in the South East Region will require a major new resource within 6-7 years time.

Resource Utilization

- 2.4.7 The natural waters of Botswana, in addition to serving agricultural, domestic, mining, industrial and wildlife interests are valued by Government for the national fishery which they support. Botswana's fishery is concentrated in the 10,000 square kilometres of the Okavango Delta, accessible regions of the Chobe/Linyanti river systems, Lake Liambezi and, periodically, Lake Ngami.
- 2.4.8 The fishery is characterized by an extremely rich fauna of at least 80 species, of which Bream (Tilapia), Barbel (Catfish), Tiger Fish, Silver Barbel and species of mormyrids provide the best opportunities.
- 2.4.9 Presently, the total harvest from the Okavango waters is estimated at some 1,700 tonnes per year. To date, one of the biggest contributions of the sector has been to provide the main source of protein to schools and clinics under a feeding scheme, operated by the Department of Food Resources.
- 2.4.10 Whilst the total contribution of fishing to local communities is imprecisely known, its importance is well recognized by Government: some 12,000 local people are known to spend time fishing in the Okavango.
- 2.4.11 Importantly, as in the case of the land-based resources, the present level of resource utilization by the fishery industry is considered to be far lower than the sustainable yield, possibly by a factor of ten.

2.5 HUMAN AND RELATED RESOURCES

- 2.5.1 With a population at the last census of under 1 million, Botswana has one of the lowest population

densities in the world. Yet it has one of the fastest growth rates (3.32% p.a) with regard to increases in both population (61 per cent : 1971-1981) and urbanization (162 per cent : 1971-1981). By the year 2000, it is estimated that the population will have doubled to around 2 million. Indeed, young people are at present one of the fastest growing natural resources of the country. This has inevitable implications on most other natural resources and upon the educational sector. Examination of demographic and natural resource trends suggest that there are likely to be problems of imbalance. Based on realistic assumptions about levels of technology and management skills, the relationship between people and land resources in particular, is likely to be increasingly under pressure during the two decades. It seems unlikely that there will be sufficient land and water resources to enable all rural families to engage in livestock, irrigated or dry land farming. The need to pursue both policies and programmes of rural and industrial diversification is well recognized by Government. The NCS natural resource studies serve to reinforce this.

Customs, Social Values and Skills

- 2.5.2 Equally of relevance in preparing the NCS are the attitudes, customs and social values of the population regarding the use of natural resources. It is well recognized by Government that many natural resources, particularly land, water and wildlife, are regarded by Botswana as 'free goods' available for the benefit of the community. Apart from a few traditions, which help to conserve particular animals or trees, some traditional practices are directly incompatible with sustainable use. In particular, communal grazing practices tend to encourage exploitation rather than wise use of rangelands.
- 2.5.3 Such social attitudes and practices underline the need for the NCS to contain major educational and public awareness components, if the Government's objectives are to be achieved. It is considered that top priority attention needs to be given to helping decision-makers in both the public and private sectors, to improve their understanding of environmental issues.
- 2.5.4 However, the human resource challenges do not end there. Another serious problem is the shortage of Government officials and indeed of private individuals who have received any form of environmental training. Significant staffing shortfalls exist in the Departments of Wildlife and National Parks, of Forestry and of Town and Regional Planning. It is therefore not surprising that, for example, Management Plans for many of Botswana's major ecosystems have still to be prepared.

- 2.5.5 There is also growing awareness of the need to reinforce the resources allocated to the important task of legal enforcement. It is also considered that the severity of sentences dispensed for illegal hunting, and particularly for poaching, should be increased so that they:
- a) are compatible with those which apply in the case of cattle theft, etc.; and
 - b) fit the seriousness of the offences committed.

Insights into this and the problems of legal enforcement are described in the Technical report on Social Values prepared for the NCS by the Ministry of Local Government and Lands.

Institutional and Legal Resources

- 2.5.6 Institutional and legal resources are closely allied to human resources. The success of an NCS is significantly dependent upon such resources. It is thus gratifying to the Government that in these respects a number of solid foundations exist (ref. Annex 1 : Figure 2).
- 2.5.7 Successive Governments have put in place a considerable amount of environmental legislation. For example, National Parks and Game Reserves have been successfully gazetted under the National Parks Act and the Fauna Conservation Act respectively. Several efforts are currently being made to improve resource planning and management through, for example, institutions (District Land Boards, and District Land Use Planning Units) and the enforcement of legislation (the Agricultural Resources Act and the 1986 Wildlife Conservation Policy.) However, as in many countries throughout the world, the enforcement record is generally poor.
- 2.5.8 Although Botswana is fortunate in having a broad spectrum of Government institutions, current sectoral and cross sectoral interests, both the resource use and management responsibilities are significantly fragmented between Ministries (ref. Annex 1 : Figure 3).
- 2.5.9 There is also a wide array of NGO's with which the Government enjoys good relations in seeking conservation and environmental improvements. These include The Association of Wildlife Clubs, The 4B Clubs, The Botswana Bird Club, The Botswana Council of Women, The Botswana Society, The Brigades, The Kalahari Conservation Society, The Forestry Association of Botswana, The Natural Resources Conservation Society, Thusano Lefatsheng, The Young Women's Christian Association, The Workcamp Association, Village Development Committees and The Botswana Christian Council, etc., all of which are active in promoting not only the 'conservation through development' ethic, but also in undertaking practical works.

- 2.5.10 However, as noted in the NCS Technical report prepared by the Ministry of Home Affairs on 'Group Participation', there is an even greater number of voluntary groups which needs to adopt a more positive attitude towards conservation. Both youth (especially the Boy Scouts) and Womens Groups are examples of organizations, which it is thought, through relatively little re-orientation of their activities could contribute much towards improving the environment. As the Ministry of Health notes, in many countries women play a very important role in both conserving and improving the environment. In Botswana, women should be given every possible encouragement to fulfil the same role though not to the exclusion of their male counterparts. In this respect, a lead is being given by the YWCA, which has a sub-committee specifically established to tackle environmental problems.
- 2.5.11 Based on international experience, the links between Government institutions and the NGO's almost certainly require to be strengthened, if the NCS objectives are to be achieved. Likewise, it is recognized that considerable attention will need to be paid both to coordinating the institutional resources and to enforcing, as well as updating, the environmental legislation in support of the NCS.

Infrastructural Resources

- 2.5.12 Infrastructural resources, like the institutional resources, are important. They have a strong bearing on the extent to which "sustainable development" initiatives are likely to succeed.
- 2.5.13 In terms of physical infrastructures, the resources vary considerably in both quantity and quality. This applies to the stock of housing, utilities and transport services. Although the basic infrastructural resources are in many cases available, there are, as noted in the NCS Technical report on 'Settlements' prepared by the Ministry of Local Government and Lands, some notable shortcomings, namely:
- a) the water supply, sanitation and sewerage facilities for a significant proportion of dwellings are below WHO standards: (21 per cent of total urban housing units are without sanitation; 58 per cent of rural settlements of 5000+ population are without sanitation; and 84 per cent of smaller settlements are without sanitation.);
 - b) the National Settlement Policy has, unfortunately, not resulted in the desired physical decentralization from Gaborone;
 - c) most settlements have not been landscaped and many of the open spaces, potentially available for recreation, are either used as waste dumps or encroached upon by developments;

- d) the housing densities adopted in many rural settlements are very low and thus uneconomic;
- e) some settlement structures are haphazard, thus making the provision of reticulated services both difficult and costly;
- f) litter collection facilities are inadequate;
- g) soil degradation, overgrazing, erosion and deforestation are particularly pronounced around most settlements.

The Government recognizes that the NCS should as far as possible help towards reducing these deficiencies.

2.6 OTHER RESOURCE CONSIDERATIONS

2.6.1 This review would not be complete without referring to three important dimensions, namely:

- a) the influence of external resources (aid, trade and relations) upon the "sustainable development" of Botswana's natural resources;
- b) the heritage and cultural resources which play a particularly important role in the development of new industries, such as tourism;
- c) the linkages which exist between natural resources and which need to be strengthened by Government in implementing the NCS.

The Government recognizes that such dimensions demand attention.

External Resources : Aid, Trade and Relations

2.6.2 Botswana's natural resources are variously affected by external factors, which in turn are under the influence of human and institutional resources. These external forces, especially the activities of donors and trading arrangements have a direct bearing on development activities. They have not always had a benign effect on the environment. Thus, there is a strong case for subjecting all development projects to environmental impact assessment, at the planning stage.

2.6.3 At the same time it needs to be recognized that external forces, such as international trade, can significantly influence Botswana's environment. As a generality, exploitation as distinct from wise use of natural resources tends to increase as the level of per capita income decreases. Thus, any external factors which lead to reductions in national exports and especially in rural income levels are likely to damage the environment. It is recognized that the environmental consequences of both international trade and relations call for careful scrutiny at all times.

- 2.6.4 Participation by Botswana in international agreements and conventions is one way in which external forces, potentially harmful to the environment, can be countered. Through membership of SADCC and as a signatory of both the CITES and the African Convention on the Conservation of Nature and Natural Resources, Botswana is better placed to meet its environmental challenges. Accession to both the International Wetlands (Ramsar) and the World Heritage Conventions would undoubtedly provide further support.

Heritage and Cultural Resources

- 2.6.5 Botswana possesses many heritage and cultural resources, which are a source of considerable pride to the nation. These resources are of four distinct types: natural and man-made landscapes; ancient monuments and relics; remains of more recent origins and social customs (ref. Annex 1, Figure 4). As noted by Government, many of these resources attract significant numbers of visitors to the country.
- 2.6.6 However, if the full tourism potential of these resources is to be realized, then investment in facilities, publicity and management will be needed. Once again, the background technical reports have highlighted an opportunity for improving resource utilization.

Resource Linkages

- 2.6.7 Whilst individually the natural resources reviewed are important, their development on a sustainable basis depends on developing the relationships and linkages between them. This was repeatedly emphasized in the NCS Technical reports, especially the report prepared on Population Resources (ref. Annex 1 : Figure 5). Most of the sustainable development opportunities identified in the course of this review are dependent upon encouraging these linkages.
- 2.6.8 The linkages between resources are such that competition for the use of the resources gives rise to inevitable conflicts of interests. One of the purposes of the Strategy is to assist in both preventing and resolving conflicts.
- 2.6.9 The NCS Technical reports, have revealed that many of the activities which the land, water, human and associated resources support, as well as the resources themselves, are in need of special attention. In preparing the Strategy each of the main uses has been objectively studied. The findings were submitted to, and approved by, the Interministerial Coordinating Environmental Sub-Committee (ICES). Collectively they have helped with the task of identifying the main issues which need to be addressed under the Strategy. It is these issues which are the subject of Section 3.

SECTION 3 : THE NATIONAL CONSERVATION STRATEGY ISSUES

3.1 THE MAIN ENVIRONMENTAL ISSUES/CHALLENGES

3.1.1 Arising out of its review of the country's natural resources, and fully cognizant of the views expressed during the public consultations, the Government decided that five main environmental issues should be addressed by the Strategy. These are listed below, but are not ranked in order of priority:

Issue A : How should the increased pressure on water resources be resolved?

Issue B : What should be done at least to halt degradation of the country's rangeland and at best to restore the 'lost lands'?

Issue C : What action should be taken to stem and ideally to reverse the depletion of wood resources?

Issue D : What measures should be adopted to prevent the overuse of veld products?

Issue E : How best should pollution in industrial and urban areas be prevented and controlled, and urban environments be enhanced?

3.1.2 Preparation of the Strategy has not been confined exclusively to these five issues. Other issues, such as population, also feature. Reference is made to them at the end of the section.

3.1.3 This section, in concluding Part One of the Strategy Report, outlines each of the issues. Inevitably, emphasis is placed on clarifying the problems and opportunities. The intended responses of the Government follow in Part Two.

3.2 ISSUE A : PRESSURE ON WATER RESOURCES

3.2.1 The selection of this as the first issue reflects the recognition by Government that water is probably the single most important natural resource, which influences development.

- 3.2.2 The pressure on water resources stems, among other factors, from the fact that major water supplies of regional and national importance have been mainly claimed for single-purpose uses with little consideration of their importance or potential in a wider context. This does not ignore the fact that the Department of Water Affairs and the Water Utilities Corporation have been quite successful in identifying and developing water resources. For instance, groundwater sources have been developed for a large number of rural villages, for some land areas and privately-owned cattle posts and for other scattered consumption points. Indeed, water development has been a major contributor to the growth of the livestock sector. However, there is recognition that there is a need to improve the management of these water resources, so that supplies are sustained.
- 3.2.3 There has been relatively little monitoring of the groundwater levels and characteristics. It is feared that groundwater recharge is often insufficient to balance the draw-off. As a natural consequence, this leads to gradual exhaustion of groundwater resources. Moreover, it is envisaged that in future the provision of water will become more difficult and costly, as local resources will no longer suffice and all the lowest cost solutions have already been used.
- 3.2.4 The issue, which is compounded by lack of knowledge about the levels of water use that can be sustained, is ascribed to five main factors:
- First, the rapidly increasing demand in urban areas and large villages, resulting from population growth, urbanization, improved living conditions and industrial development;
- Secondly, the locational mis-match between demand and supply centres. Surplus surface water resources are located in the north (Okavango and Chobe) and northeast (potential dam sites around Francistown). Procurement of additional sources for south eastern Districts is likely to be considerably more expensive, involving major redistribution works;
- Thirdly, the fragmented institutional responsibility for water development, allowing major water resources to be claimed for single purposes only, where multi-purpose use would have been possible;
- Fourthly, the lack of a comprehensive policy, to use water rights as a regulatory means of achieving sustained development;
- Fifthly, the development work undertaken in rural areas without reference to resource availability.

All of these factors were recognized by Government when drawing up the terms of reference for the preparation of a National Water Master Plan. Thus, although they will be addressed by the consultants commissioned to prepare the Plan, it is appropriate that they should be covered by the NCS; at least in the interim.

3.3 ISSUE B : RANGELAND PASTURE DEGRADATION

- 3.3.1 Degradation of rangeland pasture has occurred through overgrazing for a variety of reasons. Undoubtedly, the process has been aggravated and accelerated by the prolonged drought, but the causes go deeper and are due to a combination of complex factors.
- 3.3.2 The biggest cause of pasture degradation, due to overgrazing, is attributed to the mal-distribution of livestock. This is considered to be the result of water resource and management decisions, which fall under the influence of Land Boards. Under the Tribal Land Act, the Land Boards were granted considerable powers. For the most part, these have not been enforced, due in some cases to lack of resources. Paradoxically, whilst badly overgrazed areas exist in some locations, elsewhere the rangeland is without stock.
- 3.3.3 The second factor, which contributes significantly to overgrazing, concerns the Tribal Grazing Land Policy. Unfortunately this Policy has not led to the permanent removal of most large herds from the communal areas. Consequently, it has not relieved grazing pressures there. The communal system of land tenure which predominates is itself a problem, as is the scope which exists for the managers of freehold farms and TGLP leasehold ranches to exercise the owner's dual grazing rights. The latter give owners the right at any time to release the stock from their private pastures so that they can graze the communal areas, regardless of the carrying capacity. This practice unfortunately tends to increase when grass on both 'private' and communal lands is in short supply. The Government is presently investigating methods which will alleviate the problems caused by dual grazing rights.
- 3.3.4 A third major cause of degradation is considered to be the availability of 'cheap' water to some borehole users. As a general principle there is a need to educate farmers of the role which water use and thus pricing can play in influencing the state of the rangeland. It should be recognized that the price charged for water should cover both the running and replacement capital costs of supply. This reflects the need not only to conserve valuable water resources but also the other natural resources dependent upon water.
- 3.3.5 The Government recognizes that the attempts made to contain overgrazing have so far largely been

unsuccessful. The necessary administrative, educational and legislative tools exist, but in general they are neither effectively used nor enforced. The existing borehole spacing policy limits overgrazing, but on its own is not enough. It needs to be supplemented by limiting the number of livestock per borehole. In short, the establishment of the Agricultural Resources Board and the Land Boards as means of controlling the management of grazing resources has not filled the gap left, following the change in the traditional management structure previously provided by the Chiefs and overseers. Furthermore, there has been a tendency for the Government's limited extension services to be steered to the arable sector. Government extension services have also been directed towards the livestock sector but in the area of animal disease prevention, through veterinary assistants. Whilst the task of increasing productivity has tended to be neglected, this should be improved as a result of the integration of the Division of Animal Production into the Department of Animal Health. The establishment of the Range Inventory and Monitoring system should also improve the ability of MOA to provide information to livestock producers on appropriate stocking rates.

- 3.3.6 These underlying causes all need to be addressed if the problem is to be overcome. The necessary result of all solution measures must be the adjustment, (redistribution/reduction) of stocking levels, so that they match the particular stocking capacities (i.e. regional, seasonal, etc.) of the pasture concerned. Only through such essential adjustments can the overall outlook for the country's livestock and embryonic wildlife utilization industries be really secure.

3.4 ISSUE C : DEPLETION OF WOOD RESOURCES

- 3.4.1 The public consultation campaign undertaken by Government in preparing the NCS revealed that the disappearance of trees is regarded as a most serious environmental problem, second only to over-grazing.

- 3.4.2 Wood is an important resource for energy purposes (cooking, heating and lighting,) for the fencing of compounds, arable land and kraals, for crafts and for general construction purposes. A survey conducted into wood usage in eastern Botswana revealed that the uses of wood for energy and for agricultural purposes are almost equal, each accounting for approximately 45 per cent of the estimated total use. In rural areas in particular, wood is the major source of energy and fencing material. However, wood is also used in urban areas by households and institutions. It is especially valued by low income groups, which depend upon it for cooking.

- 3.4.3 Wood resources are being depleted locally around urban areas, around large rural villages and even regionally in South Eastern Botswana. This occurs because there has been virtually no management either to regenerate or to replenish through new planting. The most direct causes of depletion have been high population growth and increasing urbanization.
- 3.4.4 The problem has been exacerbated due to the fact that management of the Forestry Sector has been severely hampered both by shortages of experienced technical staff and by fragmentation of institutional responsibilities between the Ministry of Agriculture (resource management) and the Ministry of Mineral Resources and Water Affairs (energy supply). As a result, essential inventories and regular stock takings have not been undertaken. Thus, utilization licenses have been issued to companies in the north without knowing the yield levels which are sustainable. However, the Forestry Association of Botswana has drawn the attention of interested parties to the need for inventories. Consequently, these are now being prepared.
- 3.4.5 The impacts of resource depletion vary between urban and rural areas. Interestingly, the NCS Survey found the price of wood to be the most important issue in urban areas, whereas the distance and time involved in wood collection was the most acute rural problem. These are the two most important socio-economic effects of depletion. They fall heavily upon the lower income groups. However, it is at the same time recognized that the demand for timber does provide a source of both employment and income.
- 3.4.6 The impacts of the depletion of wood resources are environmental as well as socio-economic. Environmental effects occur mostly in conjunction with overgrazing. Wood cutting affects the larger trees and leaves mostly shrubs. Seed sources of trees are depleted and on occasions, totally lost. The cutting of trees often increases erosion, particularly in hilly areas or overgrazed rangelands.
- 3.4.7 The Technical reports prepared for the NCS pinpoint the need for the development of fuel substitutes, as well as for significantly improved management of the remaining wood resources. In the latter case, the steps currently being taken by the Ministry of Agriculture to strengthen the Government's existing Forestry Unit, are encouraging.

3.5 ISSUE D : OVERUSE OF VELD PRODUCTS

- 3.5.1 Veld products are harvested throughout Botswana. Dependence on them is greatest in the west and north where alternative economic opportunities, such as livestock production, are limited. In those areas they

provide a major source of "income in kind" for poor sections of the population. Thus, they are particularly valuable.

- 3.5.2 Whilst traditionally veld products have been used in the main for subsistence purposes, more recently commercial uses have developed involving processing in some cases. Although the annual levels of veld product usage and thus the extents to which products are threatened are not known, it is certain that depletion of some veld products occurs at both local and regional levels. Examples of depleted resources are thatching grass, mokala palm and the grapple plant. The depletion occurs due to lack of care taken when harvesting, resulting in destruction of plants' regenerative powers.
- 3.5.3 The effects of depleting veld products are mainly socio-economic. In rural areas there is the loss of both potential income and employment opportunities derived from harvesting and processing industries (e.g. basketry). If depleted, natural resources used for building, such as thatching grass and poles which tend to be regarded as freely available, may have to be replaced by manufactured substitutes. The people most affected are those who depend on these resources for their subsistence.
- 3.5.4 Recently there has been some progress in halting the depletion of one veld product: the grapple plant. The Agricultural Resources Board has introduced a license system for the harvesting of the grapple plant, mainly in Kgalagadi and Southern Districts. In the latter district a pilot project in three villages is intended to encourage sustainable harvesting. The Board has been assisted in this by the NGO, which was specifically established to assist both the protection and sustainable development of all veld products: Thusano Lefatsheng
- 3.5.5 The trend towards increased use of veld products is likely to continue in future, due to the predicted population growth and because rural industrialization efforts will increase the demands for processing purposes. The Government recognizes that other initiatives will be required to prevent depletion of these products, some of which offer the potential for creating new industries and thus employment. To this end the Ministry of Agriculture is embarking upon a major reorganization of the Agricultural Resources Board. The Ministry has also recently formed a committee to co-ordinate the activities of those involved in veld product development, including both NGO's and other Ministries.

3.6 ISSUE E : INDUSTRIAL/URBAN POLLUTION AND URBAN ENHANCEMENT

- 3.6.1 Pollution is increasing in the country. As far as is known, serious pollution is presently limited to a few

locations : it occurs in Selebi-Phikwe (air and water pollution), around large settlements (groundwater pollution) and in some industries, such as tanneries and mineral workings.

3.6.2 Pollution is evident both in and around settlements from a variety of sources: litter, dumping and unsightly stock piling. It is particularly serious in urban areas. It manifests both a lack of civic awareness and the absence of effective incentives and controls which prevent pollution. The effects of pollution are harmful to both the physical and to socio-economic environments. Pollution, for example, may affect natural resources and render them less suitable for development purposes. This is particularly serious for the country's most scarce resources, such as water. Nitrate pollution of groundwater around villages is suspected to be caused by inadequate sanitation systems.

3.6.3 One of the main reasons for the increase in pollution is the fact that currently the 'polluter must pay' principle is not enforced. Often pollution is not identified. Only recently have Environmental Impact Assessments (EIA's) been undertaken as a feature of major Government projects. Both the Agricultural Resources and Water Apportionment Boards play a partial role in protecting the environment. However, there is no overall or specific environmental protection agency.

3.6.4 Another serious deficiency is the lack of adequate control over the disposal of site debris following industrial/urban development. This has already led to the unnecessary destruction of some land and landscape areas. The lack of civic consciousness is hardly surprising when, for the most part, leading industrial operators in the country do not - and moreover are not required - to set a good example. There are, however, some notable exceptions, e.g. the recycling activities of Metal Box and Kgalagadi Breweries, etc.

3.6.5 The legislation both to control and regulate the disposal of mine wastes exists, namely:

Sections 27 and 40 of the Mines and Minerals Act, 1976;

Part XVII of the Mines, Quarries, Works and Machinery Regulations, 1978.

However, whilst this legislation is effective in controlling the activities of commercial quarry operators, it unfortunately does not cover non-commercial activities, especially the digging of sand and gravel for road construction. There is complete agreement between Central Government Ministries and Local Government Officers that legal regulations need to be extended so as to control non-commercial as well as commercial quarrying activities, including sand and gravel extraction.

- 3.6.6 Whilst quite rightly the Government regards pollution as an important issue, it is important to maintain a sense of perspective. To date, pollution has been limited to a few industrial and other human activities. However, the Government is conscious of the need both to eliminate and to prevent all sources of pollution. Thus, mention needs to be made of the serious efforts taken by one Government institution, for example the Department of Water Affairs, to address the problem:

In the 1970's the Geological Survey's G.S. 10 Project, drew attention to the problem of nitrate pollution of boreholes. As a result, the Botswana water sector has, wherever possible, sited boreholes provided for village water supplies sufficiently far away in order to avoid pollution;

Recently, together with MLGL, the DWA developed guidelines for establishing protection zones for the Gaborone Dam and the Ramotswa well-field, based on an earlier consultancy study. These guidelines are being extended to apply to other water sources throughout the country. The intention is to develop protection zones for other existing and proposed water resources.

- 3.6.7 The Government recognizes that monitoring and control mechanisms will need to be strengthened, if future economic developments are not to exacerbate pollution problems. The need for regular monitoring applies particularly in the case of fragile ecosystems, such as the Okavango Delta, where farming is also a growing activity, both for subsistence and commercial purposes.
- 3.6.8 The Government attaches great importance to the provision of both rural and urban settlement structures, which are well planned, designed and managed. The health and social well-being of the population and indeed the productivity of the workforce are known to depend upon the qualities of these environments. Such environments also strongly influence the attitudes of both visitors to the country and especially those considering the options for siting new businesses.

3.7 OTHER ISSUES

- 3.7.1 During the preparation of the NCS, it became evident that three other issues called for attention. These concern the increase in human population, the depletion of wildlife populations and the need to raise public awareness about environmental issues in Botswana.

The Population Issue

- 3.7.2 The problems raised by an expanding population are undoubtedly central to the NCS. Attention is rightly drawn to the resource imbalances which are likely to

occur if population pressures persist (ref. Annex 1 : Figure 5). It is generally clear that the growth of the country's population calls for Government intervention in a number of ways. Indeed, it is increasingly recognized that Botswana's environment provides a fragile and comparatively austere base for developing food-producing enterprises.

- 3.7.3 Whilst there is some support for the view that, because it is a large country, Botswana has the capacity to sustain significantly higher populations, it is generally clear that the growth of the country's population calls for Government intervention in a number of ways. Such intervention is currently achieved in a number of ways through the activities of both the Parliamentary Council and the Inter-Ministerial Committee concerned with Population and Development. The activities have centred on studying the problems and implications associated with population growth. They have led to a series of guidelines and a number of both direct and indirect initiatives. These include primary healthcare, nutritional, educational and economic development programmes. It is considered that the Strategy could and should support these. This is best done by highlighting the new opportunities for generating both income and employment, which can be achieved through the sustainable development of natural resources.

The Depletion and Conservation of Wildlife Issue

- 3.7.4 During the public consultations, considerable concern was expressed in some quarters about the declining populations of many wildlife species. The grounds for this concern relate in large measure to the fact that in some areas the opportunities for utilizing these important natural resources may be in jeopardy. The need to improve both the resources and measures available for the control of poaching was stressed in particular; likewise the provision of boreholes specifically for wildlife.
- 3.7.5 Assuming that the wildlife populations can be restored, there is a requirement for Government assistance in establishing wildlife utilization projects. These represent a major first step towards developing a new industry, under the Wildlife Conservation Policy (1986). Such an industry will require the provision of access, storage, marketing and promotional facilities.

The Public Awareness Issue

- 3.7.6 Reference has already been made in this Section to the need for public awareness to be improved. In effect, this requirement applies both to all of the issues and to the NCS in general. Indeed, the scope both for improving the enforcement of existing legislation and for introducing new legislation is largely dependant

upon the introduction of a series of educational programmes. Such programmes are required for all sectors of the community, in order that renewable natural resources are not just consumed now. Public awareness about environmental issues needs to be raised significantly, so that conservation is achieved for the benefit of future as well as present generations. This applies to all aspects of the environment : physical and social, as well as economic aspects.

3.8 SPECIFIC OBJECTIVES

- 3.8.1 In concluding both this Section and Part One in general, it is appropriate to translate the general goals referred to in Section 1 into specific objectives. This applies particularly in the case of those features which are under greatest pressure.

Water Resources Objective

- 3.8.2 The objective is to ensure that the use (conservation and development) of both the renewable and non-renewable water resources is planned and executed, so as to achieve cost-effective, equitable and sustainable results.

Rangeland Pasture Resources Objective

- 3.8.3 The aim is to use grazing lands to sustain, within the stock carrying and regenerative capacities, economically viable livestock and wildlife sectors. It is hoped thereby to increase employment and income generating opportunities.

Wood Resources Objectives

- 3.8.4 The target is to match the supplies of wood resources, based on regeneration and new planting programmes, to the demands for consumption and productive purposes. This will be fulfilled in ways which are sustainable.

Veld Products Resources Objective

- 3.8.5 The objective is to achieve increased and sustainable use of veld products. The main aims will be to:
- a) generate economic opportunities as well as acceptable living standards; and
 - b) maintain the productive capacities of these environmental assets.

Environmental Protection and Enhancement Objective

- 3.8.6 The aim is to prevent and control pollution throughout Botswana, whilst at the same time enhancing the environment wherever development occurs. This entails a commitment to minimizing any negative effects

resulting from the use of natural resources, at least to acceptable standards. Thus, all sectors of the economy will be encouraged to undertake development in ways which are sensitive to the environment.

General Resource Conservation Objective

- 3.8.7 The objective is to conserve all renewable natural resources in the interests of development. Diversification of the economy away from land-based and other sensitive, natural resource-related activities is to be encouraged. In view of the increasing human population pressures, priority will be given to the development of industries, which make relatively small demands on the country's over-stretched natural resources : especially fossil water and some areas of rangeland.

P A R T T W O

THE STRATEGY MEASURES AND PACKAGES

SECTION 4 : THE STRATEGY FRAMEWORK : INDIVIDUAL MEASURES

4.1 INTRODUCTION

4.1.1 It is recognized that the five key issues call for a two part response from Government. First, there is a need to formulate the overall framework for the Strategy. Section 4 describes the Government's approach to this; especially concerning the choice of individual measures which offer the best opportunities of success. It represents the culmination of much discussion between Government and all interested parties. However, in order that the individual measures are effective, they need to be combined into 'solution packages'. This applies to each of the five issues. These 'packages' represent the second part of the response and are outlined subsequently in Section 5.

4.1.2 Thus, whilst Section 4 provides the general framework for the Strategy, the details follow in Section 5. There the Government's more specific intentions and proposals are described for each of the five key issues.

4.2 OPTIONS AND CHOICES

4.2.1 In addressing the five main issues, there are many tools at the disposal of the Government through which solutions can be sought. The Strategy, consisting of both guidelines and, where appropriate, specific solutions, has involved all participants, particularly all the sections of Central and Local Government. They have been involved in both identifying options and ultimately in making a series of choices between practical alternatives. These choices concern:

- a) the overall approach which Government should take in finalizing and implementing the Strategy;
- b) the main measures or individual 'building blocks' which should form the basis of the Strategy;
- c) priorities and time-scales.

4.2.2 The tasks of identifying options and making choices were greatly aided by the Technical Reports specially prepared for the NCS. These focussed on the macro-economic changes and innovations, the legal reforms, the educational initiatives, the research and demonstration activities, etc. which would most benefit Botswana's environment.

4.2.3 To-date the Government has intervened in the planning and use of natural resources through a variety of measures. These include gazettement, designation, planning procedures, laws, price incentives, fiscal measures, etc. The appropriateness of this

intervention, in contrast to the adoption of an entirely 'laissez faire' approach, is not in question. It is an approach, which in principle, is relevant to the needs of Botswana. The real questions concern whether or not and how an interventionist approach can be made to work more effectively in the interests of natural resource conservation and development. Intervention is usually most successful where it is achieved through a well conceived package of incentives as well as controls. It is clear to Government that the pursuit of the NCS goals could be achieved by adopting either any one of or different mixtures of three essentially interventionist strategy approaches. These are as follows:

first, the traditional resource use approach;
secondly, zoning approach to resource use;
thirdly, an integrated use approach.

4.2.4 The first of the three interventionist approaches involves allowing the forces of imperfect competition -- especially relating to the pricing of production inputs and outputs -- largely to determine which particular user interest/s dominate(s) the allocation of resources. This is one of the approaches currently adopted. Under it, the intervention price incentives and fiscal reliefs in effect determine which land uses dominate : livestock grazing and arable farming in the main.

4.2.5 The second approach is based on the concepts of 'reasonable rationing' and 'accommodation'. Such an approach involves making attempts to achieve a degree of compromise, albeit crudely, through negotiations based on acceptable 'trade-offs' between the various interests. Under this approach the demarcation of areas usually requires that each particular user interest must contain its activities within certain specified boundaries. This is another of the approaches partly adopted by Government at present, as manifest by the existence of well defined National Parks, Game Reserves and Forest Reserves, TGLP Ranches, Freehold and Leasehold Farms, Mixed Farming Areas and designated Wildlife Management Areas (WMAs). The approach is largely based on encouraging single-purpose resource uses (e.g. either farming or wildlife protection) within the respective areas. The exception is the WMAs. They were conceived as dual use areas, where priority would be given to wildlife utilization whilst accommodating low density livestock grazing and other forms of use, such as mixed farming.

4.2.6 The third approach is based on the multi-purpose (integrated) use and management of resources. In essence this approach wherever appropriate calls for dual or multiple use to be made of resources based on combinations of enterprises. Such combinations include cattle, wildlife, veld products and woodland management

for fuel, including charcoal and timber; arable crops, veld products and trees; forestry, veld products, craft industries and tourism services, etc. The approach also focusses upon trying to find ways of combining commercial and conservation interests. It is very different to the first approach, as it is based on the concept that both economic and ecological strength/safety lie in fostering diversity.

- 4.2.7 Some of the discussions leading up to the formulation of the NCS tended to concentrate attention on conflicts between livestock and wildlife interests. Polarization towards either livestock or game orientated policies is invariably counter-productive. It tends to lead to introverted planning. The results of this are likely to be sub-optimal, in terms of the use of natural resources and the levels of revenue and employment which can be generated. Thus, the need both to avoid and reconcile conflicts where possible, is appreciated. At the same time and in direct contrast, it is recognized that the adoption of an integrated approach to the use of resources has much to commend it.

4.3 SELECTION OF THE STRATEGY APPROACH

- 4.3.1 Selection of the NCS strategy approach cannot be made independently of Government policies, particularly those relating to the macro-economic matters. The third approach is geared to encouraging diversity. Its adoption, at least in part, would be consistent with a macro-economic policy orientated towards achieving a more open economy. This includes encouraging joint-venture projects, which are developed and sustained through participation by foreign investors.
- 4.3.2 Until now the conservation and development of natural resources within Botswana have been undertaken in the absence of an NCS. Nonetheless, they have been strongly influenced by a combination of the first two approaches outlined above. Just as in the past, a mixture of approaches has been adopted, so too a mixture - albeit different in composition - seems appropriate in formulating the NCS. Whereas the first and second approaches have dominated in the past, it is felt that all three approaches - particularly the third and second - are likely to be relevant in future. Where feasible, the third approach deserves increasing attention.
- 4.3.3 In adopting this mixed approach, the Government and all other interested parties recognize the importance of maintaining a strong livestock industry in Botswana. At the same time, in view of the overgrazing problem and the contribution which the agricultural sector has previously made in supporting the rural economy for many years, it is recognized that there is a strong case for diversification. The success of such diversification hinges upon:

- a) promoting and achieving co-existence between a range of resource use interests within an area; and
- b) thereby relieving the pressures on the livestock sector and thus the rangeland resources.

To succeed, this approach requires that great effort be devoted to developing market economies for resource uses additional to livestock grazing and crop production. For example, it calls for the development of both incentives and markets for those interested in producing one or more of the following: veld products; timber for fuel and/or construction; game and wildlife products; fish and possibly participating in the provision of tourist-cum-recreational facilities and services. The solution of the severe unemployment problem in rural areas lies in broadening the range of income generating enterprises, from which Botswana can realistically gain an acceptable livelihood. Indirectly the NCS is also committed to relieving this problem.

4.3.4

The importance of achieving diversification is well appreciated and is highlighted in sharp contrast by the dangers inherent in founding a rural economy upon a production base which is too narrow. History repeatedly demonstrates this lesson, as exemplified by the cotton growers of America, the milk and grain producers of Europe, the coffee farms of Columbia, Ethiopia, and Uganda. The Government of Botswana is thus strongly committed to strengthening its present diversification policies and programmes through the NCS. Indeed, the Government is impressed by the results of diversification in other rural economies. These have been achieved through adopting an integrated approach to the conservation and sustained development of natural resources. For example, the multi-purpose use of natural resources, in contrast to a single-purpose or monocultural approach, is proving successful in the Luangwa Valley and Lupande areas of Zambia; in various parts of Holland; in the Environmentally Sensitive Agricultural Areas of Britain; and in the Northern Areas of Pakistan, to mention but a few. These amply demonstrate that agricultural and conservation interests do not have to be in conflict. On the contrary, they can be compatible. They can and do co-exist, both at a policy level and under large scale integrated resource planning and management projects. Worldwide many examples of 'complete farms' exist where farmers derive income from a number of enterprises and also contribute additional benefits. The latter are associated with providing landscapes in which trees feature as:

- a) wind breaks;
- b) as sources of timber for fuel, fencing and buildings;
- c) as providers of fruit and wildlife habitat;

- d) as objects of beauty;
- e) as emblems of a cultural heritage.

The adjacent SADCC countries, as well as East Africa, Australia and Europe all contain such examples.

4.4 STRATEGY MEASURES : ENCCURAGING ECONOMIC DIVERSIFICATION

4.4.1 The Technical Reports prepared for the NCS, involving a review of Botswana's economy, reveal that there are many diversification opportunities, which can be sustainably developed through the integrated use of natural resources. These include: opportunities in the Arable Sector, related in particular to the irrigated production of vegetable crops. It is estimated that self-sufficiency, on a seasonal consumption basis, could be achieved through the adoption of intensive horticultural practices on less than 1000 hectares;

opportunities in the Forestry Sector through the preparation and execution of management plans for Botswana's native woodlands - both those which have been impoverished and those which are in reasonable condition. The inclusion of woodland areas as part of integrated community resource farm management schemes also offers the prospect of many benefits. In addition, the introduction of appropriate wood burning stoves will do much to improve the efficiency with which the wood resources of the country are utilized;

opportunities exist in the Fisheries Sector for increasing the annual sustainable harvest by up to ten times from the northern waters of the country, i.e. from 1,700 tonnes to in excess of 15,000 tonnes. In addition to the natural waters, there are some 250 man-made dams which would be suitable for fisheries development. It is unrealistic to think, however, that the potential of this industry will be achieved without further major Government intervention;

opportunities for establishing a wildlife utilization industry, and thereby for doubling the annual contribution of the Wildlife Sector to the economy in the next 10 years are considered to be feasible; quadrupling to some 90 million Pula in the longer term. Specifications and projects for harnessing these opportunities have emerged from detailed work undertaken by the Department of Wildlife and National Parks (DWNP) over the past two years (ref. Annex 1 : Figure 5). They have been supported in this both by the Kalahari Conservation Society and donor agencies. The assessment of this potential is based on extensive investigation of successful utilization enterprises throughout Southern and Eastern Africa. It confirms the view, expressed in the Government's Wildlife Conservation Policy, that the potential for commercial utilization of game products, even without an increase in offtake from the herds, is substantial. This

potential includes intensive farming operations (e.g. crocodiles and ostriches), game farming where game species are grazed in conjunction with cattle (in both fenced and communal areas) and game ranching where game species alone are grazed on an extensive basis. However, the potential for the last of the three components depends upon the successful recovery of game populations, following the devastating effects of the last drought;

opportunities for the sustained development of both existing and new veld products have been identified and confirmed through a series of technical/commercial research studies. There is clearly a promising commercial future for this sector, based on markets, for example, including phane, grapple plant, Gonometa (silk), Gonimbrania (protein), papyrus and Scelerocarya (medicine/wine). Successful development is considered to hinge in large part upon investment in marketing;

opportunities undoubtedly exist for expanding the Tourism Sector. These are thought to lie principally in the provision of facilities for distinct market sectors : high priced quality lodges for comfort/adventure searchers; medium-priced camps for adventure seekers; low cost hostels/camps particularly for youth groups; initially a few camps/hotels, for the operators of larger-scale package holidays. Potential exists for this provision to be extended into essentially new tourist areas, such as the Makgadikgadi Pans, the Central Kalahari Game Reserve, the Tsodilo Hills and the Gemsbok National Park. The adoption of measures which would enable Botswana to participate fully in the growth of the industry is important. This is regarded by the Government as an essential ingredient of any plans to realize these opportunities.

4.4.2 The Government recognizes that these opportunities are by no means exclusive. Whilst they will help to relieve the pressures on the natural resources used by the Livestock Sector, expansion of the latter itself is not precluded. Indeed, the restoration of degraded rangelands, once implemented on a significant scale, would enable the national herd initially to be sustained and subsequently to be increased. Both conventional restoration techniques and more particularly wildlife utilization/mixed grazing programmes have a role to play in achieving the necessary restoration. The potential for output improvements from the Tribal Grazing Land Policy (TGLP) ranches is considered to be significant. This view is reinforced by the World Bank. It has estimated that increases in offtake of up to 40 per cent could be achieved with no change in the size of the national herd.

4.4.3 Successful diversification calls for more than just rural initiatives based on the multiple (integrated)

use of renewable natural resources. The Government is already encouraging three other types of initiative involving the Minerals Sector, the Manufacturing and Related Industries Sector and an embryonic Financial Investment Services Sector. Each of these has a role to fulfil in formulating the framework for the NCS.

4.4.4 The role of exhaustible natural resources in achieving diversification is clearly a subject of vital importance in Botswana. This stems from the fact that nearly 50 per cent of the country's GNP emanates from the Mining Sector. Self-evidently, exhaustible resources from mining cannot be used sustainably; their consumption now reduces the stock for the future. In an economy where there are both substantial renewable resources and exhaustible resources, there is considerable scope for part of the mineral revenues to be invested in, for example, land rehabilitation and water supply. Through such transfers a more sustainable rural economy can be developed. Indeed, the Government of Botswana is already committed to a programme of investing exhaustible resource revenues in the renewable-based sectors.

4.4.5 The NCS Technical Report, prepared by the Ministry of Commerce and Industry, draws attention to the many diversification opportunities in developing the Manufacturing and Related Industries Sector. They involve agriculturally-based industries, manufacturing industries, the minerals industry and service industries. These opportunities also include several medium to larger scale projects which are expected to have 'downstream spin-offs' for the development/continuation of smaller rurally based industries. Examples are the Selibe-Phikwe Continuation project; the Sua Pan/Soda Ash project; a possible Coal Project in a location such as Mmambula; abattoir and rail projects; both private and community-based Wildlife Utilization projects. Whilst these and other largely urban-based opportunities for diversification look promising, it would be wrong to conclude that widespread results can be achieved at short notice. Indeed, through the findings of the National Conference on Strategies for Private Sector Development held in 1988, the Government is well aware of a number of serious constraints which need to be overcome before this sector can make a significant contribution to the NCS. The conference drew to the attention of Government the need for improvements concerning manpower, managerial, entrepreneurial and institutional arrangements.

4.4.6 The Financial/Investment Services Sector can also assist by providing the alternative investment outlets for many Botswana, who hitherto had little option but to invest in the livestock and arable sectors; particularly the former. The provision of stock brokerage and property development opportunities will

indirectly help to relieve the pressure on the country's rangelands. Moreover, they do not directly threaten the natural resources of the country.

- 4.4.7 In summary, it is increasingly acknowledged that both non-natural resource based industries and service sector activities can play a very important role in conserving and restoring Botswana's renewable natural resources. By developing a broader base to manufacturing and service industries, it may be possible to reduce somewhat the incentive to invest in assets such as livestock. This should assist in reducing rangeland degradation. By investing in urban and rural property development, environments become more attractive to investors whose location decisions are influenced, amongst other things, by the nature of the housing stock, by the aesthetics of the town and so on. Sustainability thus tends to imply diversification of the whole structure of the economy, not just the resource-based sectors. Through the National Conservation Strategy the Government confirms its full commitment to achieving diversification in a comprehensive manner.

4.5 STRATEGY MEASURES : ECONOMIC INCENTIVES AND DISINCENTIVES

- 4.5.1 The extent to which diversification into the sustainable development of new natural resource-based enterprises will succeed largely depends on the provision of attractive incentives and marketing aids. The Government is well aware of the complexities associated with providing incentives, which respectively on the one hand discourage over-utilization of natural resources and on the other stimulate sustainable development.

- 4.5.2 Six general types of incentives, which as a matter of priority should be used by Government in pursuit of the NCS goals, were collectively identified in the course of preparing the Technical Reports. These are:

First, incentives which promote good pasture management, including the adjustment of stocking densities to carrying capacities. These incentives will be geared specifically to achieving improvements in the quality of both rangelands and livestock herds;

Secondly, incentives which will encourage rangeland restoration;

Thirdly, a whole series of incentives to encourage economic diversification involving wildlife utilization, fishing, tourist services, veld products, forestry, shelter belt planting, etc.;

Fourthly, rural and urban environmental improvement incentives provided in the form of Annual Competition Award Schemes for farmers, villages/townships, industrialists, conservation committees, etc.;

Fifthly, incentives to encourage land tenure changes especially in communal grazing areas;

Sixthly, incentives to establish new forms of investment opportunities as alternatives to livestock, e.g. fixed interest securities.

As a matter of principle, Government favours the use of subsidies, grants and fiscal reliefs in very limited circumstances. Thus, attention will focus upon other forms of support.

4.5.3 The counter-part of these measures is a series of disincentives which would assist in improving the efficiency with which natural resources are used and managed. It is well recognized that disincentive interventions can be used to discourage over-utilization and mis-management of natural resources. Disincentives are known to have succeeded in furthering the conservation of natural resources in other countries. These include the levying of consumption charges to reflect the scarcity of a resource; the introduction of a management fee for stocking levels beyond specified thresholds; the elimination of tax concessions or the provision of fiscal measures; the application of environmental conditions or thresholds in the case of grants and subsidies; the fixing of producer prices which reflect environmental criteria, etc. Recommendations, concerning the need to give careful consideration to the introduction of such measures, feature in several of the NCS Technical Reports and aroused significant interest. Under the NCS the Government intends that the design of appropriate disincentives for possible use in conserving the country's natural resources should receive detailed investigation. It should be emphasized that such an investigation would not be confined to disincentives. Instead, it would focus on identifying the most appropriate packages of incentives as well as disincentives. At the same time, there is recognition of the need to guard against the introduction of any measures, which would damage the interests of small farmers.

4.5.4 The main tool used to encourage diversification away from three sectors (mining, livestock and the Government sectors) is the Financial Assistance Policy (FAP). This Policy applies to virtually all productive activities, except for the three sectors mentioned and dryland farming at a subsistence level and it has, for example, been successfully used for the development of projects covering horticulture, poultry farming, dairying, smallstock enterprises and irrigated farming. The Policy is continually being refined. It has thus recently begun to influence novel activities, such as agro-forestry, veld products (jam production), wildlife utilization (crocodiles) and craft industries.

- 4.5.5 The consultants responsible for preparing a Report on "The Evaluation of FAP and Its Role in Botswana Business Development" recommended that the Policy be extended to include the "productive" (e.g. tourist) component of the service sector. In principle, such an extension would be compatible with the aims of the NCS.
- 4.5.6 The Policy has yet to make substantial progress in aiding diversification into novel activities such as game farming, traditional hunting and veld product gathering. It is acknowledged that this will be overcome once it is possible to launch and sustain a major promotional programme throughout the country. In this respect, the provision of educational videos, for all sectors of the public, would make a substantial contribution. Such a programme needs to be combined with the provision of a District/Settlement-based extension service, operated specifically under the auspices of MCI. Together, with a strong promotional programme, this would go a long way towards increasing the FAP project portfolio and thus achieving significant diversification.
- 4.5.7 In short, the Government accepts the need to investigate and develop both economic incentives and disincentives, in the interests of achieving the NCS goals.

4.6 STRATEGY MEASURES : LEGISLATIVE REFORMS AND PROVISIONS

- 4.6.1 It is widely acknowledged that environmental legislation can play an important role both in addressing most of the key issues and supporting diversification initiatives. A special review of the environmental provisions of existing legislation has been undertaken on behalf of the Government in the course of preparing the Strategy. This has confirmed that although Botswana is, in a general sense, relatively well endowed with environmental legislation, there are nonetheless serious shortfalls in terms of enforcement, coverage and institutional coordination. At present the responsibilities for legal enforcement are widely dispersed between Government institutions. As a result, it is recognized that under the NCS, three types of action are likely to be helpful: the enforcement of existing legislation; the amendment of existing legislation; and the provision of new laws. These are described in the sections which follow and are supported by Government in principle. However, it is acknowledged that there is a limit to the improvements which can be achieved through legislation of any type in the short-term. Too much reliance upon legislation is regarded as not being helpful. Instead, higher priority, it is considered, needs to be accorded to persuading and encouraging the public to act in ways which are environmentally benign. This is best achieved through a combination of educational and associated measures.

Enforcement of Existing Legislation

- 4.6.2 There is general agreement that enforcement is an item which calls for attention. This applies particularly in respect of the use of conservation and stock control orders, under the Agricultural Resources Conservation Act, and in relation to the poaching of wildlife, under the Fauna Conservation and National Parks Acts. However, achieving significant improvements is known to be difficult, since it involves changes in traditional values throughout Botswana society. It is acknowledged that the deterrent effect of criminal penalties is, for example, diluted by the general unwillingness of both the Botswana community and the courts to recognize that damage to the environment constitutes a true and serious crime. The social acceptability of law in general, and of environmental law in particular, is limited by the fact that, in essence, it represents an imposition of external values. For this reason a collection of measures is proposed for improving the contribution which legislative tools can make under the Strategy. These include:
- a) educating all members of the public about the Government's objectives, as well as the moral and social justification for the legislation;
 - b) communicating reminders, amendments and additions to the law with the help of the mass media;
 - c) devising a comprehensive and effective system for making, communicating, implementing and reviewing environmental laws;
 - d) strengthening the institutional arrangements for enforcement and particularly providing for the coordination of environmental responsibilities;
 - e) treating environmental conservation and natural resource utilization 'on a par';
 - f) improving the penal sanctions for 'law breakers', so that punishments fit the offenses;
 - g) encouraging local NGO's, especially those operating in the Districts, to assist in ensuring that environmental laws are both respected and effectively implemented;
 - h) providing viable alternatives to the prohibited activities, e.g. community-based wildlife utilization projects;
 - i) introducing specific incentives which reward those groups or individuals who comply with, for example, environmental standards (effluent discharges), stocking rates or erosion control measures. Such incentives are known to have worked well in other countries.

It is recognized that a comprehensive package of initiatives is required to improve legal enforcement. Collectively, the measures outlined above represent such a package.

- 4.6.3 The Government appreciates the outcome of the legislative review undertaken for the NCS and, in particular, the need for more resources to be made available in support of the nine enforcement improvement measures listed above. These additional resources are needed especially for increasing the expertise and number of 'law enforcers', for improving the supervision of licensing arrangements and for raising public awareness.

Amendments to Existing Legislation

- 4.6.4 The legislative review revealed that substantive changes are required to the country's environmental laws; particularly with regard to substituting detailed provisions in place of broad generalities and to ensuring that the many components of environmental law are effectively coordinated. The overall aim is to ensure that the existing laws are both positive and helpful in conserving and improving Botswana's environment.

- 4.6.5 Examples of proposed amendments include:

- i provision under the Forest Act for replanting, so as to replace trees which have been felled;
- ii prescriptions under the Acts which protect vegetation against the use of potentially harmful substances;
- iii repeal of both the National Parks Act and the Fauna Conservation Act and replacement with a single statute, in which the provisions of both could be coordinated more closely;
- iv provision of a cohesive legislative code for administration by local Government authorities, relating specifically to the management of wastes; such a code to distinguish between hazardous and non-hazardous wastes;
- v amendment of appropriate laws, so as to cover misuses of fertilizers, herbicides, insecticides and other chemicals which are potentially dangerous to human health;
- vi extension of the Water Act to protect water resources in their natural state against pollution and to provide mechanisms for regulating institutional effluent discharges into public waters;
- vii broadening the Atmospheric Pollution (Prevention) Act beyond industrial premises to include all sources of atmospheric pollution;

- viii introducing under the Tribal Land Act, following appropriate investigation, a more practicable way of achieving a system of dual grazing rights. This would include consideration of measures for confining all livestock kept on both TGLP and privately owned ranches specifically to the ranches. All such livestock would thus be excluded from the communal lands. It would not however, affect the rights of ranchers to graze other livestock in the communal areas. (This matter is recognized to be particularly sensitive, and legislation is known to be particularly difficult to implement, at least in the short-term.);
- ix encouraging under the Agricultural Resources Act, the Agricultural Resources Board, MOA, DWA and MLGL to cooperate closely with the Land Boards. The Land Boards would be strengthened, at the same time, to discharge their responsibilities in:
- a) controlling the allocation of grazing lands and arable land; prescribing stock numbers; administering water rights; and generally ensuring compliance;
 - b) zoning and gazetting grazing and fallow lands in all Districts;
 - c) providing communities, in certain circumstances, with both exclusive rights over defined areas of communal grazing land and the legal right to enforce sustainable grazing practices.

Under the Strategy, it is the Government's intention that due consideration shall be given to these and all other legislative amendments, proposed in support of the NCS goals.

In this context, it is significant that the Ministry of Mineral Resources and Water Affairs is already engaged in reviewing all Acts which have a bearing upon both pollution control and prevention.

Introduction of New Legislation

- 4.6.6 After careful consideration, the Government intends to introduce an Act, the NCS Act, specifically in support of the Strategy. The need for such an Act derives directly from the importance of four factors:

first, providing a comprehensive policy framework for the NCS and through it a vehicle for coordinating all existing policies and subsequent legislation, which relate to the NCS goals and objectives;

secondly, defining the responsibilities of all those organizations, upon which the success of the NCS depends, specifically including a clause stating that

individually and collectively they shall have due regard in all aspects of their work for the conservation and sustainable development of natural resources;

thirdly, making the preparation of both Environmental Impact Assessments (EIA) and associated Statements mandatory for all public and private developers, in respect of scheduled classes of development projects and actions. This, like other proposed legislative innovations should, as far as possible, be based on the 'polluter/user pays principle'. Many EIA's have been prepared, including the Kolobeng and Metsemotlhaba Dams Project. However, to date there has been no formal requirement for the preparation of EIA's. In future, preparation should become part of the formal planning approval process;

fourthly, establishing an enabling framework for both the provision and coordination of the legal, institutional, manpower and monetary resources required for the effective implementation of the NCS.

4.6.7 It is intended that there should be two important general provisions under the proposed Act:

first, the coordination of existing Government policies, as they impinge on NCS matters, and

secondly, the establishment of mechanisms for helping to resolve future resource use conflicts should be important general provisions under the proposed Act.

4.6.8 There is general recognition of the need to equip properly those sections of the Civil Service, which will be responsible for administering the EIA procedures. Adequate numbers of staff, experienced in the specialized preparation, evaluation and monitoring activities involved, will be required.

4.7 STRATEGY MEASURES : PLANNING AND ADMINISTRATIVE MEASURES

4.7.1 In view of the extent of Botswana's natural resources and the complex linkages associated with their wise use, it is inevitable that improvements in planning and administrative procedures are required under the Strategy. Two specific improvements are envisaged.

4.7.2 The first concerns the need to consider adjustments to the planning process, so that full recognition is given to the ecological zones of Botswana. The rationale for this is sound on economic and social, as well as environmental, grounds. Since a major part of the true cost of natural resource-based activities lies in their external or inter-sectoral effects, the optimal basis for development planning should be ecological zones. These zones are characterized by both high levels of environmental linkage and compatible resource-based economic activities.

4.7.3 The present District Land Use Planning Units, whilst serving administrative needs, cut across ecological zones. Thus, in future, it is important that ways should be found of accommodating ecological needs in the planning process. Already both Central and Local Government have shown themselves to be supportive in this respect. As an initial step an ecological zoning study of the Okavango Delta has been undertaken, in order to assist planning, primarily within Ngamiland District but also in adjacent Districts. In view of the general acclaim which this study received, there are strong grounds for extending the process to other Districts. As a result, inter-District resource planning activities, which are so important, would be assisted.

4.7.4 In order that planning procedures, based on ecological zoning, are successful, a good data base covering all natural resources is required. Government recognizes that currently such a data base does not exist for the whole country. It is thus committed to ensuring that this deficiency is rectified as a matter of priority under the NCS Action Plan.

4.7.5 The second improvement concerns the drafting of detailed regulations required in support of both new policies and legislation. There is general consensus that greater priority and resources need to be allocated to this task, so that, in future, Government's decisions become effective much more quickly. The implementation of one policy which would have benefitted from such administrative improvements is the 1986 Wildlife Conservation Policy.

4.8 STRATEGY MEASURES : PUBLIC AWARENESS, IMPROVED EDUCATIONAL, TRAINING AND RESEARCH MEASURES

4.8.1 Throughout the preparation of the Strategy, much stress was placed upon the role of improved educational, training, research, demonstration and extension facilities in achieving the NCS goals. Background Technical Reports to this end were prepared by several Ministries : Ministry of Education, Ministry of Home Affairs, MLGL and MOA.

4.8.2 The main recommendations which emerged from the consultations have received a wide measure of agreement between the Government organizations involved. Those, on which there is general consensus and which will thus receive general support under the Strategy, are summarized below.

Formal Education Improvements

4.8.3 There is widespread support for the proposal that conservation education should be introduced into both the School and Teacher Training College curricula. The aim of this is to establish amongst all schools a

caring attitude towards the environment for the benefit of present and future generations. This underlines the need for the objectives of the Ministry of Education, concerning environmental education, to be more clearly defined.

- 4.8.4 Consistent with this, there is general agreement that the spectrum of teaching methods used should be significantly broadened. This is recommended in the interests of stimulating much greater awareness, particularly about the practical aspects of conservation and sustainable development.

Non-Formal Education Improvements

- 4.8.5 There is a generally acknowledged need for the main goals and target audiences to be defined in the case of non-formal environmental education. Educational programmes for specific environmental improvements, involving, for example, tree planting schemes and anti-litter campaigns require careful identification and planning. However it is considered that, on their own, educational programmes and campaigns will not be sufficient to cure the litter problem. Indeed, there is growing support for the view that rectification of the problem will, in addition, require very strong legislative sanction, backed by effective incentives/disincentives. The local authorities will need both to co-ordinate and direct the necessary inspection and enforcement procedures.
- 4.8.6 Careful coordination of the educational activities of all NGO's and other interested parties is required on an inter-sectoral basis. Such initiatives will be welcomed by Government; likewise those which ensure that the methods, adopted for disseminating conservation information to the general public, cover all media and audio-visual aids.
- 4.8.7 It is generally accepted by Government that additional resources need to be made available to implement the improvements recommended for the non-formal education sector.

Training and Group Participation Improvements

- 4.8.8 Significant, additional training facilities are required to equip the professional, technical and administrative staff required for implementation of the NCS. These needs in all fields of natural resource planning, management and monitoring are well recognized. Steps to meet these needs have already been initiated by the University of Botswana and associated training establishments, e.g. at the Wildlife Training College in Maun. However, much more training remains to be done. The Government is firmly committed to the achievement of this.

- 4.8.9 In the wider field, the needs for several improvements have also been identified. These include:
- a) the initiation of a group leadership training programme in conservation and development; and
 - b) the creation of specific opportunities for both youth and women's groups to participate in the NCS implementation.
- 4.8.10 The provision of financial support for these improvements, on at least a 'seed basis', is well recognized by Government as being a priority need.

Research, Demonstration and Extension Improvements

- 4.8.11 The background NCS Technical Reports clearly established the need for two essential research activities in support of the Strategy:

first, the preparation of a comprehensive inventory of past and present research, covering all aspects of Botswana's environment;

secondly, the establishment of a research and development strategy, specifically in support of the NCS goals. This is vitally important if the scope for economic diversification, particularly concerning commercially viable veld product enterprises, is to be realised.

- 4.8.12 In addition, there are a number of important applications of past research which call for demonstration and implementation. Of the five issues, the need for such activities is particularly relevant in addressing the problems of overgrazing and woodland depletion. The need for demonstration is also strong in disseminating the results of successful diversification enterprises. These already exist in the case of fishing, veld products, and craft industries, forestry, and tourism. The Government is committed to increasing the resources made available in support of such activities, as evidenced by the changes associated with reorganization of the Agricultural Resource Board. These include the establishment of a new cadre of extension officers to cover conservation. In this respect the portents for successful implementation of the Strategy are promising.

4.9 IMPLEMENTATION OF THE STRATEGY APPROACH

- 4.9.1 In seeking to combine and thus effectively harness these various main measures as a series of "solution packages" in support of the Strategy, Government is committed to achieving and maintaining the following in particular:

- a) a diversity of economic, biological and social opportunities whilst retaining existing strengths, e.g. the cattle industry;
- b) the integrated or multiple use and management of natural and associated human resources, wherever possible;
- c) the full consultation and participation of all sectors of society (Central and Local Government, NGO's, private industrial and property interests, educational establishments, etc.) in the preparation and implementation of development-cum-conservation schemes. Such participation will be sought on a voluntary basis by persuasion rather than imposition;
- d) a mixture of effective incentives and controls;
- e) the improvement of the professional skills of all personnel and organizations which will be involved in carrying forward the NCS and its Action Plan. Particular importance will be attached to professional training associated with the development of new institutional arrangements and the strengthening of inter-Ministerial cooperation;
- f) the demonstration of novel resource use and management opportunities which offer scope for increasing revenue earnings and employment;
- g) the provision of extension services so that they are directed towards harnessing opportunities for the sustained development, and thus conservation, of all natural resources;
- h) the creation of new investment opportunities in Botswana for private sector interests.

4.9.2 At the same time it is recognized that the Strategy should be both anticipatory and cross-sectoral. Thus it anticipates the requirement for food security; pollution control; high quality living conditions; optimal use of resources in determining settlement patterns, transport and energy systems, trading arrangements and modes of consumption.

4.9.3 Similarly, the Government is committed to ensuring that both its existing and proposed policies and programmes (e.g. FAP, ALDEP, ARAP, TGLP, the Wildlife Conservation Policy, the Tourism Policy, etc.), are/will be consistent with the goals of the NCS. Thus establishing and maintaining the complimentary nature of the NCS is regarded as a matter of high priority. This applies particularly in the case of the NDP and its associated processes. Indeed, administratively this relationship is essential to the long-term success of the Strategy.

4.9.4 In summary, the Strategy approach adopted by Government seeks to achieve integration; to encourage a mix of creative and preventive measures; and to involve all sectors.

SECTION 5 : STRATEGY FOR GOVERNMENT ACTION - INDIVIDUAL ISSUES

5.1 INTRODUCTION

- 5.1.1 Due to the complexity of both the main environmental issues and to the many opportunities which exist for sustainable development, it is recognized that on their own none of the individual measures, described in Section 4, is likely to succeed. Instead, there is general consensus that the Strategy should focus on the most appropriate 'solution packages'.
- 5.1.2 This Section presents and explains the 'solution packages' which Government proposes to adopt for each of the five key issues and the wildlife conservation issue previously outlined in Section 3. In devising these packages the following factors received primary consideration:
- a) the acceptability of the solutions to the prime target groups;
 - b) the proven technical and financial feasibility of the solutions;
 - c) the existence of institutional capacities required for effective implementation;
 - d) the need to establish incentives, which will make the results of diversification into new rural enterprises as financially attractive as those obtained from livestock and arable production.

5.2 ISSUE A : PRESSURE ON WATER RESOURCES

- 5.2.1 Since this is an issue which influences the use of many other natural resources and thus the performance of many different sectors of the national economy, the solution package devised for the NCS is necessarily wide-ranging. It consists of a combination of individual Strategy components, outlined below. First, however, reference needs to be made to one ingredient of overriding importance. That is the formulation of a National Water Master Plan. This has already been initiated by Government as a matter of high priority. In accordance with the wishes of all those consulted, the Master Plan will provide a framework for coordinating the conservation and development of all water resources, whilst at the same time retaining flexibility which is necessary for initiating innovations. Thus the Master Plan will form one of the essential cornerstones for the NCS and its implementation.

Planning and Administration

- 5.2.2 Because the institutional responsibilities for water resources are fragmented, it is important that careful consideration should be given to the possibility of coordinating responsibilities under a single authority. This will receive attention from Government as part of

the work entailed in preparing the National Water Master Plan. The potential benefits which such co-ordination offers are many. They include the following:

- a) improved protection of water resources against pollution and mismanagement;
 - b) increased use of water management techniques for multiple purposes, thereby assisting the achievement of other conservation goals.
- 5.2.3 Of particular importance in improving planning and administrative measures, is the help which these will bring to conserving the country's major surface waters and associated natural resources of international fame.

Economic Incentives and Disincentives

- 5.2.4 The use of economic instruments in support of conserving water resources in a country, where income levels vary greatly, is recognized to present many problems. In theory, there is a good case for extending the system of water rates, which is presently operated in urban areas by the Water Utilities Corporation to all consumers in Botswana. However, in practice, this may need to be introduced into rural areas gradually.
- 5.2.5 A second economic tool which would almost certainly be easier to implement in the short-term and be of assistance to the NCS would be an incentive to encourage the collection of rain water. This would almost certainly be easier to implement than the first measure.

Legislative Reforms and Provisions

- 5.2.6 Reference has already been made to recognition of the need to amend and add to the Water Act. Review of the legal machinery governing the use of water resources will help to identify the scope which exists for a number of improvements. These include diverse measures, such as moving towards nationalizing supplies and strengthening the provisions for aquatic weed control.
- 5.2.7 The proposed NCS Act will enable the Government to formalize the adoption of EIA methods as an essential part of the procedures for evaluating all potential new water supply and pricing schemes.

Educational, Training and Research Measures

- 5.2.8 There is widespread support for the Government to initiate a major public education programme. This should be geared to improving awareness of the importance of conserving water resources in both

sustaining and developing the wide variety of other resource uses which they support, e.g. agriculture, fishing, tourism, etc.

- 5.2.9 Inevitably, there are proposals that, in future, greater resources should be committed to research. In formulating the National Water Master Plan the Government has been asked to address a number of priority topics, which will form inputs to the Plan. These inputs include studies of:
- a) groundwater resources (quantitative and qualitative aspects) and recharge rates;
 - b) rainfall harvesting and water storage methods;
 - c) techniques for the prevention or reduction of evaporation;
 - d) recycling of treated effluent;
 - e) pollution prevention methods;
 - f) the scope for achieving inter-regional water transfers, which are both cost-effective and environmentally acceptable.

Implementation

- 5.2.10 The Government is committed to implementing those elements of the proposed solution package, which offer the best prospects for achieving the NCS goals in the foreseeable future.

5.3 ISSUE B : RANGELAND PASTURE DEGRADATION

- 5.3.1 Of all the issues this is recognized to be the one which is the hardest to resolve. In relation to that degradation which is caused by the overstocking of livestock, the solutions have generally been well known for a considerable time. However, many of them run counter both to traditional customs and to the rights of Batswana under the Constitution. Progress in implementing such solutions is likely to be slow. Nonetheless, they are included as part of the overall package, since Government is, in principle, committed to solving the problem in the longer-term. In the short to medium-term the Government expects to achieve as much progress indirectly, through both diversifying the use of natural resources and creating alternative investment opportunities for farmers, as by the direct measures described below.
- 5.3.2 Through addressing the issue both directly and obliquely, it is intended to achieve two improvements. The first is to reduce the pressures on the rangeland from livestock grazing. The second, where appropriate, especially in areas where cattle numbers are either low or non-existent, is to generate economic benefits from wildlife utilization. Thus, the paragraphs which follow describe the packages proposed for reducing overgrazing on the one hand and for improving wildlife utilization on the other.

Planning and Administrative Measures to Reduce Overgrazing

5.3.3 There is general consensus that a number of initiatives are required. These include:

- a) increasing the strength of the Range Ecology Unit within the Ministry of Agriculture. Initial steps towards this are already being taken. These will enable the important monitoring and advisory activities of the Unit to be undertaken in accordance with the recommendations made in the report, on "Re-establishment of a National Range Resource Assessment and Monitoring Programme". This was commissioned by the Ministry of Agriculture and subsequently accepted by Government in 1988;
- b) extending the zoning and gazetting of land for use by livestock and wildlife on the basis of the following four categories: grazing areas with priority for livestock; mixed farming areas with grazing for livestock; national parks and game reserves for wildlife; and wildlife management areas with priority for wildlife;
- c) developing a comprehensive water supply policy for all forms of livestock and wildlife, covering such items as:
 - . the distance between water points;
 - . the regulation of livestock number per water point;
 - . the charging of fees for actual water use (even if boreholes are privately owned);
 - . the provision of access to, and ownership of, water points;
 - . the provision for additional water points (boreholes, dams, etc.), based on carefully established needs.
- d) improving the provision of information to farmers concerning the carrying capacities of the range, in accordance with the recommendation in the Range Monitoring Report, commissioned by MOA.

5.3.4 There is also some support for strengthening the efforts initiated by the Ministry of Agriculture towards encouraging community based resource management schemes. This involves vesting increased management responsibility in the local communities, with Government involvement focussing more on the provision of technical/marketing support services and financial and other incentives. However, experience to-date with cooperative schemes suggests that much greater progress in overcoming overgrazing is likely to be achieved through adopting a long-term policy of land privatization. At this stage and until further investigations have been carried out, Government is reluctant to give any undertaking on solutions entailing changes in land tenure.

Economic Incentives and Disincentives

- 5.3.5 Several incentives are proposed both to reduce overgrazing and to restore the rangeland degradation which has already occurred. These include the following measures:
- a) introducing price or income incentives to encourage farmers to adjust seasonal and annual stocking rates in line with the current carrying capacities;
 - b) providing assistance to farmers in specific areas both to prevent and reverse bush encroachment, blackthorn (*Acacia mellifera* subsp. *detinens*) in particular. This will be through the use of labour intensive (basal bush burning) schemes. To the extent that voluntary destocking is required as part of targeted rangeland restoration programmes, conditional compensation will need to be arranged by Government;
 - c) redirecting expansion investment away from livestock enterprises to other sectors;
 - d) adjusting and improving price/marketing systems, so that farmers are encouraged to sell lower grade annuals, to increase off-takes at the onset of the dry season, etc;
 - e) providing re-stocking loans, once degraded rangeland pastures have been successfully restored. These will be conditional upon the continuing adoption of sound management practices.

Under the NCS, the Government undertakes to pursue these proposals with a view to adopting those, which, following further investigation, are found to offer the best prospects.

Legislative Reforms and Provisions

- 5.3.6 Again, these measures are likely to continue to give rise to complications. Continued attention will be paid to finding politically acceptable ways of introducing measures which will lead to (better) enforcement of the Tribal Land Act and the Agricultural Resources Conservation Act. In part, this will be achieved by strengthening the Land Boards. The provision of professional and technical advisers in support of the Land Boards is recognized to be a crucial step forward.
- 5.3.7 Attempts will continue to be made to devise legislation which leads to improved management of all freehold, leasehold and State lands.

Educational, Training and Research Measures

- 5.3.8 As part of an overall 'solution package', an educational campaign needs to be introduced to raise

awareness of the problems and solutions, covering:

- a) the value and finite supplies of the natural resources involved, i.e. land, livestock and wildlife;
- b) the need for better management practices;
- c) the marketing channels available for livestock and wildlife.

5.3.9 Efforts in training farmers in livestock/rangeland management techniques need to be intensified, in the interests of both improving the national herd and increasing the off-take ratio. As part of rangeland regeneration programmes, it is recommended that farmers be encouraged to utilize the by-products from bush clearance for fuel; either as wood or charcoal.

5.3.10 During the consultations leading up to preparation of the NCS, general support has been expressed for the recommendation that research, development and extension initiatives should be extended:

- a) to improve/restore rangeland pastures;
- b) to establish pilot projects which demonstrate the benefits of multiple land use practices involving cattle and wildlife; and
- c) to identify the scope for adopting more intensive management practices, including fodder production.

Wildlife Conservation and Utilization

5.3.11 Considerable progress is being made by Government both to investigate and realize the potential for establishing wildlife utilization projects. This applies particularly to those which will directly benefit local communities. There is increasing recognition that some game species, which browse, can help in making degraded rangeland more productive. This is essentially due to their browsing habits. These game species can also contribute to the arrest of degradation by limiting the encroachment of bush, which is itself encouraged by degradation.

5.3.12 The need to establish the infrastructure (access, storage, veterinary and related facilities) as well as the marketing arrangements (markets, pricing structure, advertising, etc.) in support of wildlife utilization schemes is appreciated. Appropriate steps are being taken by Government and will receive further support under the NCS.

5.4 ISSUE C : DEPLETION OF WOOD RESOURCES

5.4.1 In sharp contrast to the overgrazing issue, the solution package for overcoming woodland resource depletion is less exacting. Nevertheless, in combination, the measures proposed are far ranging. The Government intends as a matter of priority to

monitor the success of these proposed solution measures, both individually and, more particularly, as a package.

Planning and Administrative Measures

- 5.4.2 In recognition of both the potential importance and expansion of the Forestry Sector, the Government intends both to up-date its Forestry Policy and, most importantly, to provide a comprehensive National Forestry Management Plan in support of the Policy. The purpose of both exercises will be threefold, namely:
- i to improve the conservation/management of existing resources;
 - ii to establish additional woodland areas; and
 - iii to develop a Forestry Industry in Botswana, which will not only substantially reduce timber imports but create increased contributions to both GNP and employment within Botswana.
- 5.4.3 Great importance is attached to ensuring that each community has good access to 'in situ' woodland resources, which are capable of meeting its fuel and timber needs on a sustained basis. This will require:
- a) the preparation of detailed timber resource management plans for each settlement;
 - b) the education of local communities in all aspects of silviculture. Underlying this is the need for improved woodland management and rangeland management to be accorded equal importance;
 - c) the establishment of pilot woodland management projects on a community basis, in those areas where cooperation is likely to be greatest and where depletion of resources has been heaviest. Such projects will address issues such as regulation for harvesting, rights of outsiders to collect wood, charges for commercial use, etc.;
 - d) close collaboration between the Government, the Forestry Association of Botswana, and all other interested parties;
 - e) the provision of expert technical assistance from appropriate sources as necessary.

Economic Incentives and Disincentives

- 5.4.4 Consistent with these objectives and initiatives, the Government intends to commission a study investigating the roles which financial incentives and other forms of Government assistance should fulfil in conserving and managing timber resources. This study will include the

incentives required to assist the effective establishment and management of:

- a) windbreaks, live fences containing trees, and woodlots in agricultural areas; and
- b) amenity tree plantations within and around settlements, covering both rural and urban areas.

In this context the Government notes the intention of the MOA to discontinue the destumping programme under ARAP.

5.4.5 In order to implement these proposals the Government is considering establishment of a multi-sectoral Forest Advisory Committee. Representatives of Government, NGO's, the University/Research organizations and the private sector will be invited to serve on this Committee. The Committee will be directly responsible to the Ministries of Agriculture and of Mineral Resources and Water Affairs.

5.4.6 In areas where wood shortages are most serious, Government will encourage the use of wood substitutes. A national investigation into the best means for assisting communities to make the necessary substitutions will be commissioned. The possible use of subsidies will be included in the investigation. The case for including subsidies in such investigations can only be made in relation to clearly defined sectors of the community, i.e. open-ended subsidies will not be entertained. Wherever feasible and as a demonstration of its strong commitment to solving environmental problems, the Government will seek to ensure that all urban institutions for which it is directly responsible, will switch from wood to coal or other energy sources as soon as possible.

Legislative Reforms and Provisions

5.4.7 The Government attaches such importance to the restoration and conservation of a healthy and effective tree cover, in and around settlements, that it proposes to amend the Forest and Agricultural Resources Conservation Acts to make the replanting and associated protection of trees a mandatory responsibility for all communities throughout Botswana. Replanting programmes will be administered by the District Authorities. Again, the Government will seek the help of the Forestry Association of Botswana to achieve its ends.

Educational, Training and Research Measures

5.4.8 Government will both procure and allocate the resources required to:

- a) train forestry extension staff;
- b) increase the supply of skilled forestry personnel.

This is recognized to be essential before undertaking a country-wide educational campaign. Such a campaign should cover all forms of trees and their management, including the merits of wind-breaks, woodlots and agro-forestry; the use of alternative sources of fuel, etc.

- 5.4.9 Additional forestry and related research will be commissioned by Government. This will focus on such priority subjects as the comparative performances of species; the cost-effectiveness of alternative wood substitutes/domestic energy systems; and the integration of forestry into farming systems.

5.5 ISSUE D : OVERUSE OF VELD PRODUCTS

- 5.5.1 As part of its programme encouraging economic diversification in rural areas, the Government intends to foster the sustained development of a veld products industry. The private sector will be encouraged to invest in commercial cultivation of an increasing number of selected veld products. This is reflected in the package of measures described below. Efforts will be made to concentrate commercial production into specific farm or plantation areas, specially licenced for the purpose by the Land Boards. One aim will be to ensure that the licence revenues are used to finance both the regeneration of depleted veld product stocks and improved enforcement measures. The intention will also be to enable subsistence uses of veld products - so long as they are sustainable - to continue around settlements without interference from commercial activities. To these ends, close cooperation with Thusano Lefatsheng, other NGO's and commercial companies will be maintained and developed. Special attention will be paid to investigating the measures required to commercialize the production, processing, marketing, etc., of particular veld products, which are considered to have the greatest potential. Initially, these will be selected from a list of approximately 150 species which were researched under the auspices of MCI in 1981.

- 5.5.2 Government, for many reasons and not least the considerable potential for developing a veld product industry on a sustainable basis, is committed to ensuring that this package of measures will achieve the desired results.

Planning and Administrative Measures

- 5.5.3 As with wood use, special attention will be paid to incorporating the collection of veld products explicitly into rural development plans.

Economic Incentives and Disincentives

- 5.5.4 Where or whenever serious depletion of veld products exists or occurs, Government will seek to ensure that

communities have access to substitute products. If necessary the latter will be subsidized.

- 5.5.5 The introduction of price incentives and capital grants will be investigated for the commercialization of new veld products.

Legislative Reforms and Provisions

- 5.5.6 Strenuous efforts will continue to be made to ensure that, under the Agricultural Resources Conservation Act, veld products are not exploited. The same legislation will be harnessed both to protect and to restore stocks which have been seriously depleted.
- 5.5.7 The need to amend legislation, in the interests of conserving rare and potentially threatened plants, is appreciated by Government.

Educational, Training and Research Measures

- 5.5.8 Government, through the MOE and with the support of the NGO's as well as private sector interests, will initiate an educational campaign, supported by research, in order to advise the public on:
- a) the values and limited availabilities of specific veld products;
 - b) harvesting techniques and methods of use which are effective;
 - c) storage and processing possibilities;
 - d) the scope for undertaking/participating in regeneration and commercial cultivation projects;
 - e) the use of substitutes.

As in the case of the other key issues, the improvement of public awareness is considered to be a top priority.

5.6 ISSUE E : INDUSTRIAL/URBAN POLLUTION AND THE ENHANCEMENT OF SETTLEMENTS

- 5.6.1 The Government proposes the introduction of a package of measures for the conservation of those natural resources, which are in jeopardy through the development of industries and settlements. This package is purposely broad-based to include measures specifically designed to enhance the landscapes and facilities of all settlements. The main proposals are summarized below under the headings of the individual measures.

Planning and Incentive Measures

- 5.6.2 As a matter of priority, Government intends to investigate the scope for establishing one or more

waste processing factories, in the interests of recycling materials. As part of this, consideration will be given to providing incentives for the return of 'waste' materials to communal collection points (e.g. 1-2 thebe per beer can).

Legislative Measures to Enhance the Environment

- 5.6.3 All aspects of the Town and Country Planning Act will be enforced to ensure:
- a) the improved provision, design and management of human settlements, including public open space and recreational facilities;
 - b) the conservation of natural resources within the planning areas of all settlements.

Legislative Additions and Amendments

- 5.6.4 The additions and amendments required to provide improved protection of the environment against pollution in urban, and rural areas, include:
- a) introducing legislation, under an NCS Act, which makes it mandatory for all those responsible for any environmentally significant development to prepare an approved Environmental Impact Assessment (EIA) before gaining planning consent. Under this Act, the developer, together with the Government pollution control officers, will be responsible for regular monitoring, so as to ensure that there is full compliance with all environmental conditions.
 - b) amending all existing legislation to ensure that:
 - . it is based on the 'polluter pays principle';
 - . the issue of all permissions, licences, consents, etc., is withheld until the specified actions, associated with the reclamation of sites, disposal of wastes, industrial discharges, etc., resulting from existing industrial operations, have been met in full. It is intended that such legislative amendments shall be retrospective, so as to include all industrial/development permissions previously granted.
 - c) effecting compulsory registration of all potentially polluting activities, including the import and export of chemicals. This will be under the care of those Government organizations responsible for implementing the EIA procedures. The Government intends to make full use of international data bases, such as the International Register for Potentially Toxic Chemicals, and to support the introduction of "prior informed consent" for the import and export of such chemicals;

- d) establishing rigorous controls over the siting and use of dumps for the disposal of hazardous wastes;
- e) extending the standards established for the quality of all gaseous, liquid and solid emissions/wastes associated with settlements and industrial processes. In this respect, there will be close cooperation with SADCC to minimize the regional risks of potentially harmful enterprises being wrongly located.
- f) strengthening the Atmospheric Pollution (Control) Act to cover emissions of waste from mobile services; to prescribe emission values and ambient air quality standards; and to include monitoring of industrial process certificates;
- g) strengthening the provisions in the Water Act both against pollution of public waters, including all groundwater; and especially regulating discharges into public waters through a system of conditional consents;
- h) strengthening the Public Health Act to cover protection against all pollutants;
- i) providing a comprehensive legislative code for the management of wastes by local Government authorities. This will be done through a system of licensing and controlling disposal sites for specific wastes, distinguishing between hazardous waste and other types of waste.

5.6.5 The Government will also consider the possible introduction of legislation concerning the use, storage, labelling and marketing of all agricultural chemicals. This will be undertaken in the interests of ensuring that such chemicals are safely handled and used throughout Botswana.

5.6.6 It is particularly important to the Government that there should be close consultation and cooperation between relevant authorities in enforcing all environmental legislation concerning pollution prevention and control, both existing and future laws.

5.6.7 Government will also ensure that pollution prevention and control requirements are taken into consideration in all land use planning activities. The aim of this will be to reduce or eliminate any harmful effects on natural and human resources.

5.6.8 The need to improve the facilities for the detection and monitoring of pollution is recognized.

5.6.9 Attention has been given to the preparation of a new comprehensive piece of legislation, entitled a Protection of the Environment Act. However, after full consideration the Government has decided that in the short-term the existing legislation, amended as

necessary, should continue to be used. This is preferred rather than the introduction of a completely new law. Having sought to operate and enforce this existing amended legislation to full effect for a further period, the Government will then review whether or not and to what extent the legislation has been effective. In the event of serious deficiencies, the Government will give further consideration to the preparation of a comprehensive new piece of legislation.

Educational, Training and Research Measures

5.6.10 A series of public educational campaigns will be initiated by Government concerning:

- a) the possible effects of pollution on both human and natural resources;
- b) the methods of preventing pollution.

5.7 CONSERVATION OF WILDLIFE, HERITAGE AND CULTURAL RESOURCES

5.7.1 During the District and village consultations, the conservation of wildlife, heritage and cultural resources also emerged as an important issue. The Strategy recognizes the importance of this issue, which impinges significantly on the potential of both the wildlife utilization and tourism industries. The main measures, comprising the generally agreed "solution package" are summarized below.

Planning, Management and Incentive Measures

5.7.2 It is recognized that, as part of the District Land Use Planning process, priority needs to be given to the gazetting of the designated WMA's.

5.7.3 There is support for Game Reserves in general to be upgraded to National Parks, since the former only protect the animals under the principal law (although the Minister can make Regulations to cover other aspects) and are more easily degazetted than are National Parks. Only approximately 6.5% of the country is gazetted as National Park. At a cabinet meeting in 1976, it was recommended that there should be unified regulations for both categories of protected areas. Since then, this recommendation has been effected.

5.7.4 The need to make adjustments to the National Parks themselves is also recognized in two respects:

first, a number of areas were recommended for gazetteement back in 1976, on account of their botanical interest;

secondly, the Linyanti-Savuti triangle merits consideration as part of the Chobe National Park or a WMA, as only some 10 km of river swamp frontage is presently protected in the park.

- 5.7.5 In the broader context, the Government is mindful of its international conservation responsibilities. Consequently, ratification of the 1966 African Convention, the World Heritage Convention and the Ramsar Convention on Wetlands of International Importance is under consideration.
- 5.7.6 Widespread consensus exists concerning the need for the preparation and implementation of management plans, covering all national parks, game/forest reserves and WMA's. Government intends that these plans should include ways of enabling the local populations to benefit from the conservation and utilization of wildlife.
- 5.7.7 The Government, along with the Kalahari Conservation Society and private sector companies, is providing additional resources to cope with the threat of increased poaching.
- 5.7.8 Through a series of community-based wildlife cropping projects, the Government is embarking upon implementation of the Wildlife Conservation Policy. These projects relate to the cropping of populations, on a sustainable basis. In this endeavour, considerable donor support is forthcoming, which touches upon additional education, training and research inputs. It is intended that extended support for such initiatives will be forthcoming when the NCS is implemented. As part of this, several investigations concerning price incentives, marketing facilities and infrastructural provisions generally will be required.

Legislative Measures

- 5.7.9 The primary requirement concerns the production of a new, single, unified Act incorporating both the National Parks Act 1967, and the Fauna Conservation Act 1961. The Act will thus focus exclusively upon national parks and wildlife matters. It is recognized that in conformity with modern African conservation legislation, this would provide many benefits:
- a) the removal of inconsistencies from and a reduction in the weaknesses of the existing laws;
 - b) the provision of increased penalties which are in line with economic values, in the case of offenses;
 - c) the opportunity to reflect the utilization objectives of the Wildlife Conservation Policy and to take account of international conventions;

- d) the scope to attach prime importance to the conservation of wildlife habitats in protecting ecosystems.

The realization of such benefits is regarded by Government as a matter of considerable importance.

5.8 INSTITUTIONAL AND OTHER POINTERS

- 5.8.1 In implementing the six 'solution packages', attention will need to be paid to ensuring effective coordination of all the Government agencies involved. In the past environmental responsibilities have been significantly fragmented. Furthermore, little interest has been displayed in meeting shared goals, either in preference to, or as well as achieving inevitably narrower sectoral targets.
- 5.8.2 The requirements of the Strategy in terms of organizational, institutional and resource matters have received careful consideration by Government. However, before describing these dimensions, which are themselves crucial to the success of the Strategy, it is important to consider the benefits which the Strategy is intended to confer. The expected benefits are outlined in Section 6.

SECTION 6 : THE EXPECTED BENEFITS

6.1 ENVIRONMENTAL CHANGES

6.1.1 The Strategy proposed by Government involves two types of environmental changes: those relating to conservation and protection on the one hand; and those concerning development on the other. Both types of changes are expected to yield tangible benefits for the nation. Some of these are undoubtedly achievable within five or so years. However, Government recognizes it is realistic to expect that other benefits will only occur over a longer time scale.

6.2 BENEFICIAL CONSERVATION/ENVIRONMENTAL PROTECTION CHANGES

- 6.2.1 Through the Strategy it is intended that all important ecosystems, wildlife habitats, landscapes and cultural features should be surveyed in detail preceding the preparation of management plans. As a result, their management will be appropriately improved, leading both to reductions in habitat losses and numbers of endangered species, as well as to increased populations of species, presently threatened. This will be achieved by significantly increasing the calibre and number of conservation orientated extension officers, workers, etc. employed by central and local Government, the NGOs and the private sector.
- 6.2.2 Likewise, it is intended that Botswana will be able to harness international assistance in protecting all natural and cultural areas of outstanding, universal value. It will seek to do so, as a signatory of various agreements and Conventions, such as CITES and The African Convention on the Conservation of Nature and Natural Resources.
- 6.2.3 It is reasonable to expect that, as a result of research, education and technical programmes, increasing progress will be made in restoring degraded rangeland pastures and eroded areas. This will ultimately enable both the numbers and quality of cattle, small stock and wildlife to be increased. Similarly, progress in reducing desertification is to be expected.
- 6.2.4 Implementation of the Strategy should also witness important improvements in both the conservation and cost-effective use of all natural resources; water resources in particular.
- 6.2.5 Another tangible result should be the substantial removal of the present principal sources and sites of pollution (illegal waste tips, abandoned overburden, urban litter, toxic discharges, etc.) through a combination of incentives and improved controls.

6.3 DEVELOPMENT : ENVIRONMENTAL BENEFITS

6.3.1. The Government intends that the Strategy should yield tangible environmental benefits through specific development initiatives. These include:

- a) relief of the pressure on pasture resources through further diversification of rural employment opportunities. Such opportunities include craft, tourism, speciality cropping, veld products, agro-forestry, timber processing and other enterprises. Urban investment opportunities will be encouraged to the same end;
- b) significant improvement to the agricultural environment. This will be achieved through the adoption of multi-purpose land use/management practices. These will not only lead to increases in the productivity of the arable sector, but to increases in the number of woodlots, based on indigenous species, increases in the planting of windbreaks and live fences and increases in the populations of wildlife available for utilization;
- c) elevation of tourism to the status of a major industry. It will thus be a source of employment in additional areas of the country (e.g. Central Kalahari Game Reserve, Gemsbok National Park, etc.) The standards, variety and quality of tourist facilities will be improved, along with the management of visitor services in all tourist areas. Provision will be made for school children, in particular, to visit national heritage areas;
- d) promotion and provision of alternative sources of domestic fuel. This will apply especially for the poorer communities in each of the major settlements. Such action will be an essential component of schemes designed to restore the tree cover around such settlements.

6.3.2 It is the intention of Government to enhance the landscapes of all main settlements. These improvements will be achieved through:

- a) the provision of well planned, designed and managed areas of open space for public recreational use; and
- b) the establishment of significantly increased numbers of well grown trees.

The Government will encourage such initiatives with the help of local organizations, such as the VDC's and NGO's.

6.4 COMMUNITY BENEFITS

6.4.1 The Strategy is not concerned solely with economic and physical improvements. The Government is equally

committed to encouraging changes which generate social and community benefits.

- 6.4.2 Through the NCS, public awareness about the importance and value of both sustainable development and conservation will be widened as well as intensified. This will apply to all sectors of society through annual environmental award schemes. These will be well organized, both nationally and locally, under the patronage of the President and Members of Parliament. Such schemes will have a wide coverage including villages and urban settlements; the industrial and property development sector; the tourism sector; schools and youth clubs; the NGOs and voluntary sector. In short, all sectors of Botswana society will have the opportunity to participate.

6.5 APPRAISAL

- 6.5.1 In short, when viewed collectively the expected benefits are substantial. At the same time the Government acknowledges that they will not be realized without substantial changes in terms of:

- a) institutional and organizational arrangements; and
- b) resource allocations.

Indeed, the justification for such changes stems in large part from the employment and income improvements, which the Strategy will help generate.

- 6.5.2 When the expected environmental and community gains are taken into account, along with the economic improvements, the overall benefits of the NCS are likely to be substantial. Thus, the case for Government to implement the NCS, through making special resource allocations, is compelling.

PART THREE

IMPLEMENTATION POINTERS

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SECTION 7 : THE ORGANIZATIONAL AND RESOURCE IMPLICATIONS

7.1 OUTLINE

- 7.1.1 This Section focusses attention on two of the main implications of the Strategy:
- a) the main organizational and institutional changes required;
 - b) the likely financing and extra manpower resource requirements.

7.2 ORGANIZATIONAL AND ADMINISTRATIVE MEASURES

- 7.2.1 There is widespread recognition of the need for a number of organizational changes within Government, in the interests of improving the effectiveness with which natural resources are planned, used and restored. The current situation is that there are several sectoral Ministries whose portfolio responsibilities include, either in part or totally, one or more of the NCS key issues. As the executive arm of the Government, the sectoral Ministries are responsible for these functions and are accountable to Cabinet for the outcome. It is clearly important that both adequate support and resources should be provided to all relevant Government Departments/Ministries, so that they are better able to discharge their collective responsibilities for the environment.
- 7.2.2 Even more important, though, Government recognizes the need to provide mechanisms which ensure that there is close liaison between all Ministries and other organizations: NGO's including the Natural Resources Conservation Society of Botswana, the University, the private sector, etc. Environmental enhancement calls for a high level of inter-sectoral co-operation.
- 7.2.3 In considering the organizational arrangements required in support of the NCS, Government intends both to strengthen existing organizations and to provide new administrative structures. The Government attaches such importance to the NCS that the establishment of new institutional arrangements is well justified.

7.3 PRINCIPLES UNDERLYING THE PROPOSED ORGANIZATIONAL ARRANGEMENTS

- 7.3.1 The principles underlying the multi-sectoral organizational and management arrangements, required for timely and effective implementation of the NCS have received very careful attention by Government. These principles are described in paragraphs which follow.
- 7.3.2 There are well recognized needs for both:

- i establishing an appropriate organizational authority/agency, which is vested with prime responsibility for both co-ordinating implementation of the NCS and maintaining its close links with the National Development Plan process; and
 - ii providing a framework within which such an authority can operate effectively.
- 7.3.3 The powers under which the NCS is to be implemented and periodically reviewed must be clear, sound and adequate. Since the whole concept of the NCS is based on effective integration of inter-sectoral responsibilities and functions both within and outside Government. Such integration calls for the establishment of organizational arrangements which are accepted by all sectors and interest groups.
- 7.3.4 The Government intends that the responsibilities for formulating, directing, coordinating and evaluating the NCS policies and programmes shall be specified from the outset. This also means that the functions of the organization/Agency responsible for implementing the NCS are clearly defined and approved, in relation to the roles of all the sectoral Ministries and interest groups involved.
- 7.3.5 The associated requirements itemized below are considered by Government to be important. They will be acted upon accordingly; namely the need for:
- a) simple and practical mechanisms for coordinating the sectoral interests;
 - b) clear definition and allocation of the specific operational responsibilities of each of the Ministries, parastatals, NGO's etc., in implementing the NCS;
 - c) provision of an institutional framework for pooling the expertise and resources of all Ministries and organizations involved in implementing and furthering the NCS.

7.4 PROPOSED IMPLEMENTATION STRUCTURES WITHIN GOVERNMENT

- 7.4.1 Against this background, Government accepts three main recommendations. These are summarized below:

First, it is recommended that a policy instrument be provided for approval by Cabinet, enabling two new bodies to be established, namely: an NCS Advisory Board and an NCS Co-ordination Agency. The Board should be under the chairmanship of the Minister of Local Government and Lands. It will be directly responsible to Cabinet through the Minister, and consist of the relevant senior representatives from all those organizations and sectoral interests, which need to be deeply involved in helping to implement the NCS, i.e.

all those parties which share a common interest in the well-being of the environment. These include central and local Government, the Chiefs, parastatals, NGO's, educational and research establishments, the media and the private sector. The Board will need to be serviced by a small professionally-staffed secretariat. This will be the NCS Co-ordination Agency. The main functions of the latter, in addition to servicing the Board, will be to co-ordinate the execution of both its decisions and the Strategy in the most effective ways.

Secondly, it is recommended that an NCS White Paper and subsequently a legal instrument, be prepared for approval by Parliament, to cover the following:

- . the requirement that all sectoral ministries, departments, local authorities, parastatals, etc., shall, in the course of their work, show due regard for the conservation and enhancement of the environment in the interests of achieving sustainable development;
- . the need for the sectoral Ministries of Government, in particular, to work closely with the NCS Coordination Agency in discharging their environmental responsibilities;
- . the necessity for new development projects (public and private) to be accompanied by professionally prepared and approved EIA's;
- . the obligation for the NCS Agency to prepare annual/biennial State of the Environment Reviews;
- . the provision of necessary powers, whereby Planning and other Authorities can be required to prepare conservation and resource strategies at District/Local levels and to review them regularly;
- . the financial and other encouragement which Government intends to give to NGO's in sharing responsibility for both conservation and enhancement of the nation's environment.

Thirdly, it is recommended that Environmental Liaison Officers be designated from within each of the appropriate Central Government Ministries/Departments. They would be responsible for ensuring that their organizations comply with the NCS Act once passed, and for liaising closely with the NCS Co-ordination Agency. In the case of the relevant Central Government Ministries, the nomination of Environmental Liaison Officers may involve formalizing the representation of the organizations which attend the Inter-Ministerial Co-ordinating Environmental Sub-Group (ICES). It is envisaged that, at the District level, the liaison function will be performed by the District Officers Lands, who will be redesignated District Environmental Officers. The importance of ensuring development of

the necessary links and regular liaison between Ministries, Departments and local authorities, is well recognized.

- 7.4.2 It is intended that the NCS Advisory Board will play an important role in the sustainable use of natural resources and thus the operation of the NCS Act. In cases of doubt concerning the discharge of environmental responsibilities/obligations by organizations and individuals under the Act, the Board would provide guidance as to how the obligations may best be met. The Board would similarly have the prerogative to advise the relevant organization/s where it believes that the environment is being compromised through either policies or activities which merit review. In addition, the Board would be responsible for the presentation of an annual State of the Environment Report. It is envisaged that all Ministries, organizations and interests would, when requested, assist the Board - especially concerning the provision of information - in discharging this responsibility.

Supplementary to the actions of individual Ministries, the Board would also encourage and assist sectoral Ministries to undertake a review of existing legislation, having regard specifically to the objectives of the National Conservation Strategy. The purpose of these reviews would be to assist in improving the implementation and enforcement procedures falling under the purview of the Ministries concerned. All proposed legislative amendments will be presented to the Attorney General's Chambers for due consideration.

- 7.4.3 Preliminary Terms of Reference have been drafted for both the proposed NCS Advisory Board and the NCS Coordination Agency (ref. Annex 1 : Figures 7 and 8).

- 7.4.4 It is generally acknowledged, both by Government and all other interested parties, that effective implementation of Botswana's NCS will require a major effort in liaison, planning, research and analysis, coordination, monitoring, training and promotional tasks. Additional resources, in the form of experienced specialist staff, are therefore likely to be required. This applies particularly for the following main functions, which need to be undertaken in close liaison with all appropriate Ministries and organizations:

- a) Planning and programming the integrated conservation and development of natural resources;
- b) Coordinating the formulation and implementation of all policies, so as to conserve natural resources and to develop them in a sustained manner;

- c) Analysing and determining the priorities of the many research needs emerging from the NCS Technical Reports. This work should provide the foundation, upon which a research strategy should be prepared in support of conservation for development throughout Botswana;
- d) Establishing widespread educational and training programmes in conservation and sustainable development;
- e) Drawing up implementation programmes for the NCS and monitoring their progress, through the preparation of annual/biennial "State of the Environment Reviews";
- f) Coordinating the preparation and evaluation of EIA's;
- g) Overseeing the extensive promotional and information campaigns required in support of the NCS;
- h) Advancing the contributions which environmental data systems and economic tools can make to assist decision-makers.

7.4.5

It is recognized that under "The NCS Act" there should be a formal requirement for all projects (whether public or private), which are likely to have a significant effect on the environment or on natural resources, to be subject to the preparation of a detailed assessment of their environmental impacts. The purpose of such an assessment is to enable "the competent authority" (Ministry/Department/District Office) to arrive at decisions on development projects with the benefit of a full understanding of the environmental as well as the economic, social and environmental costs, which will be incurred in both the short and long-term. It is intended that the NCS Act should provide full guidelines on EIA procedures, including a list of the Classes of projects which should give rise to the preparation of an Environmental Impact Assessment (EIA). At this stage, the following procedures are envisaged:

- a) an assessment will normally be prepared by and at the cost of the proponent (developer), who will be encouraged to work in close co-operation with "the competent authority" and the NCS Co-ordination Agency. Where a developer is uncertain as to whether an assessment should be prepared or where a question arises as to the adequacy of an assessment, reference would be made to "the competent authority", and, where appropriate, to the Agency for guidance;
- b) the NCS Co-ordination Agency, acting on behalf of the Board and in consultation with "the competent authority" concerned, would reserve the right in certain circumstances to call for the preparation of an EIA by an independent organization. In such circumstances, the terms of reference for the preparation of the EIA would first be agreed between

"the competent authority", the proponent and the Agency;

- c) all EIA's will be submitted by the proponent to "the competent authority", who would then pass them to the Agency for scrutiny. Members of the public would be provided with opportunities to inspect the EIA at convenient locations;
- d) the proponent would be notified within two months of the submission as to the decision of approval or rejection by "the competent authority" and the Agency. Where there is disagreement about the outcome of an EIA, the Board would initially act as referee. Cabinet would be the ultimate arbiter;
- e) the NCS Co-ordination Agency would be responsible for issuing all certificates of approval to the proponent, on behalf of "the competent authority" and the Board.

7.4.6 One of the principal functions of the Agency would be to advise and support the existing line Ministries/Departments and Local Authorities in discharging their various responsibilities for the environment. It is envisaged that the Agency would coordinate and help, as appropriate, the work entailed in undertaking four main categories of environmental improvement projects. These are as follows:

environmental projects undertaken at Village and District level. It is expected that NGO's, especially the newly formed Natural Resources Conservation Society of Botswana (NRCSB), would play a role in stimulating and aiding these projects. However, it seems highly likely that a significant coordination role, in support of the Local Authorities, would need to be played by the Agency in the early years. This applies to all projects whether they are implemented by the NGO's or by District Authorities;

environmental projects undertaken through other Ministries, Government Departments and parastatals, at national level. Through its professional expertise the Agency would be available to help the execution of these projects in their various phases. It is proposed that a member of the Agency should attend meetings of the relevant Project Steering Group or Committee;

environmental projects specifically initiated and managed by the Agency, with inputs from other Ministries/Organizations as appropriate. An example of such an initiative has been the role of DTRP in enlisting the support of UNEP. The purpose has been to stem advancing desertification in three main areas of Botswana by obtaining help from all sections of Government in harnessing the most up-to-date research results.

environmental projects undertaken either jointly or through NGO's.

- 7.4.7 A simple organizational structure would be required (in the short-term) for implementation of the NCS (ref. Annex 1 : Figure 9). This structure reflects the importance which is attached to establishing close liaison between the Agency and all organs of Government, NGO's private sector interests, etc..
- 7.4.8 There is general agreement that the establishment of the "NCS Advisory Board" and the NCS Agency should complement rather than duplicate the roles performed by existing Boards, e.g. the Agricultural Resources Board, the Water Apportionment Board and the Land Boards. It is envisaged that the NCS would help by strengthening linkages between existing organizations. The establishment of strong linkages would also apply in the case of any new Boards, which Government might at some future stage decide to establish.
- 7.4.9 Government recognizes that one of the most important manpower resource implications of the strategy will be the need to provide and train professional/technical personnel to undertake the all-important extension work. International experience has clearly demonstrated the benefits of having staff specifically assigned to look after the extension needs, concerning conservation and integrated development. There is a possibility that the staff required could be provided through re-deployment and training of some existing Local Authority staff. It is envisaged that the Conservation Officers, which are proposed for the re-organized Agricultural Resources Board, will also make an important contribution.
- 7.4.10 In providing this extension service, it is intended that there should be close liaison between all interested parties. This includes the District Administration staff involved, the newly formed Natural Resources Conservation Society, the extension services of the sectoral Ministries and the existing NGO's.

7.5 IMPLEMENTATION STRUCTURES OUTSIDE GOVERNMENT

- 7.5.1 The increasingly important roles performed by NGO's towards conserving and enhancing the national environment are appreciated by Government. It is recognized that successful implementation of many of the NCS proposals and projects will be achievable primarily through continued support of the NGO's; in particular, the Botswana Society, the Kalahari Conservation Society, Thusano Lefatsheng, the Forestry Association of Botswana and the Botswana Bird Club. Indeed, it is felt that there will be strong need for increased involvement and thus support from Government.

- 7.5.2 At the local level it is expected that the NRCSB will play an important role. This will involve coordinating environmental activities at the 'grass roots' village level, which is where the majority of NCS small-scale projects will need to be undertaken. The objectives of this nation-wide organization are to promote the enhancement of the natural, built and social environments. It seeks actively to assist the conservation of the nation's natural resources through direct involvement of the public in general. At the same time, it aims to cooperate closely with existing conservation NGO's (e.g. the KCS Education Officers and the FAB Forestry Extension Officer), in servicing the needs of local communities for advice, physical and other resources.
- 7.5.3 The organizational structure for implementing NCS projects at District/Village levels has received preliminary approval by Government (ref. Annex 1 : Figure 10).
- 7.5.4 Notwithstanding the importance of NGO contributions, it is recognized that the implementation provisions external to Government need to be extended to include the private sector. In particular, this involves the leading commercial companies and developers, the hoteliers and Safari companies, the banking, engineering and property development professions, etc. Such participation will be encouraged by Government.

7.6 ESTIMATED RESOURCE REQUIREMENTS

- 7.6.1 Implementation of the Strategy undoubtedly calls for the provision of significant additional resources. Four principal requirements are envisaged, namely:

First, there are the resources required for the establishment and operation of both the "NCS Advisory Board" and the NCS Co-ordination Agency. It is proposed that the Agency should start small, comprising a Director and four professional experts. This represents the minimum number required to cover the range of natural resource planning/management issues involved, the EIA work and the co-ordination of environmental improvement measures. The annual costs involved for the operation of these new institutions, including co-ordination of the Environmental Liaison Officers in the Ministries and Local Authorities together with remuneration for private sector members of the Advisory Board, are estimated at between 0.5-0.6 million Pula. This estimate excludes initial capital costs. As the work of the NCS Co-ordination Agency grows, so will the need for staff. The full complement of local and other experts, required for operation of the Agency during the first five years, is estimated at twelve.

Secondly, there are the additional funds required to cover existing organizations, throughout all sectors of Government, so that they can play their full part in the implementation of the NCS.

Thirdly, there will be the need for resources to undertake special training, R&D, data collection, monitoring and promotional programmes outlined earlier.

Fourthly, a programme for the implementation of projects phased over a five year period, will need to be funded. A total of 42 priority project proposals have been recommended by the respective Ministries, in the course of preparing their NCS Technical Reports.

7.6.2 Since the NCS is a major national initiative, aimed at improving the use of resources for sustainable development, the Government is committed to making a significant investment in the institutional structures and manpower required. To the extent that existing local skills, resource and funds permit, as many of the staff requirements as possible will be met by redeployment and appropriate training of Batswana. In cases where it proves impossible to recruit local staff, the help of the international community, which has shown great interest in assisting the NCS, will continue to be enlisted.

SECTION 8 : THE WAY AHEAD

8.1 COMMITMENT TO IMPLEMENTATION

- 8.1.1 The Strategy proposals are regarded by Government as being realistic for four main reasons:

first, the Strategy faces up to the difficult issues of overgrazing and woodland depletion, which are not amenable to solution except through long-term, incremental measures;

secondly, the Strategy offers alternative opportunities, in the pursuit of wealth and jobs, for using the country's natural resources. These will be through ways which are not only economically effective but environmentally benign;

thirdly, the Strategy recognizes the importance of providing town dwellers, in particular, with new attractive investment opportunities as alternatives to livestock. Such opportunities are essential as main sources of capital growth and income;

fourthly, the Strategy conforms with the expected scope of influence, described in NDP 6 (ref. Annex 1, Figure 1).

- 8.1.2 The Strategy will be published by Government as a White Paper, and the most appropriate vehicle for implementing the Strategy is through an NCS Action Plan.

8.2 MAIN INGREDIENTS OF THE ACTION PLAN

- 8.2.1 The Action Plan will initially concentrate on the 'solution packages' required to address the five key and other issues covered under the Strategy. Its preparation will conform with standard NDP processes and practices. Inevitably, much of the initial action will involve making the organizational adjustments and institutional arrangements, described earlier. Relatively little can be achieved until these have been effected.

- 8.2.2 In implementing the Strategy, there are initially six specific steps which the Government intends to take. These are to:

- a) establish the NCS Advisory Board;
- b) set up the NCS Co-ordination Agency;
- c) appoint the Environmental Liaison Officers within the Ministries and Local Authorities;
- d) encourage the NGO's and private sector organizations to participate in the preparation and implementation of the Action Plan;

- e) initiate a carefully co-ordinated environmental awareness programme throughout the country, part of which will be to introduce Environmental Improvement Award Schemes;
- f) commence to put in place the 'solution packages' for the key and other issues.

8.2.3 The Action Plan will also include a well designed monitoring programme. As part of the NDP process, the Strategy will be subject to regular reviews and updating. A major component of this will be the preparation of an annual "State of the Environment" review.

8.2.4 The Government is committed to ensuring the success of the NCS and specifically the achievement of its twin goals: sustainable development through and with the conservation of natural resources. It is through successive NCS Action Plans that these environmental goals will be sustained. They will be sustained in ways which are politically, economically and socially acceptable; in short, in practical ways.

ANNEX 1 : FIGURES

1. The main Participants and Features of the NCS Process.
2. Infrastructure Resources: Existing Legislation Available in Controlling the Conservation and Development of Natural Resources.
3. Institutional Resources: Existing Environmental Planning and Management Responsibilities of Central and Local Government.
4. Summary of Landscape, Historic and Cultural Resources.
5. A Schematic Representation of the Inter-relationships Between Population Variables and Renewable Natural Resources.
6. Summary of the Main Pointers for the Sustained Development of the Wildlife Sector.
7. NCS Advisory Board: Proposed Terms of Reference.
8. The Main Functions Envisaged for the proposed NCS Co-ordination Agency.
9. Organizational Structure Recommended for Implementation of the NCS at Central Government Levels.
10. Organizational Structure Recommended for Implementation of the NCS at District/Village Levels.
11. The Scope of the NCS as Envisaged Under NDP VI.

ANNEX 1 : FIGURE 1 : THE MAIN PARTICIPANTS AND FEATURES OF THE NCS PROCESS

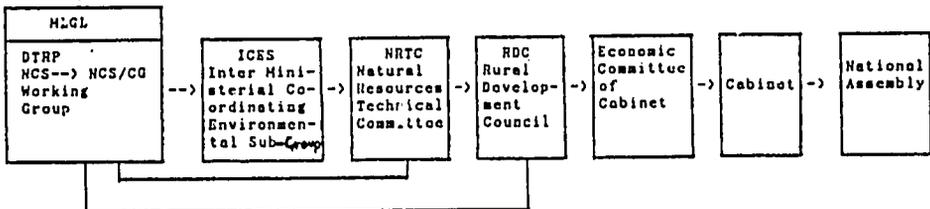
A. INTERESTED PARTIES

- . Village elders and members
- . District Council Officers and elected representatives
- . Central and District Government Officers from all Ministries, Boards, Councils
- . Ministers, M.P.'s of all parties
- . Non-Governmental Organizations: e.g. BS, KCS, FAB
- . Parastatals: Water Utilities Corporation, BPC, BDC, BMC
- . Educational and research establishments: UB, NIR, the Museum
- . The International Donor Agencies: UNDP, UNEP, The Netherlands Government, NORAD, SIDA, EEC
- . International Environmental Agencies: IUCN, UNDP, UNEP
- . Private/Public Companies: e.g. BGI, Barclays Bank

B. IMPRESSIONISTIC SURVEYS

	Sample Size	(Participants)
Public Discussion Campaign		
Villages.....No.	60	Villages
District/Town Consultations..No.	30	Councils
Household Opinion Survey.....No.	3000	Householders
Technical Reports covering 27 different aspects of Botswana's Natural Resources.....No.	38	Authors

C. OFFICIAL COMMITTEES/BODIES



- Key: MLGL : Ministry of Local Government and Lands
 DTRP : Department of Town and Regional Planning
 NCS/CG : NCS Co-ordination Group
 ICES : Inter-Ministerial Co-ordinating Environmental Sub-Group
 NRTC : Natural Resources Technical Committee
 RDC : Rural Development Council

ANNEX 1 : FIGURE 2 : INFRASTRUCTURAL RESOURCES: EXISTING
LEGISLATION AVAILABLE IN CONTROLLING THE
CONSERVATION AND DEVELOPMENT OF NATURAL
RESOURCES

The Laws Protecting Animal Resources

The Fauna Conservation Act
The National Parks Act
The Fish Protection Act
The Animal Diseases Act
The Tsetse Fly Control Act
The Fencing Act

The Laws Protecting Vegetation Resources

The Agricultural Resources Conservation Act
The Herbage Preservation Act
The Forest Act
The Locust Act

The Laws Promoting the Health and Welfare of Human
Resources

The Atmospheric Pollution (Prevention) Act
The Water Act and Water Works Act
The Mines, Quarries, Works and Machinery Act
The Town and Country Planning Act
The Monuments and Relics Act
The Public Health Act
The Buildings Act

The Laws Governing Land and Cultural Resources

The Land Control Act
The Stateland Act
The Tribal Land Act
The Town and Country Planning Act
The National Parks Act
The Trek Route Act
The Monuments and Relics Act

ANNEX 1 : FIGURE 3 : EXISTING INSTITUTIONAL RESOURCES: CENTRAL AND LOCAL GOVERNMENT, ENVIRONMENTAL PLANNING AND MANAGEMENT RESPONSIBILITIES

Ministry of Finance and Development Planning:
Overall Approval for Development Funding
National Income, Population and Other Environmental Statistics

Ministry of Local Government and Lands:
Landuse Planning (including urban development)
Land Boards and Local Authorities
Food Resources
State Land Administration
Mapping and Remote Sensing

Ministry of Agriculture:
Animal Health
Arable Crop Production
Tsetse Fly Control
Fisheries, Bee-keeping, Forestry and Veld Products
Range and Agricultural Research

Ministry of Commerce and Industry:
National Parks and Reserves
Wildlife Management
Tourism
Manufacturing and Commercial Utilization of Resources (excluding minerals and quarrying)

Ministry of Mineral Resources and Water Affairs:
Prospecting and Mining
Water
Energy

Ministry of Works and Communications:
Roads, Railways and Airfields
Telecommunications
Government Buildings
Meteorology

Ministry of Labour and Home Affairs:
Monuments and Relics

Attorney General:
Law and Justice

Ministry of Health
Public Health

Ministry of Education
Formal and Non-Formal Environmental Education

Ministry of External Affairs
International Conventions

Plans and development are co-ordinated and implemented as follows:

- Land Development Committees oversee the preparation of village plans;
- Village Development Committees advise on village developments;
- District Development Committees formulate District Development Plans;
- Land Boards allocate tribal land and administer the tribal land through the TLA;
- District Conservation Committees advise on conservation issues; (these are confined primarily to the control of soil erosion);
- The Ministry of Local Government and Lands administers the Land Control Act and the allocation of state land;
- Agricultural Resources Board is responsible for the conservation and management of veld products;
- Natural Resources Technical Committee advises on the use of resources at inter-departmental level.

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ANNEX 1 : FIGURE 4 : SUMMARY OF CULTURAL RESOURCES

NATURAL/MAN-MADE LANDSCAPES

Enclosed Landscapes*

Forests
Woodlands, including
riparian
Urban Settlements
Rural Settlements
Sand Dunes
Clusters of Palms,
Baobabs, etc.
Hills and Outcrops

Open Landscapes

Tree/Shrub Savanna
Floodplains and Deltas
Grass Savanna
Cultivated Areas
Pans and Lakes
Hills and Outcrops

ANCIENT MONUMENTS AND RELICS

Rock Paintings and Engravings.
Evidence of : Lithics; Middens; Burial, Smelting and
Human Smithying sites.
Activity
Prehistoric : Rock Shelters, Village Remains, Forts,
Sites Stone Tools, Ornaments, Pottery, Fossils

REMAINS OF MORE RECENT ORIGIN

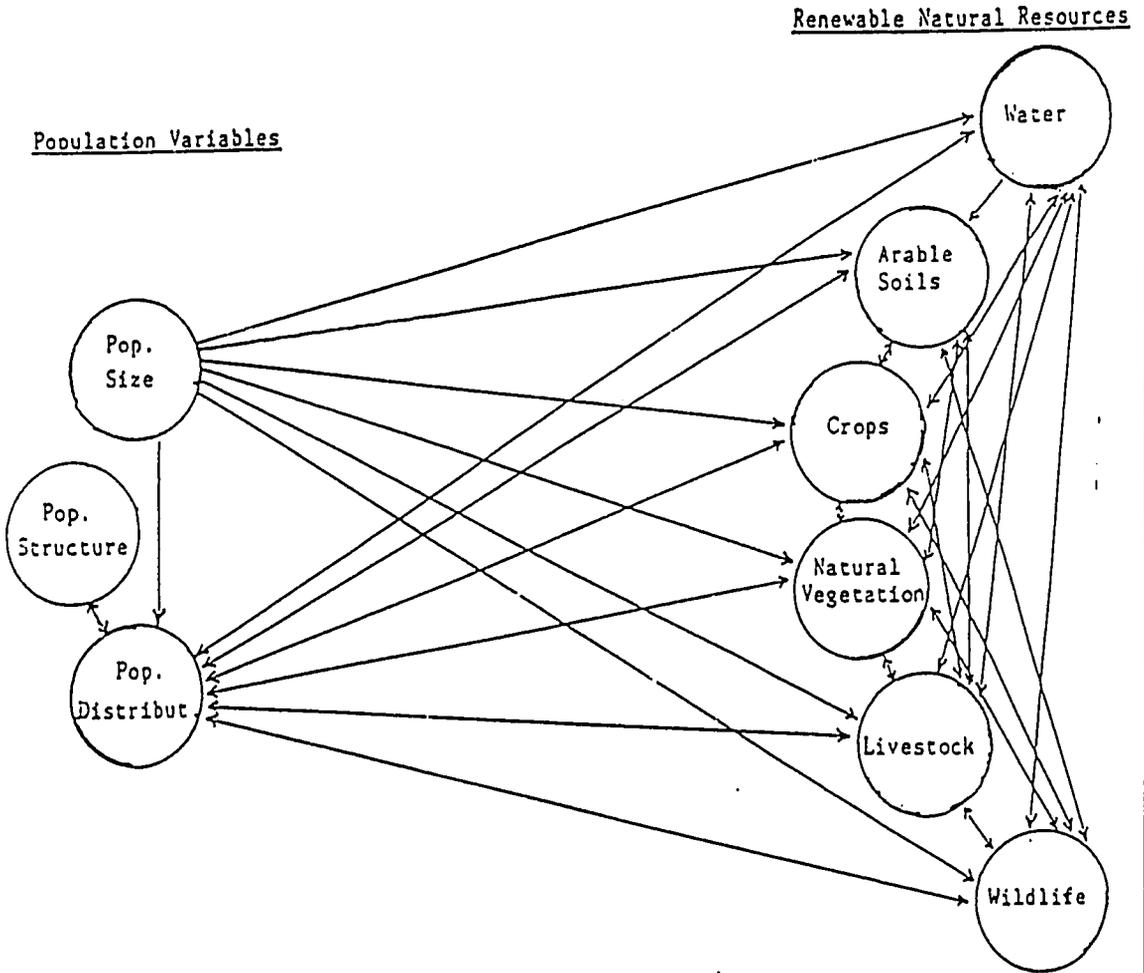
Missionary Sites
Battle Grounds and Forts/Fortifications
Graveyards
Pre-Independence Buildings and Traditional Settlements

SOCIAL CUSTOMS, COSTUMES, ETC.

The House of Chiefs
Kgotla Meetings
Tribal Dances
Totems
Traditional Doctors

* These are defined as those which have a high proportion of their horizons contained enclosed by one or more natural/man-made feature.

FIGURE 5 : A SCHEMATIC REPRESENTATION OF THE INTERRELATIONSHIPS BETWEEN POPULATION VARIABLES AND RENEWABLE NATURAL RESOURCES



Source: Ministry of Finance and Development Planning (1988)
 NCS Technical Report 'Population and Renewable Resources'.

FIGURE 6 : SUMMARY OF THE MAIN PROPOSALS FOR THE SUSTAINED DEVELOPMENT OF THE WILDLIFE SECTOR

- development should primarily be achieved through private sector investment;
- Attention should be paid to the traditional rights of people to wildlife and the possible needs/options for modifications;
- taxation and licencing fees should be minimised;
- participation and involvement of rural communities should be achieved;
- promotion of:
 - . small scale game harvesting enterprises in WMA's should be given high priority;
 - . intensive ostrich rearing and extensive ostrich egg production should be encouraged;
 - . the crocodile industry, should be fostered through intensive farms and ranches;
- intensification of both game viewing and safari hunting tourism should be undertaken ;
- management of the elephants should maintain populations at around present levels through judicious harvesting;
- expansion of quotas for capture and export of wildlife should be effected;
- encouragement should be given to game utilisation on all land where productivity can be increased or environmental damage reduced;
- promotion and integration should be encouraged in the case of:
 - . both large and small scale chemical tanning and crafts production;
 - . small scale ivory and other jewellery production should be encouraged;
- delineation of three land use zones within the WMA's should be achieved, namely:
 - . game viewing tourism zones;
 - . safari hunting tourism zones;
 - . harvesting/citizen hunting zones;
- establishment of a small, but effective, Wildlife Utilisation Unit within DWNP should be undertaken, especially because within Botswana wildlife utilisation under mixed grazing regimes is not totally proven.

Footnote: It should be noted that many potential wildlife utilisation areas exist in part of the country not suitable for livestock production.

FIGURE 7 : "NCS ADVISORY BOARD" - PROPOSED TERMS OF REFERENCE

It is proposed that the Board should:

- . co-operate, consult and work with all central Government Ministries and Local Government authorities, parastatals and private (non-Governmental, commercial and industrial organisations) in the broad interests of ensuring that the intentions of the Government concerning environmental conservation and improvement, are achieved;
- . promote the co-ordination of environmental policy formulation and implementation by all institutions;
- . encourage and support the formulation of projects, which enhance the environment and the natural resource base, and the procurement of funds for their implementation directly or through relevant institutions;
- . supervise the regular updating of the NCS;
- . take responsibility for the preparation of an annual/biennial "State of the Environment Review" and progress reports on the implementation of NCS projects;
- . assist the relevant institutions to develop Botswana's professional and skilled manpower in the interests of the country's natural resources and the environment in general;
- . seek to increase the environmental awareness of all strata of society;
- . liaise and support those non-Governmental institutions, which undertake conservation and environmental projects at Village, District and national levels;
- . assess the adequacy of all existing conservation legislation and examine the scope respectively for harmonization of policies and legislation; propose appropriate amendments from time to time, where feasible; make appropriate proposals for the implementation of conservation oriented legislation; make proposals for new conservation legislation, when appropriate;
- . promote and oversee the implementation of legislation and policies relating to the monitoring of the environmental impact of all (Government/private) projects which might either degrade or enhance the natural resource base and the environment generally;
- . promote co-ordination of conservation action plans among all institutions;
- . liaise with NGO's on aspects of natural resource conservation and environmental enhancement which impinge on their activities both within the SADC region and internationally, and undertake such liaison/co-operation within the policy directions provided by the Government;
- . work closely with MFDP to identify funding sources;
- . promote and co-ordinate environmental information and data collection through Government;
- . promote the carrying out of appropriate research;
- . promote and co-ordinate the improvement of environmental education for all sectors in discussion with the Ministry of Education and all other interested parties.

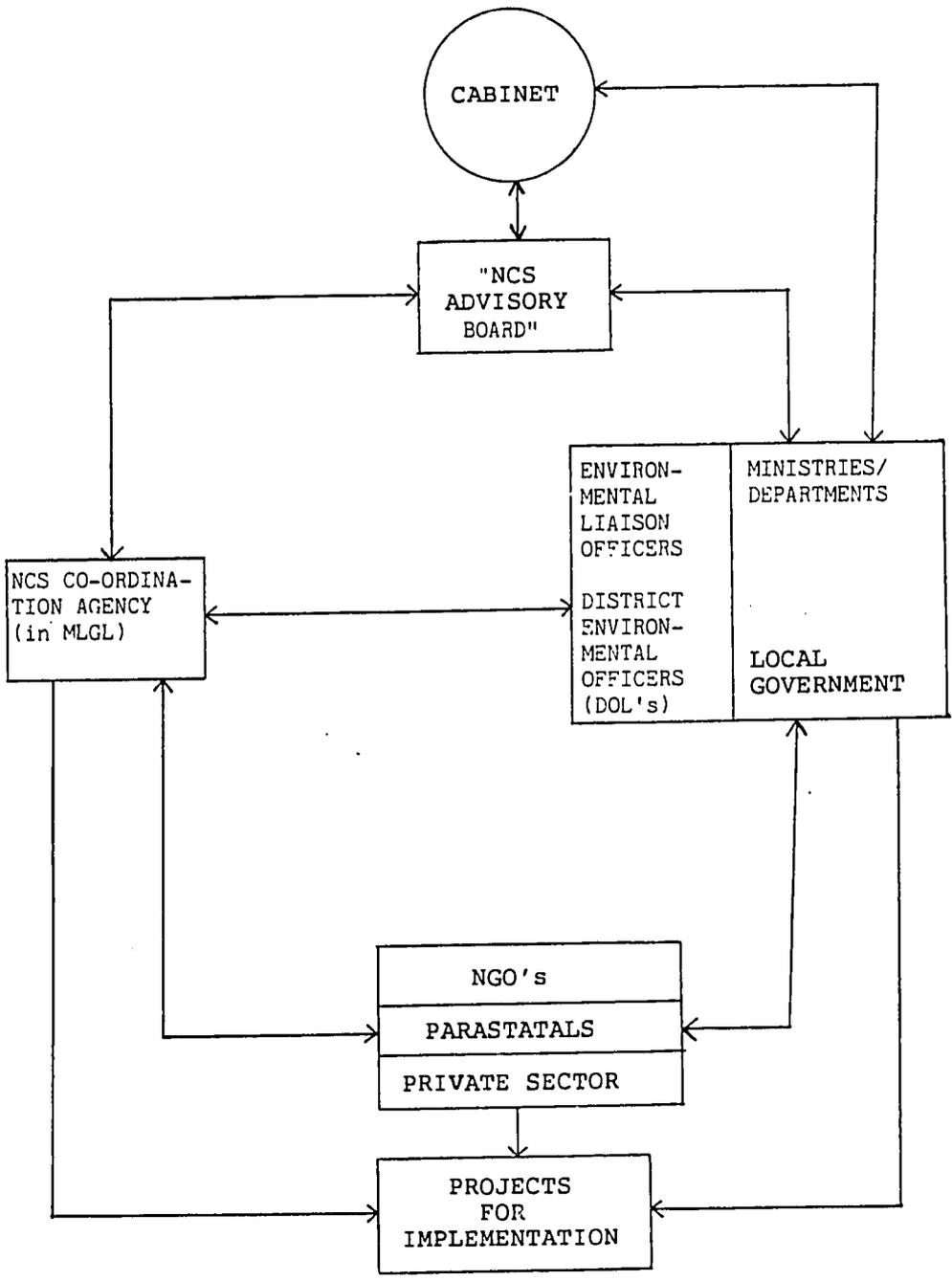
**FIGURE 8 : THE MAIN FUNCTIONS ENVISAGED FOR THE PROPOSED
NCS CO-ORDINATION AGENCY**

A Two main functions are envisaged, namely:

- A1 provision of all services required by the "NCS Advisory Board" to enable it to function both effectively and efficiently;
- A2 co-ordinate implementation of "NCS Advisory Board" decisions (i.e. serving as the "operational arm" of the Board);
- B A series of subsidiary liaison, co-ordination and related functions should be undertaken in fulfilling operational duties on behalf of the Board, namely:
 - B1 development and co-ordination of all environmental policy matters within Government and the "orchestration" of their achievement by sectoral Ministries;
 - B2 co-ordination of efforts through close liaison with the Central Government Ministries, Local Government Organisations, NGO's, parastatals and the private sector to ensure effective implementation of the NCS/NCSAP, especially the proposed Natural Resources Conservation Strategy Policy/Act; (i.e. the preparation of new, all-embracing environmental legislation;)
 - B3 adoption of NCS procedures and the preparation of both resource budgets/programmes in close liaison with MFDP to ensure consistency with NDP's/NDP reviews;
 - B4 establishment of an effective chain of implementation from Central Government right down to village level, based upon as much decentralisation of responsibility as can be efficiently achieved. This would entail encouraging public participation at District and village levels, through the support both of existing NGO's/voluntary organisations and of the new Natural Resources Conservation Society. It is envisaged that an effective implementation network would also require both the involvement of technically well qualified, conservation extension officers and the provision of training for village conservation leaders;
 - B5 installation of effective arrangements for promotion of the NCS/NCSAP widely throughout Botswana and for publicising its achievements. This is seen as being particularly important in changing public attitudes towards, and perceptions of, natural resource conservation for development. It is envisaged that particular effort would be devoted to A.V., film and radio programmes, with particular emphasis being given to arousing interest amongst schools;
 - B6 co-ordination of Research and Development efforts between all interested parties and the initiation of new research and demonstration projects where gaps exist, particularly at village level;
 - B7 preparation of an annual/biennial "State of the Environment Review;"
 - B8 encouragement of natural resource development initiatives at all levels;
 - B9 appointment and supervision of environmental consultants, as required.

Footnote: The establishment of an NCS Co-ordination Agency within M.L.G.L. is regarded as a 'middle course' of action. It recognises the importance of the tasks involved without entailing such radical changes as would occur if a Ministry of Natural Resources were created. The proposed organisational measures do not preclude other changes. Indeed they necessitate them. Such changes include appropriately strengthening existing Ministries and, in due course, establishing, say, a Department of Conservation/Sustainable Development.

FIGURE 9 : ORGANIZATIONAL STRUCTURE RECOMMENDED FOR NCS IMPLEMENTATION AT CENTRAL/LOCAL GOVERNMENT LEVELS



JB

FIGURE 10 : ORGANIZATIONAL STRUCTURE RECOMMENDED FOR IMPLEMENTATION OF THE NCS AT DISTRICT AND VILLAGE LEVELS

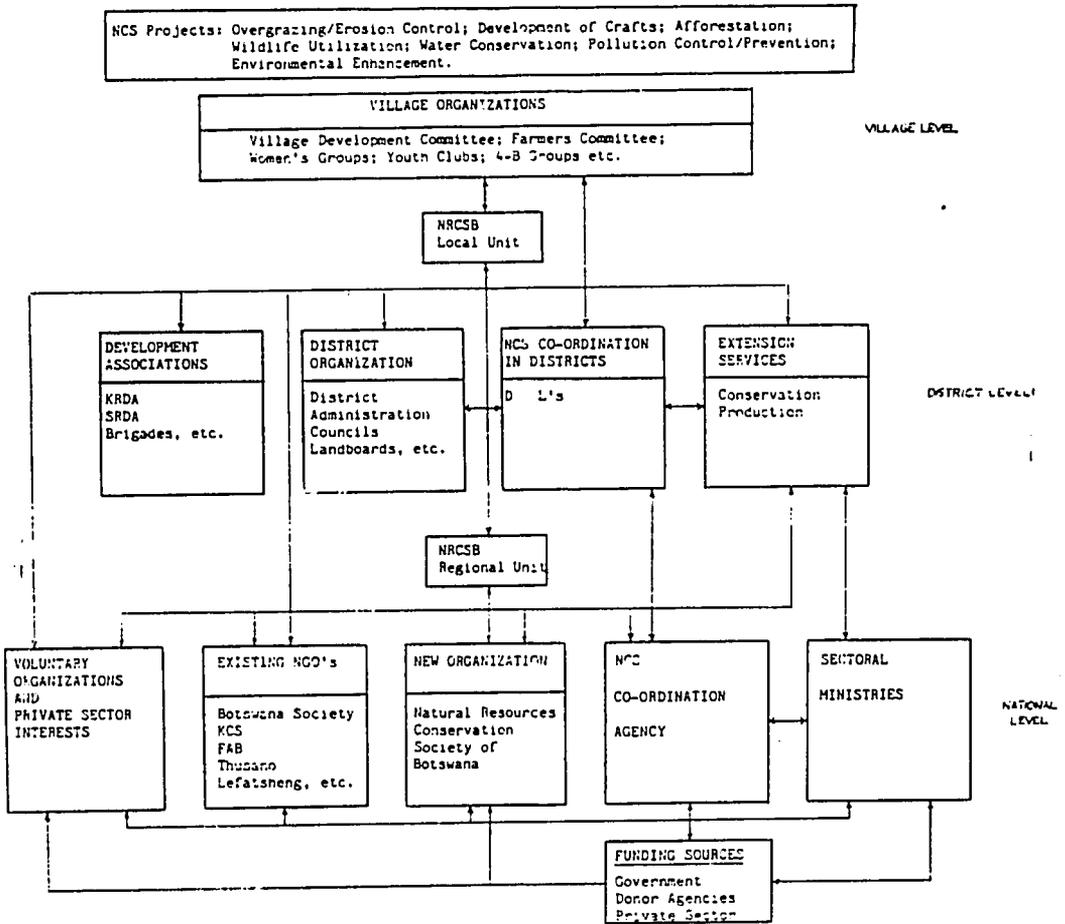


FIGURE 11 : THE SCOPE OF THE NCS AS ENVISAGED UNDER NDP 6

NDP 6 makes specific reference to the NCS as follows: "The National Conservation Strategy (NCS) will enunciate the long term methods of achieving sustainable development. It will combine development and conservation in such a way that future generations will also be able to benefit from the stock of natural resources which the country presently enjoys. Briefly, the National Conservation Strategy approach to management of natural resources calls for:

- a) preparing a strategy for addressing environmental and natural resource issues so as to ensure that the greatest number of people benefit on a sustainable basis;
- b) identifying urgent national resource problems likely to impede development objectives;
- c) assessing the supply of, and demand for, natural resources over the short, medium and long term;
- d) defining projects, within the strategic framework, to make the best use of limited natural resources;
- e) assigning responsibilities for action;
- f) generating better awareness of the problems of natural resources' use, and how to deal with them, within Government and all bodies concerned with them and concerned with development." [4.69].

The NCS in responding to this "specification" covers the main environmental issues which receive attention in NDP, namely overgrazing [1.22; 1.47], sustained agricultural production [7.3; 7.31], wildlife utilization and conservation [11.2; 11.8; 11.23; 11.24], diversification [1.49; 1.72; 7.72], forestry [7.78], fisheries development [7.79], tourism development [11.41], renewable energy [13.69], water resource use [8.8].

The NCS, like NDP, is intended to be regarded as a dynamic planning tool. As it evolves, so it will help to identify for Government the likely environmental implications of the different resource use/development options. It will thus have an important role to play in providing guidance on both the resource policy and planning choices to be made.

There is a potentially large agenda of issues to which the NCS can contribute, through the proposed institutions.

ANNEX 2: TABLES

1. Indicative Economic Contributions Derived from the Natural Resources of Botswana.
2. Comparative Water Demand and Water Resource Yield Figures.

TABLE 1 : ESTIMATED ECONOMIC CONTRIBUTIONS DERIVED FROM THE NATURAL RESOURCES OF BOTSWANA*¹

RESOURCE	GROSS OUTPUT* ⁵ Pula million	GROSS VALUE ADDED Pula million	EMPLOYMENT* ⁶ rounded
RANGELAND			
Livestock			
Communal	81.0	56.0 ⁵	143,000
Freehold	29.2	6.6 ⁵	N/A
Veld Products			
Commercial* ²	4.4	N/A	2640
Subsistence	50.0	N/A	N/A
Wildlife/Tourism			
Photographic			
Safari	27.6	8.2) 2020* ³
Hunting			
Safari	6.3	2.4)
Wildlife)
Farming* ⁴	1.1	0.6)
Trade/)
Processing	5.4	2.1	N/A
Subsistence	8.1	6.7	5020
FISHERIES			
Commercial	4.7	N/A	900
Subsistence	2.6	N/A	5,000- 11,000
FORESTRY			
Commercial	11.0	N/A	N/A
Traditional	23.0	N/A	N/A
WOOD FUELS			
Urban	13.0	N/A	N/A
Rural	16.6	N/A	N/A

Sources: 'Economics for Sustainable Development', Perrings, C.A., Pearce, D. et al 1988. Annexure 2 pp 133-135. 'The Contribution of Biological Diversity to the National Conservation Strategy', Campbell, A. C., et al, 1988. The Contribution of Wildlife to the Economy of Botswana, Botswana Dept of Wildlife and National Parks, F.G.U., 1988.

Footnotes:

- *1 The estimates displayed are derived from a wide variety of sources. They relate solely to the annual flow of benefits. Changes in the capital value of the resource are not included. The estimates need to be regarded as preliminary indicative figures.
- *2 These include Mokola Palm, Mophane Worm, Grapple, Phane, Silk Cocoons, Thatching grass.
- *3 In addition, the tourism related craft industries provide at least 3,500 jobs.
- *4 Includes commercial cropping, game farming, game ranching.
- *5 The source of the Gross Output figures displayed is primarily the National Accounts of Botswana, 1984-85, C.S.O, M.F.D.P. The main exceptions are:- the figure for Veld Products subsistence, which is a conservative estimate; the rural figure for Woodfuels which is quoted from "A Study of Energy Utilization and Requirements in the Rural Sector of Botswana MMRWA, 1985.
- *6 The source of the Employment figures displayed is the National Accounts of Botswana, 1984-85.

TABLE 2: COMPARISON OF WATER DEMAND AND WATER RESOURCE YIELD FIGURES

<u>Present Position: 1987 Actual</u>		<u>Notes</u>
<u>Demand By</u>	<u>Million m³</u>	
Urban Settlements* ¹	21	* ¹ The average per capita consumption, in the case of the total urban population of c.210,000 people, is 277 litres per day. This include commercial, institutional and industrial water within the water works areas.
Major Villages * ²	5	
Rural Villages and Lands * ³	4	* ² The major village population of roughly 240,000 people has an average per capita consumption of 57 litres per day.
Sub-Total Domestic Use	30	
Mines and Energy	17	* ³ The rest of the population, totalling c.680,000 has a per capita consumption of only between 10-18 litre per day.
Livestock	48	
Total (excluding irrigation) * ⁴	96	* ⁴ The table does not include irrigation water. Present annual use is about 35 million m ³ .
	==	
<u>Water Resources Yield</u>		* ⁵ The water demand projections for 2007 are only indicative estimates. Future water demand will depend on a number of factors. Demand projections will be an essential part of the forthcoming National Water Master Plan Project (NWMP).
Surface Water (Gaborone and Shashe Dams)	32	
Ground Water	63	* ⁶ The NWMP will assess if, how and to what extent irrigation water can be made available from the limited national water resources. If 20% of Botswana's grain requirements were to be produced using irrigated agricultural techniques, the water demand for irrigation alone in 2007 would be of the order of 215 million m ³ .
Total (excluding irrigation)	95	
	==	* ⁷ The water resource yield projections for 2007 are no more than initial estimates, concerning the surface water resources which are expected to be available then.
<u>Forecast Position: 2007 Estimates*⁶</u>		
<u>Demand By</u>	<u>Million m³</u>	
Urban Settlements* ¹	89	* ⁸ The figures indicate a surplus of some 27 million m ³ in 2007. During the subsequent 15-20 years it is expected that alternative sources, involving either the construction of further dams or abstraction/transfer from one of the main Southern African river systems, will need to be harnessed.
Major Villages * ²	18	
Rural Villages and Lands * ³	11	
Sub-Total Domestic Use	118	
Mines and Energy	25	
Livestock	58	
Total (excluding irrigation)* ⁶	201	
	==	
<u>Water Resources Yield: 2007 Estimates *⁷</u>		
Surface Water (Gaborone, Bokaa and Shashe Dams, DS 32/33, DS 18)	140	
Ground Water	88	
Total (excluding irrigation)	228* ⁸	

Source: DWA, August 1988

**ANNEX 3: LIST OF ORGANIZATIONS PARTICIPATING IN THE BNCS
PREPARATION**

Central Government Organizations

The Ministry of Presidential Affairs and Public Administration
The Ministry of Agriculture
The Attorney General's Chambers
The Ministry of Commerce and Industry
The Ministry of Education
The Department of External Affairs
The Ministry of Finance and Development Planning
The Ministry of Health
The Ministry of Labour and Home Affairs
The Ministry of Local Government and Lands
The Ministry of Mineral Resources and Water Affairs
The Ministry of Works, Transport and Communications

Parastatal Organizations

Botswana Meat Commission
University of Botswana
National Institute of Research
Botswana Technology Centre
Water Utilities Corporation

Local Government Organizations

The North West District Council
The Ghanzi District Council
The Central District Council
The North East District Council
The Kweneng District Council
The Kgatleng District Council
The Kgalagadi District Council
The Southern District Council
The South East District Council
The Gaborone City Council
The Francistown Town Council
The Lobatse Town Council
The Jwaneng Town Council
The Selibi Phikwe Town Council

Non-Governmental Organizations

The Botswana Society
The Bird Club
The Forestry Association of Botswana
The Kalahari Conservation Society
The Natural Resources Conservation Society of Botswana
Thusano Lefatsheng
Chamber of Commerce and Industry
National Youth Council
Ministers Fraternal

International Organizations

The World Conservation Union (IUCN)
The United Nations Environmental Programme (UNEP)
The European Economic Council (EEC)
The Netherlands Government
The Royal Norwegian Development Corporation (NORAD)
The Swedish International Development Agency (SIDA)
The United States Agency for International Development (USAID)
The United Nations Development Programme (UNDP)