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BOTSWANA: 118/119 BIODIVERSITY AND TROPICAL FOREST ASSESSMENT

Final Report

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BOTSWANA: 118/119 BIODIVERSITY AND TROPICAL FOREST ASSESSMENT

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ACRONYMS

CBNRM	community-based natural resource management
CBO	community-based organization
DWNP	Department of Wildlife and National Parks
FAA	U.S. Foreign Assistance Act
FAO	United Nations Food and Agriculture Organization
GDP	gross domestic product
GEF	Global Environment Facility
IUCN	World Conservation Union
NAP	National Action Programme
NGO	nongovernmental organization
OKACOM	Okavango River Basin Water Commission
PEPFAR	President's Emergency Plan for AIDS Relief
SADC	Southern African Development Community
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID/SA	USAID Southern Africa Regional Office
WMA	wildlife management area

EXECUTIVE SUMMARY

The USAID/Africa Bureau as part of the Biodiversity Analysis and Technical Support program commissioned this report. The program provides analytical and technical assistance to USAID/Africa and supports its operating units in the design and implementation of activities in Africa in a manner that conserves natural resources and biodiversity, including tropical forests and other critical habitats.

Okavango Delta — the World's Largest Inland Delta — has a Unique Ecosystem

Source: www.ramsar.org

The report fulfills requirements under Sections 118/119 of the U.S. Foreign Assistance Act (FAA). The act requires all USAID operating units to include in their country plans an analysis of actions needed to conserve biological diversity and tropical forests, and the extent to which current or proposed USAID actions meet those needs. Non-presence USAID countries, like Botswana, are not required to conduct these assessments, but such an assessment can provide important advice and help guide future programs

This report is designed to help formulate USAID foreign assistance strategy to Botswana during the coming year and to plan for biodiversity and forest conservation concerns in the medium- to long-term.

The assessment includes an overview of natural resource management in Botswana and the environmental factors that influence that management; a discussion of legislative and institutional structures in Botswana that affect biodiversity; a summary of the status of natural resource management in the country; an analysis of major threats to biodiversity conservation in Botswana; and proposed actions and recommendations for USAID planning, including how proposed activities in the operational plan for USAID assistance could contribute to conservation needs.

Botswana has a semi-arid to arid climate and is dominated by the Kalahari Desert, which covers 80 percent of the country. Shrub-like vegetation, sparse savannah, open woodlands, and dry deciduous forests cover 60 percent of the country, including portions of the Kalahari. Botswana's forests and woodlands, although a small percentage of the land base, represent an important natural resource in terms of providing wildlife habitats and providing the rural population with an energy source (firewood), fencing, building materials, and livelihood. Water is scarce most of the year. Only 2.5 percent of the land area is water, precipitation is undependable, and the country is prone to regular drought.

Since its independence in 1966, Botswana has had the fastest-growing economy in the world. Botswana has transformed itself from being one of the poorest countries in the world in the middle of the 20th century, to being a middle-income country with a per

capita gross domestic product (GDP) of $11,000 in 2006.[1] Although rapid economic growth has led to higher per capita incomes, wealth is unevenly distributed among urban and rural households.

Mining, predominately diamonds, dominates Botswana's economy. Diamond mining is 50 percent government-owned and generates about half of government revenue. Tourism also plays a large role in the economy, because of the quantity and quality of national parks and game reserves.

The population stands at more than 1.8 million, with a growth rate of 1.5 percent in 2007. The average population density is low; however, as the population increases, there will be increased land conversion of wild lands to meet people's needs and more pressure on natural resources, especially if some traditional practices are not changed. Population and economic growth in Botswana have increased the demand for food, wood, and space for settlements, putting pressure on natural resources.

Botswana traditionally managed natural resources through the system of tribal chiefs. However, as the population grew and the demand for resources rose, land boards were established. Eventually, tribal lands were zoned for various uses and the government established ministries and departments to inventory rangelands and forests and to develop plans for sustainable management of the land and its natural resources.

Community-based natural resource management (CBNRM), an incentive-based conservation and development model that is implemented by and for people who live with and directly depend on natural resources, was launched in Botswana in 1990. The objective of CBNRM in Botswana is the sustainable use of natural resources to alleviate poverty in rural areas. CBNRM may be a critical part of natural resource and biodiversity conservation if it can help improve the standard of living in rural areas and if it can produce a strong desire for sustainable management of local resources in local communities.

Botswana has a diversity of animal species. Wilderness areas support high densities of mammals, making Botswana one of the last refuges for species requiring large areas (e.g. elephant and wild dog). Twenty-six species of mammals in Botswana are protected under the Wildlife Conservation and National Parks Act of 1992. Five species are globally threatened: wild dog, black rhinoceros, square-lipped rhinoceros, brown hyena, and cheetah. The African elephant, which is endangered in many other countries, occurs in huge herds in Botswana. The World Conservation Union's (IUCN) Red List includes one species in Botswana as critically endangered (black rhinoceros), one as endangered (wild dog), and 16 as vulnerable. Although wildlife use is strictly controlled by the government, the quantity and variety have rapidly declined in the last decades.

The greatest threats to natural resources in Botswana are human-related. One socioeconomic factor driving negative effects on natural resources is a change in settlement patterns. As the population becomes more sedentary and less transitory,

[1] Source: https://www.cia.gov/library/publications/the-world-factbook/geos/bc.html

unbalanced and increased pressure on natural resources has grown. In a study of degraded areas throughout the country, the more severely degraded areas were associated with high human and animal population densities.

Threats to natural resources and biodiversity in Botswana, and hindrances to sustainable natural resource management include the following:

- Rangeland degradation, which leads to bush encroachment
- Soil and wind erosion
- Loss of grazing habitat, which ultimately contributes to desertification
- Deforestation resulting from uncontrolled use
- Population growth and human encroachment, which result in land conversion and over-exploitation of wild animals and fuel wood
- Disruption of wildlife migration corridors due to cattle fencing
- Water pollution and decreased surface fresh water
- Human/wildlife conflicts resulting from livestock predation and crop-raiding by wild animals
- Bush fires
- Illegal hunting/gathering

In Botswana, as in most of southern African, drought and desertification is a major macro-level threat. It is always in the background. Taking into account the possible long-term impact of persistent drought and desertification, it is clear that the problem almost defies management; what is necessary is adaptability. The threats of land degradation, population pressure, and water resource damage make Botswana less adaptable to the long-term impact of climate change.[2]

Botswana has experienced 12 drought years in the past 22, on a regular, cyclical basis. Water management is critical, as groundwater and river basin watersheds are threatened. Even without climate change, Botswana and other southern African countries face a growing water crisis. Six countries were water-stressed or facing chronic scarcity in 2005 and the situation is expected to worsen significantly by 2025. Water resources in Botswana are equally important for people, wildlife, and the ecosystem as a whole.

The country has been hit hard by AIDS and has the second highest HIV infection rate in the world. The pandemic presents a severe challenge for Botswana, threatening to undo many social and economic gains. With a 24 percent prevalence rate among adults aged 15-49 years and 33 percent among pregnant women, there is potential for Botswana's productive age classes to be severely affected, producing a significant loss of staffing, workforce, and knowledge. In addition, the cost of providing health care and supporting single income families and orphans could be a major setback for the economy. Ultimately, when economic conditions worsen, the enthusiasm for biodiversity and natural resource conservation dwindles. Natural resource conservation is not a priority for people living in poverty.

[2] Personal Communication – D. Gibson, Chemonics/IFC, December 2007

Given the prevalence of HIV/AIDS and the need for promoting economic diversification and sustaining economic development and natural resource management, USAID has the potential to make an impact on biodiversity conservation in Botswana. The following are recommendations that can be implemented at the project level by USAID.

USAID has been working to support the Southern African Development Community (SADC) and multinational river basin organizations such as the Okavango River Basin Water commission (OKACOM), to help promote long-term sustainable management of the Okavango/Kubango River Basin. This project has been important for biodiversity in Botswana and southern Africa; the Okavango/Kubango River Basin is one of the most ecologically distinctive river systems in the world. Biodiversity issues surrounding the Okavango Delta ecosystem still need to be resolved. The research suggests that USAID should continue to support programs like the Sharing Water: Towards a Trans-boundary Consensus on the Management of the Okavango River Basin initiative, which work at resolving conservation concerns in the Okavango Delta within a regional landscape.

For more than a decade, USAID has supported Botswana in developing community-based natural resource management programs. These programs are a crucial part of natural resource conservation in Botswana because they promotes economic diversification and, as the demands on scarce resources become greater, enable conservation to pay for itself by giving people an incentive to sustainably manage their natural resources. CBNRM may also be a critical factor in helping Botswana alleviate poverty and reduce income inequity. There is still a place for USAID support in implementation of CBNRM in Botswana. The communities are unable to stand on their own when it comes to community-based enterprise and, in many instances, the bulk of the revenues generated return to the government. This needs to change; if the money does not reach the communities, natural resources such as wildlife will be seen as a nuisance or something to exploit, rather than a development resource. There is also a need for enterprise development training and support to local community enterprise programs as they get started. This could be done through existing nongovernmental organizations (NGOs) and the government of Botswana or on a regional basis, because the issue of CBNRM is regional. There is still room for aid in strengthening proven enterprises (such as tourism), as well as development of less familiar enterprises such as wood-crafting, weaving, and commercial gardening. In the end, CBNRM is probably the best path to rural economic survival. It is the best economic use of the land and the best way to adapt to climate change. If expected climate change results in further aridity, the future holds little promise for most people in rural areas in Botswana. Strategic planning, incorporating equity concerns and exploiting the area's comparative resource advantages (ecotourism, veld product farming), is imperative.

There is a growing recognition that environmental issues in Botswana are common in the broader southern Africa region. For example, 15 major river basins in the region, representing more than 75 percent of the region's surface water resources, are shared by two or more nations. Regional cooperation for management of these water ecosystems is imperative if natural resource conservation and biodiversity are to be maintained.

Therefore, findings suggest that USAID should assist Botswana in managing and conserving its rich heritage of natural resources by promoting regional collaboration on trans-boundary issues that could affect biodiversity (such as trans-boundary river basin conservation and land restoration projects that help to combat land degradation and desertification).

A total of $690,000 has been requested for FY 2008 for assistance in training Botswana's military leaders through the International Military Education and Training program. Although peace and security activities are not directly tied to conservation efforts, they have important connections, with the potential to affect environmental activities. Therefore, USAID should work with organizations implementing peace and security activities and with conservation organizations. Together, these organizations can identify and target areas with the most need for security and natural resource protection.

The FY 2008 foreign aid budget calls for $79 million to increase the capacity of organizations focusing on HIV/AIDS. Botswana's people are suffering from the HIV/AIDS crisis, which is having a direct effect on conservation efforts. USAID can have a positive effect on environmental conservation through HIV/AIDS work in a number of ways: support medical training in Botswana, promote HIV/AIDS education throughout environmental conservation organizations to reduce infected employees, work with health organizations to improve natural resource management, educate families about appropriate technologies that will increase their food production while caring for the soil, and promote alternatives to over-harvesting of medicinal plants and timber.

INTRODUCTION

Botswana is a landlocked country in southern Africa, lying between Namibia to the west, Angola and Zambia to the north, Zimbabwe to the east, and South Africa. The country has one of the lowest population densities and some of the largest remaining wildlife herds in the world. Environmental issues facing Botswana include desertification, bush encroachment, over-grazing and range degradation, deforestation, water pollution and water shortage, wildlife/human conflicts, and veld fires. The map below displays some of the major cities and geographical features in the country.

Environmental Context and Natural Resource Management

Kalahari Desert Dominates Botswana

Botswana is about 600,000 km^2 in size (235,000 square miles), comparable to Kenya, France, or the state of Texas. The country has a semi-arid to arid climate, with warm winters and hot summers, and annual rainfall ranging from 650 mm in the north to 255 mm in the southwest. Botswana is predominately flat to gently rolling and is dominated by the Kalahari Desert in the southwest. The Kalahari sands cover 80 percent of the country. An estimated 6 percent of the total land area is suitable for agriculture[3]. Most production is in the eastern part of the country, where climatic and soil conditions are more favorable. Shrub-like vegetation, sparse savannah, open woodlands, and dry deciduous forest cover 60 percent of the country, including portions of the Kalahari.[4] The main forested areas are in the north and northeast. Botswana contains the world's largest inland delta — the Okavango Delta — and many pans — large shallow salty depressions — are found throughout the country. These pans fill up with water during the rainy season and provide water and sanctuary for a variety of birds and animals. Water is scarce during most of the year, accounting for only 2.5 percent of total land area. Precipitation is undependable, and the country is prone to regular drought, which probably accounts for the country's motto and the name of the currency: *pula* (rain).

Natural resources include diamonds, copper, nickel, salt, coal, soda ash (used in glassmaking and fertilizer), iron ore, silver, gold, and uranium (discovered in 2007). There is also a variety of wildlife, including leopard, lion, buffalo, giraffe, wild dog,

[3] Forestry Outlook Study for Africa
[4] Forestry Outlook Study for Africa

elephant, and many antelope species. Forests and woodlands, although a small percentage of the land base, represent an important natural resource, providing wildlife habitat, an energy source (firewood), fencing, building materials, and livelihood (such as veld products and crafts) to the rural population.

Botswana has a parliamentary republic form of government. Unlike most countries in Africa, it was never colonized, although it was a protectorate of England for almost 80 years. Since its independence in 1966, Botswana has had the fastest-growing economy in the world. Botswana has transformed itself from being one of the poorest countries in the middle of the 20th century to a middle-income country, with a per capita GDP of $11,200, in 2006. Although rapid economic growth has led to higher per capita incomes, wealth is unevenly distributed among urban and rural households.[5]

Land tenure includes freehold (3 percent), tribal (55 percent), and state (42 percent) land (1995)[6]. Freehold land is owned by an individual or group who have exclusive control over its use. Tribal land is administered through the Tribal Land Act. State land is owned by the government and is used for communal grazing, national needs such as forest reserves or national parks or is leased to individuals or groups.

As a result of relative prosperity, wise use of natural resources, and prudent fiscal policies, the government supports natural resource management.[7] This includes management of 17 percent of the land as national parks or game reserves and the addition of wildlife management areas (another 20 percent). The objective in wildlife management areas is sustainable use of wildlife and other natural resources. Botswana has also adopted an innovative decentralized natural resource management model called community-based natural resource management, which will be discussed further in this assessment.

The economy of Botswana is dominated by mining, predominately diamonds. Diamond mining is 50 percent government-owned and generates about half of government revenue. Tourism and services also play a large role in the economy, due to the quantity and quality of national parks and game reserves. The economic breakdown of gross domestic product in Botswana is industry (46.9 percent), services (50.7 percent), and agriculture (2.4 percent). Industry includes 36 percent mining.[8] The main exports are diamonds, copper, nickel, and beef.

Botswana has a population of 1.8 million, with a growth rate of 1.5 percent (2007).[9] The population is concentrated in the east, with an average density of 3 people per square kilometer. Most live on tribal lands, inheriting rights of use, entitlements to build homes, and common rights to farm or herd cattle. With the discovery of diamonds and the increase in revenue, the government has greatly increased its investment in the country's

[5] Forestry Outlook Study for Africa
[6] Forestry Outlook Study for Africa
[7] CBNRM Support Programme, IUCN
[8] CIA World Factbook
[9] Source – http://www.cia.gov/library/publications/the-world-factbook/print/bc.html

educational system. The adult literacy rate is 80 percent, with universal access to schools through grade 10, and a 90 percent attendance rate in the school population.[10]

The country has been hit hard by the AIDS epidemic and has the second-highest HIV infection rate in the world. In 2002, the AIDS infection rate was estimated at 37 percent of the sexually active population.[11] The government of Botswana began a comprehensive program to combat HIV/AIDS in 2003, and is credited with one of Africa's most advanced treatment programs. Rate-of-infection estimates in 2007 fell to 17 percent.[12]

Background on USAID Activities

For many years, Botswana had a resident USAID mission; however, in 1996, the Botswana Mission closed, along with 26 other USAID missions. Botswana is currently a non-presence country; the Southern Africa Regional Office (USAID/SA) directs support. USAID/SA covers 10 countries that are members of the Southern Africa Development Community,[13] with a focus on increasing trade and strengthening economic ties with the SADC region, mitigating the region's HIV/AIDS crisis, easing recurrent food insecurity, and strengthening democracy to improve the climate for trade and reduce the risk of conflict in the region.[14]

USAID biodiversity and natural resource management activities in Botswana in the last decade include the following:

- USAID supported development of community-based natural resource management in Botswana as part of the Natural Resource Management Project (1990-2000), working with the government of Botswana and Chemonics International. The main objective was to empower rural residents to participate in the stewardship of Botswana's rich biodiversity by using wildlife resources (tourism and hunting) and veld products.

- Since 2001, USAID has provided technical assistance and training to establish the Trans-Kalahari Corridor Management Committee. In 2003, ministers of transport in Botswana, Namibia, and South Africa signed a memorandum of understanding that binds the governments and private sector, enabling an increase in regional trade.[15]

- An initiative was launched in 2003 entitled Sharing Water: Towards a Trans-boundary Consensus on the Management of the Okavango River Basin. In this initiative, USAID/SA addresses trans-boundary water and biodiversity management issues under an over-arching agreement with SADC and works with the multinational OKACOM. Activities are implemented through the 2004-2008 Okavango Integrated

[10] USAID press release (http://www.usaid.gov/press/releases/960412b.htm)
[11] AVERT International AIDS Charity (http://www.avert.org)
[12] CIA Factbook
[13] RCSA covers Angola, Lesotho, Malawi, Mozambique, Zambia, Botswana, Namibia, South Africa, Swaziland, and Zimbabwe.
[14] Source: http://www.usaid.gov/policy/afr/rcsa
[15] More information can found at http://www.usaid.gov

River Basin Management Project. The project focuses on the Okavango River Basin, one of the most ecologically distinctive river systems in the world.[16]

- USAID recently launched a project to explore the feasibility of commercial melon farming during the winter near Gaborone. USAID is collaborating with the Botswana Horticulture Council, the Ministry of Agriculture, and local farmers.

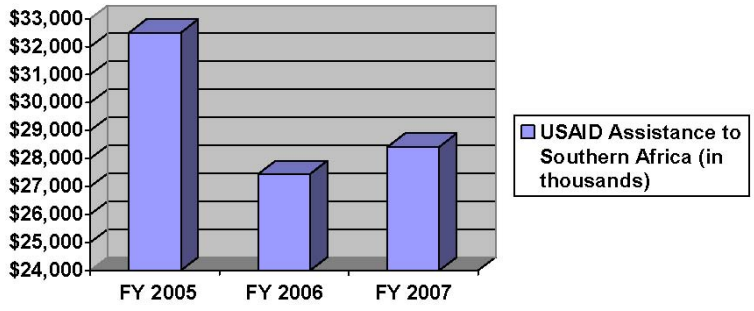
- In 2005, USAID's Southern Africa Trade Hub project helped cattle producers form a national association to represent and promote their economic interests. USAID provided technical support to create the Botswana Cattle Producers Association.

- In 2006, the U.S. and Botswana signed the first Tropical Forest Conservation Act agreement in Africa. The agreement, a USAID initiative, will reduce Botswana's debt payments to the United States by $8 million. The funds will be used to support grants that conserve and restore important tropical forests throughout the country. Forests in Botswana that are covered by the agreement include closed canopy tree cover, riverine forests, and dry acacia forests.

- Recently, under a USAID contract, the National Oceanic and Atmospheric Administration and the U.S. Geological Survey developed the Environmental Information for Natural Resource Management program. This program aims to strengthen the capacity of regional organizations, community groups, NGOs, and government natural resource management authorities in southern Africa by collecting and analyzing data and information about the region's natural resources. The focus of this activity is to provide technical assistance to the SADC Regional Remote Sensing Unit to update the regional natural resource database and enhance ecological information dissemination.

Tables 1 and 2 summarize USAID's budget in southern Africa during the last three years.

Table 1. USAID Assistance to Southern Africa



[16] More information can be found at http://www.sharingwater.net

Table 2. USAID/Southern Africa Budget Summary (in thousand dollars)

Program	FY 2005	FY 2006	FY 2007
A More Competitive Southern African Economy	5,418	5,486	5,500
Improved Rural Livelihoods	5,418	6,350	6,400
Improved Electoral Competition	2,456	0	0
Improved Management of Shared River Basins	2,023	2,203	2,240
Regional HIV/AIDS Program	17,188	12,423	12,433
Total	**$32,503**	**$27,445**	**$28,423**

Current U.S. Government Programming

In addition to USAID, many other U.S. government programs have a presence in Botswana, primarily dealing with the HIV/AIDS crisis, but also addressing poverty alleviation and economic diversification, trade expansion, regional security, and environmental protection. Current programs include the following:

- Through the President's Emergency Plan for AIDS Relief (PEPFAR), the U.S. government provided nearly $55 million in FY 2006 and just over $70 million in FY 2007 to combat HIV/AIDS in Botswana. Many government agencies contribute to PEPFAR, including the Department of Health and Human Services, the Department of State, the Department of Defense, USAID, and the Peace Corps.

- Smaller sums of U.S. foreign assistance for 2007 in Botswana included $500,000 allocated for foreign military financing and $690,000 for international military education and training under peace and security.

- The Department of Defense has contributed to infrastructure needs by committing to build 10 HIV/AIDS voluntary counseling and testing sites and a number of day care centers for orphans and vulnerable children. Funding comes through the Humanitarian Assistance Program.

- The U.S. Ambassador's Self-Help Program assists small, not-for-profit, community-run projects in Botswana. The goal of the Self-Help Program is to improve basic environmental, economic, social, and quality-of-life conditions in the communities. The program has supported counseling clinics for HIV/AIDS issues, contributed to home-based services for the terminally ill, promoted day care centers for children and AIDS orphans, purchased supplies and equipment for natural resource and environmental projects, supported income-generating efforts for local citizens, and strengthened agricultural projects in rural villages.

- From 1966 to 1997, Peace Corps projects touched nearly all aspects of Botswana's development. The program in Botswana closed in 1997, reopening in 2003 with a focus on fighting the HIV/AIDS epidemic. Peace Corps volunteers work with NGOs and district AIDS coordinators to reduce the incidence and impact of HIV/AIDS.

- The United States has assisted Botswana's competitiveness in the global marketplace through the African Growth and Opportunity Act, a law that significantly enhances U.S market access for (currently) 39 sub-Saharan African countries. The U.S. government, through this law, contributed to the growth of imports from Botswana, notably minerals, metals, and textiles/apparel.

For FY 2008, the U.S. administration is requesting $79,690,000 in the foreign operations budget for Botswana, broken down as follows[17]:

- $690,000 in peace and security, to assist in training Botswana's military leaders through the International Military Education and Training program

- $79,000,000 in investing in people, which will be used to increase the capacity of organizations with a focus on HIV/AIDS

In addition, line items in the FY 2008 budget proposal for Peace Corps ($1,676,000) and Health and Human Services ($7,600,000) would be used for HIV/AIDS support.

Rationale for a Biodiversity Assessment in Botswana

The U.S. Congress and the U.S. Foreign Assistance Act require all USAID operating unit strategic plans to include a technical environmental analysis. Sections 117, 118, and 119 of the FAA require USAID missions to examine issues of environmental impact and forest and biodiversity conservation when preparing strategies for development assistance. This assessment is designed to take into consideration FAA provisions related to:

- Section 117: Consideration of the impact of proposed activities on the environment and how to implement programs, with an aim toward maintaining and restoring natural resources upon which economic growth depends

- Section 118: Analysis of actions necessary to achieve conservation and sustainable management of forests and the extent to which actions proposed by USAID meet these needs

- Section 119: Analysis of actions necessary to protect endangered species and to conserve biological diversity and the extent to which the actions proposed by USAID meet these needs

[17] Source – http://www.state.gov

Non-presence USAID countries, like Botswana, are not required to conduct these assessments. Nevertheless, such an assessment can provide important advice and help guide programming. This assessment includes an overview of natural resource management in Botswana and the environmental factors that influence that management, a discussion of the legislative and institutional structures that affect biodiversity, a summary of the status of natural resource management in the country, and an analysis of major threats to biodiversity conservation in Botswana.

This report also examines how proposed activities in the operational plan for USAID assistance could contribute to conservation needs, and includes recommendations for actions, as well as near-term and long-term suggestions for additional programming. These additional suggestions could also be presented for consideration by other donors, depending on the future funding levels and capacity of USAID/SA. These recommendations are aimed at supporting environmental sustainability and conservation objectives in a manner consistent with USAID's strategy and in ways that help address the needs identified in this assessment.

LEGISLATIVE AND INSTITUTIONAL STRUCTURES AFFECTING BIODIVERSITY AND FORESTRY

Botswana has a parliamentary republic form of government, with a president, a multiparty system, a legislative branch (including a parliament), and a judicial branch. The parliament includes chiefs of the principal tribes, as well as elected members. The Botswana Defense Force was formed in 1977. Following positive political changes in South Africa and the region, the force's missions focus on anti-poaching activities, disaster-preparedness, and foreign peacekeeping.

Botswana is divided into nine districts, which are divided into 28 sub-districts. It is administered by central government, district councils, land boards, and tribal authorities. Land use planning is initiated at the district level.

Traditionally, all land is tribally owned. Most of the population live on tribal lands, inheriting rights of use that cannot be sold, entitlement to build homes and to plow, and common rights to herd cattle.[18] Natural resources may be used for personal consumption.

Although poverty has been falling, it remains common. A recent household income and expenditure survey showed that absolute poverty fell from 46.7 percent in 1993-1994 to 30.3 percent in 2002-2003.[19] The same survey, however, showed an increase in income inequality.

Botswana's Nine Districts

Source: http://en.wikipedia.org/wiki/Botswana

Botswana possesses diversity and an abundance of wild fauna and flora, and the government has demonstrated a commitment to maintaining the country's rich heritage by setting aside national parks, game reserves, and wildlife management areas. In the past, the government has recognized the need to include environmental issues, such as conservation of the biodiversity in the planning and policy formation process, to achieve sustainable development.

[18] IUCN. *The Nature of Botswana*. 1990.
[19] IUCN. *Case Study of the CBNRM Programme in Botswana. 2006*

Agreements, Conventions, and Treaties Related to the Environment

Botswana is party to several international agreements, conventions, and treaties on the environment, including the United Nations Convention on Biological Diversity — known as the Rio Treaty. Since joining, Botswana has addressed Article 6 in the convention, which requires drafting and implementation of a strategic action plan. In 2002, Botswana began a National Biodiversity Strategy and Action Plan, which was completed in 2004, and revised in 2007. Botswana has also prepared and submitted to the Conference of the Parties four National Reports (1998, 2001, 2005, and 2007).

Other international environmental conventions in which Botswana is involved are:

- United Nations Framework Convention on Climate Change (Kyoto Protocol)
- United Nations Convention to Combat Desertification (UNCCD)
- Convention on International Trade in Endangered Species
- Convention on Wetlands of International Importance (Okavango Delta)
- United Nations Commission for Environment and Development (Agenda 21)
- Bonn Convention on Migratory Species of Wild Animals
- Basel Convention on Hazardous Wastes
- Cartagena Protocol on Bio-safety
- Stockholm Convention on Persistent Organic Pollutants
- Vienna Convention for the Protection of the Ozone Layer
- Montreal Protocol on Substances that Deplete the Ozone Layer
- World Heritage Convention
- World Trade Organization
- European Free Trade Association

Legislation Related to the Environment

Since Botswana's independence in 1966, the government has put in place a number of policy documents and laws geared toward sustainable development, conserving natural resources, and maintaining biodiversity. The primary aim is to improve the standard of living and to conserve the environment for future generations.[20] Legislation related to the environment includes:

- *Tribal Land Act (1968).* Set up land boards to allocate and manage communal lands.
- *Water Act (1968).* Defines water use rights and pollution controls and penalties (as amended).
- *Forest Act (1968).* Provides for regulation and protection of forests and forest products.
- *Agricultural Resources Conservation Act (1974).* Conservation and improvement of agricultural resources, including soils, water, flora, and fauna.

[20] Botswana National Report on implementation of UNCCD: www.unccd.int/cop/reports/africa

- *Fish Protection Act (1976).* Provides for conservation and sustainable exploitation of fish.
- *Herbage Preservation Act (1977).* Prevention and control of bush and other fires.
- *Diseases of Animals Act (1977).* Provision is made to prevent and control diseases affecting animals, including regulating the movement of animals.
- *Forest Act (1986).* Revised policy for sustainable forest management.
- *Wildlife Conservation Policy (1986).* Describes government policy on the wildlife resource and tourism.
- *National Conservation Strategy/National Policy on Natural Resources Conservation and Development (1990).* A key policy document that addresses pressure on water resources, degradation of rangeland pasture, depletion of wood resources, exploitation of veld products, pollution, population pressure, and depletion of wildlife resources.
- *Tourism Policy (1990) and Tourism Act (1992).* Address wildlife and tourism.
- *Wildlife Conservation and National Parks Act (1992).* In conjunction with the Wildlife Conservation Policy of 1986, the National Conservation Strategy, and the Tourism Policy of 1990, provides the base for a comprehensive wildlife conservation program. This act also established the Central Kalahari Game Reserve.
- *Community Based Strategy for Rural Development (1997).* Addresses rural development and poverty alleviation.
- *National Action Programme (1997).* This is a tool for operationalizing implementation of the objectives of the UNCCD.
- *Revised Policy for Rural Development (2002).* This is a policy of community-based natural resource management.
- *The National Ecotourism Strategy (2003).* A strategy for managing ecotourism in Botswana to stimulate economic development in remote, rural areas, while minimizing negative social, cultural, and environmental impact.
- *Income Tax Act (2004).* Allows farmers to claim against capital costs for prevention of soil erosion, planting of trees, construction of firebreaks, etc.
- *Botswana National Biodiversity Strategy and Action Plan (2004, revised 2007).* Developed as part of the implementation for the Conference on Biodiversity.
- *Environmental Impact Assessment Act (2005).* Establishes and strengthens the environmental impact assessment decision-making process.
- *Agricultural Resources Regulations (2006).* Regulations for harvesting veld products.
- *Draft CBNRM Policy (2007).* Government policy/strategy for community-based natural resource management.
- *National Development Plans.* Long-range plans, developed internally for Botswana, which address many environmental issues (e.g. NDP 9 for 2003-2008).

Institutions Related to the Environment

Most government institutions in Botswana are involved, at some level, in environmental planning and natural resource management. Following is a list of ministries and departments directly involved in environmental matters and biodiversity-related decisions.[21]

[21] For additional information on these and other institutions in the Botswana government: http//www.gov.bw.index2

Ministry of Environment, Wildlife and Tourism

- Department of Wildlife and National Parks (DWNP)
  - Responsible for conservation and sustainable management of wildlife populations
  - Lead agency for wildlife-based CBNRM projects; recently established a Community Services Division as an umbrella organization for the Botswana Community-Based Organization Network
  - Coordinates with the livestock sector and tourism industry
  - Administers the national parks
  - Includes a Fisheries Division, for the sustainable use and management of Botswana's fisheries resource

- Department of Environmental Affairs
  - The National Conservation Strategy Coordinating Agency is in this department
  - Established as the focal point for development of the National Action Programme (NAP) to combat desertification and drought

- Department of Tourism
  - Responsible for the improvement, development, and diversification of tourism, particularly ecotourism and CBNRM activities
  - Manages programs to create an enabling environment for conservation, sustainable use, and management of resources
  - Objectives include the mutual benefit of local and national economies, livelihoods, and poverty alleviation

- Department of Meteorological Services
  - Works with other government institutions on climate issues and the national program to combat desertification

Ministry of Agriculture

- Department of Crop Production and Forestry
  - Develops and implements the national forest policy, which defines goals for conservation, development, and management for sustainable use of forestry resources
  - Responsible for conservation of endemic and indigenous plants
  - Implementing agency for community-based rangeland management projects
  - Responsible for Fire Management Plan

- Department of Animal Health and Production
  - Responsible for sustainable management of livestock

- Lead agency for disease control measures, including veterinary fences

- Department of Agricultural Research
  - Involved in research and development of technologies to increase food production and food security within a framework that meets environmental concerns and conserves agricultural and land resources for future generations

Ministry of Finance and Development Planning

- Rural Development Coordination Division
  - Responsible for implementation of the community-based Rural Development Strategy and Rural Development Policy (CBNRM))
  - Involved in implementation of the UNCCD
  - Responsible for implementing the Remote Area Development Program, which deals with rural development and poverty alleviation.

Ministry of Mines, Energy and Water Resources

- Department of Water Affairs
  - Responsible for development and management of all water resources, including sustainable water resource management, which ensures the well-being of the population and the natural environment

Major Nongovernmental Organizations Working in Botswana

International

World Conservation Union. IUCN provided advice and strong assistance in preparation of Botswana's National Conservation Strategy. It also has been a major supporter for implementation of CBNRM, and has funded multiple regional biodiversity studies. IUCN includes related structures such as the African Elephant Support Group, which has contributed to conservation efforts in Botswana.

Private Agencies Collaborating Together. An organization of U.S. private and voluntary organizations working in relief and development assistance, this NGO has worked extensively within Botswana on projects tied to CBNRM.

The African Wildlife Foundation. An international conservation organization that has prioritized critical landscapes for preservation. The largest conservation landscape extends across Botswana, Namibia, Zambia, and Zimbabwe. This NGO has helped support large carnivore research projects in Botswana and has contributed to CBNRM (e.g. Santawani Community Ecolodge).

Africa Biodiversity Collaborative Group. A group of seven international, U.S.-based conservation NGOs whose goal is to work collaboratively to ensure that African natural resources and biodiversity are securely conserved in balance with sustained livelihoods.

The WILD Foundation This organization's focus is on wilderness protection. It has helped fund various projects in Botswana and recently funded a study commissioned by the Kalahari Conservation Society on large-scale use of veterinary fences.

Wildlife Conservation Society. This society is helping to implement the Botswana Wild Dog Project, a monitoring project for the endangered wild dog population in the Okavango Delta.

International Institute for Sustainable Development. A Canadian non-profit organization that works with the government of Botswana, the United Nations Development Programme (UNDP), and others on environmental projects, including the Indigenous Vegetation Project (rangeland monitoring and management).

Regional

Kalahari Conservation Society. This organization, the oldest NGO in Botswana, has been involved in the ecological zoning of the Okavango Delta and development of management plans for game reserves and national parks, has established anti-poaching units, facilitated and assisted CBNRM projects, conducts ecological studies on species of wildlife, and is involved in environmental education.

Forestry Association of Botswana. Works with seed collection, nursery development, planting, and school programs to promote ecologically sound forest management.

The Botswana Society. A scientific association that reports, debates, collates, and disseminates findings of recent research.

Veld Products Research. Involved with projects related to veld products.

Thusano Lefatsheng. Involved in ecological studies, cultivation, and management of the grapple plant (*Harpagophytum procumbens*).

Chobe Wildlife Trust. Assists with conservation of natural resources in Chobe National Park and the region as a whole.

BirdLife Botswana. Involved in education and outreach, research, and conservation. Monitors threatened birds, including the wattled crane in the Okavango Delta.

Donor Organizations

Numerous international donors contribute to Botswana's environment, including the following.

United Nations Programs.

- *United Nations Development Programme.* UNDP has taken an active role in improving environmental management. UNDP has helped with implementation of the National Conservation Strategy and the National Action Programme to combat desertification. UNDP and the United Nations Environment Programme (UNEP) provide support (usually through the Global Environment Facility) for regional projects that fight desertification, including projects in Botswana.

- *United Nations Environment Program.* UNEP has assisted in developing solutions to Botswana's most serious environmental problems. This included a proposal for Botswana to prepare a national conservation strategy.

- *United Nations Educational, Scientific, and Cultural Organization.* This organization has been involved in developing a national information and communication technology policy in Botswana.

- *United Nations Food and Agriculture Organization (FAO).* This organization has been involved in fisheries research and management, and research on farm animal genetics.

- *International Fund for Agricultural Development.* It has supported several projects aimed at helping small-scale subsistence farmers.

The Global Environment Facility (GEF). The GEF funds support projects in Botswana in biodiversity conservation, global warming, international waters, and ozone depletion. GEF has provided funds for CBNRM, seed banks, botanical research, wildlife research projects, solar-powered boreholes, environmental education, electric fence construction, plant herbariums, development of a rhinoceros sanctuary, and projects on alternative energy sources. GEF is also contributing funds toward the Integrated Okavango River Basin Hydro-Environmental Project, a regional project involving Botswana.

The World Bank. It collaborates with the Botswana Development Information Center to promote information-sharing aimed at improving the effectiveness of development programs in Botswana.

International Monetary Fund. Has worked with the government and has recently expressed a desire to work with Botswana to reach the country's Millennium Development Goals.

International Aid.

- United States

- Denmark
- Norway
- United Kingdom
- Sweden
- Germany
- Canada
- European Union
- African Development Foundation

Regional Initiatives

Most conservation issues that Botswana faces are common to other countries in southern Africa, particularly adjacent countries with similar habitats. Social and political boundaries are arbitrary for wildlife; several habitats that are important to biodiversity occur across country boundaries (such as the Okavango River Basin). Addressing conservation issues on a regional scale is imperative.

Botswana is a founding member of the Southern African Development Community, an alliance of majority-ruled states in Southern Africa. SADC recently completed a regional biodiversity strategy with funding from GEF, administrative oversight from the UNDP, and technical support from IUCN. The strategy provides a framework for cooperation on biodiversity issues that transcend national boundaries. The strategy is built on the values of biodiversity, constraints to biodiversity conservation, and its sustainable use in the region.

SADC projects involving environmental issues in Botswana include environmental impact assessment development, a plan of action for the Kalahari, the Land Degradation and Desertification Control Programme, environmental monitoring, and Environmental Education Progamme funding. As part of SADC's goal for regional cooperation in natural resource management, its member states, including Botswana, have signed and/or ratified a number of biodiversity-related protocols:[22]

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

[22] Southern African Development Community "Regional Biodiversity Strategy"

Botswana is a member of the Southern African Customs Union, which works to maintain the free interchange of goods among its five member countries; collects levies from customs, sales, and excise; then shares out the proceeds, based on each country's share of imports. Botswana is also a member of the African Union, an organization of 53 African states whose goal is to secure democracy, human rights, and sustainable economies. The African Union developed the African Convention on the Conservation of Nature and Natural Resources, which Botswana signed in 1968.

The most crucial trans-boundary issues in Botswana, and southern Africa as a whole, are water- and range-related, including desertification. The following regional initiatives and/or projects focus on these natural resource threats.

Integrated River Basin Management Project (IRBM): Towards a Consensus on Trans-boundary Management of the Okavango River Basin. To manage the Okavango/Kubango River Basin, one of the most ecologically distinctive river systems in the world, the three riparian countries — Angola, Namibia, and Botswana — formed the Okavango River Basin Water Commission in 1994. The Sharing Water initiative was launched in 2003 with funding from USAID/RCSA. The goal is to promote joint fact-finding through a shared data-management system and a transparent, decision-making model, broaden stakeholder participation in OKACOM, build capacity in the region to analyze complex scenarios and management strategies, and promote long-term sustainable management of the Okavango/Kubango River.

A GEF-supported regional biodiversity project implemented by UNDP and UNEP is the **Management of Indigenous Vegetation for the Rehabilitation of Degraded Rangelands in the Arid Zone of Africa Project.** This project links communities and governments to promote long-term land management and wildlife preservation in Botswana, Kenya, and Mali. As part of this project, villages in southern Botswana adjacent to the Kalahari Desert are attempting to stop the advance of sand dunes by cultivating them. Communities are rehabilitating arid rangelands that have been over-grazed or over-cultivated. The goal is to conserve local resources, including wildlife; products such as firewood, grass for grazing and thatching, medicinal plants like devil's claw that are sold to European markets; and native plants used for food. This project has the potential to demonstrate that community management of rangelands is viable.[23]

Agreement of the Action Plan for the Environmentally Sound Management of the Common Zambezi River System. The objective of this initiative, signed in 1987, is to coordinate sound management of the water resources and environment of the common Zambezi River System.

Other regional efforts that Botswana participates in to combat desertification include the **Subregional Action Programme, the Desert Margins Programme, and the Kalahari-Namib Trans-boundary Project.[24]**

[23] Source: http://www.afrol.com/articles/13090
[24] Botswana National Report on the Implementation of the United Nations Convention to Combat Desertification (2004)

STATUS AND MANAGEMENT OF NATURAL RESOURCES

Rock paintings, place names, and oral history in Botswana describe a country of tall trees, large animals, and open plains. Diaries of 19th century travelers (1826) similarly describe magnificent trees, permanent springs, open plains, and endless herds of animals.[25] By the mid-1900s, wild herds had declined and large trees and some wildlife species (rhinoceros) were absent from the landscape. Fortunately, Botswana realized what was happening and had the will and the way to rectify the situation. Botswana, unlike many other countries in Africa, has had the civil and economic stability to prepare management plans, biodiversity strategies, and environmental impact analyses.

General Status and Management of Natural Resources

Botswana has traditionally managed natural resources through the system of tribal chiefs: local authorities managing the affairs of the community.[26] As the population increased and the demand for resources grew, land boards were established. Eventually, tribal lands were zoned for various uses (Tribal Grazing Land Policy, 1975) and the government set up ministries and departments to inventory rangelands and forests and to develop plans for sustainable management of the land and natural resources.

The district land-use planning system is well-established. The land-use planning units prepare district land-use plans, which include land allocations. The major categories for land allocation include villages (residential), mixed farming (arable with limited livestock), and grazing areas. Grazing areas are subdivided into private grazing land (leasehold), borehole-dominated livestock grazing, and wildlife management areas, which will be discussed further under the Protected Areas discussion.

The government is committed to ensuring that development and diversification of the country's economy is predicated on the sustainable use of natural resources. The government's National Development Plan has a theme of "sustainable economic diversification." Wildlife is an important natural resource in Botswana and a key alternative to the country's dependence on minerals — in the form of tourism.[27] It is estimated that 90 percent of all tourists come primarily for a wildlife-based vacation.[28] The majority visit national parks and game reserves. Botswana is the third most popular tourist destination in southern Africa, and ecotourism plays a large role in the Botswana economy.

In the past, wildlife was freely accessible, but the government has begun attempting to control wildlife use. Hunting is subject to licenses whose fees are set by the government and differ for citizens, residents, and non-residents. Each year, after wildlife counts, hunting quotas are set. Although the system is a good start, there are still problems. For example, to resolve conflicts between wildlife and humans, so-called problem animals may be shot without a license. For certain species, the number of problem animals killed

[25] IUCN. *The Nature of Botswana*. 1990.
[26] Botswana National Report on the Implementation of the UNCCD, 2004
[27] Forestry Outlook Study for Africa, Botswana
[28] Botswana Tourism Master Plan 2000

exceeds the quota, which reflects the sustainable harvest rate. The system has other problems as well; few licenses are returned as required, licenses that are returned have probably been used several times, and there is inadequate control of poaching.[29]

In terms of biodiversity, Botswana possesses several distinctive ecosystems with a diversity of flora and fauna. The most distinct systems include the Okavango Delta, a Ramsar site, and the largest inland delta in the world; the Makgadikgadi and Nxai pans, remnants of a huge, prehistoric lake; the Chobe River Basin; and the Kalahari Desert. These ecosystems are globally important because they help support large populations of elephants and other large mammals, as well as a rich diversity of bird species.

The National Biodiversity Strategy and Action Plan for Botswana identifies seven distinct eco-regions throughout the country. These are Zambezian Flooded Grasslands, Zambezian Halophytics, Zambezian and Mopane Woodlands, Kalahari Acacia, Kalahari Xeric Savanna, South African Bushveld, and Zambezian Baikiaea Woodlands.[30] As described in the action plan, four of these eco-regions are vulnerable: South African Bushveld (deforestation, overgrazing, range degradation, and veld fires), Zambezian Baikiaea Woodlands (cattle overgrazing and change in vegetative communities), Zambezian Halophytics (mining, rangeland degradation, fires, wind erosion, fencing, increased salinity of surface water, decreased surface fresh water, lack of protection for critical avian breeding sites, and wildlife conflicts), and Kalahari Acacia (increased cattle ranching, land transformation and degradation, fires, fences, poaching, and invasive alien species). The action plan states that the status of the rest of the eco-regions is stable and intact.[31]

Primary world ecosystem types found in Botswana include:

- Major wetland: 4 percent
- Desert and semi-desert: 66 percent
- Grass and shrub: 5 percent
- Interrupted woods: 22 percent
- Major forests: 3 percent

Flora

Although there has never been a comprehensive survey of plants in Botswana, there are an estimated 2,600 to 3,000 species, representing some 128 botanical families. The richest floral areas are in the north, particularly within the Okavango and Chobe River systems. Also of interest are numerous wild edible plants, which rural residents make considerable use of. More than 250 edible plant species have been recorded. The country also has several plant species with commercial potential: the grapple plant, the Kalahari truffle, Hodia, and thatching grass.

[29] Source: http://www.bangor.ac.uk/rangelands
[30] For more information on eco-regions, reference http://www.iucn.org
[31] Botswana 3rd National Report on the Implementation of the Convention on Biodiversity, 2005.

Botswana has only 43 Red Data plant species: 3 of which are endangered, 10 vulnerable, 8 near threatened, and 17 endemic to southern Africa.[32] There is a lack of information on flora in terms of available data, distribution of species, and varieties. This lack of knowledge on diversity, status of some species, and critical habitats complicates the biodiversity conservation effort.

Fauna

The wide range of habitats — from arid dunes to permanent swamps — is reflected in a great diversity of animal species. Vast wilderness areas support high densities of mammals, making Botswana one of the last refuges for species requiring large areas (e.g. elephant and wild dog). Botswana has a rich and diverse mammalian fauna with 162 identified species, including 39 taxa of hoofed mammals, 38 taxa of carnivores, and 7 taxa of primates. Most large mammals are in the western part of the country, with a greater diversity in the northwest. Mammalian numbers in the east have declined, because of displacement by human settlement and its associated activities. Twenty-six species of mammals in Botswana are protected under the Wildlife Conservation and National Parks Act of 1992. Five of these species are globally threatened: wild dog, black rhinoceros, square-lipped rhinoceros, brown hyena, and cheetah. The African elephant, considered endangered in many countries, occurs in huge herds in Botswana.

Fauna	Number of Species
Mammals	162
Birds	570
Reptiles	131
Amphibians	34
Fish	99

According to the Botswana Bird Atlas, there are 570 bird species, although only one is endemic. Of these species, 21 are protected and six are considered globally threatened: wattled crane, cape griffin or vulture, peregrine falcon, black-cheeked lovebird, slaty egret, and lesser kestrel. The ostrich, the largest bird in the world, has adapted to the changing environment in Botswana and is seen almost everywhere.

There are 99 fish species, found primarily in large permanent rivers: the Limpopo and Chobe-Linyanti-Kwando systems, and the Okavango Delta. A total of 34 amphibian species and 131 reptile species (3 endemic) are found in Botswana. Invertebrate species richness is extraordinary, but still largely under-described.[33]

As described for the flora resource in Botswana, there is also missing information on the fauna in terms of available data. This lack of knowledge on diversity, distribution of species, status of some species, and critical habitats, complicates the conservation effort of biodiversity in the country.

[32] Red Data List, http://www.iucn.org
[33] Botswana 3rd National Report on the Implementation of the Convention on Biodiversity, 2005.

Community-Based Natural Resource Management

Community-based natural resource management is an incentive-based conservation and development model implemented by and for people who live with and directly depend on natural resources, and who therefore have the greatest impact on natural resources. In this model, communities are given rights of access to wild resources and legal entitlements to benefits that accrue from using the resources. The CBNRM model is intended to create positive social and economic incentives for people to invest their time and energy in natural resource conservation. Botswana's CBNRM program was launched in 1990 through the Natural Resource Management Project, funded by USAID and the government of Botswana, and implemented by the Department of Wildlife and National Parks and Chemonics International. The CBNRM projects are based on the use of wildlife resources (tourism and hunting), veld products, and rangelands for rural development. The objective of CBNRM in Botswana is the sustainable use of natural resources to alleviate poverty in rural areas. The main beneficiary is intended to be community-based organizations.

In 1999, IUCN-Botswana began a program to offer support and advice to CBNRM projects and community-based organizations. CBNRM may be a critical part of natural resource and biodiversity conservation in Botswana if it can help improve the standard of living in rural areas and produce a strong desire for sustainable management of local resources in local communities.

In Botswana, CBNRM is administered through the National Conservation Strategy Coordinating Agency, with assistance from the UNDP and other agencies and organizations. CBNRM projects cover nine districts, more than 120 villages, and over 100,000 inhabitants. Examples of CBNRM projects include: The Lehututu Community-Based Natural Woodland Management Project, Rakops Tree Planting Project, Matsiloje Land Reclamation and Agro-forestry Project, Mokobeng Agro-forestry Woodlot, and natural resources based livelihood strategies in the villages of East Hanahai, Paje, and West Hanahai.[34]

Threats to Natural Resources

The greatest threats to natural resources in Botswana are human-related. Botswana is a semi-arid country with a fragile ecosystem that is susceptible to land degradation. A study of degraded areas throughout the country found that in all cases the more severely degraded areas were associated with high human and animal population densities. Results of this study described 31 percent of the land area as having no land degradation, 57 percent with light to moderate degradation, and 11 percent with severe to very severe land degradation.[35]

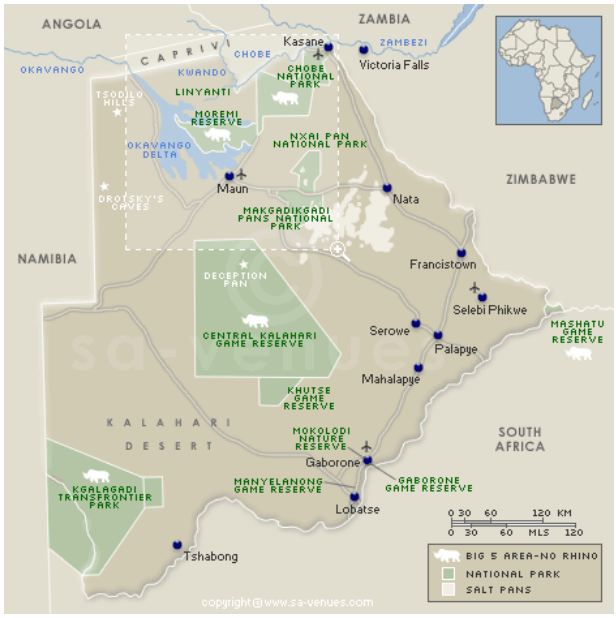
[34] For more information on CBNRM see "Rural Livelihoods, Poverty Reduction, and Food Security in Southern Africa: Is CBNRM the Answer?" (2007), or "Integrating CBNRM into UNCCD Strategies – Experiences in Select Southern African Countries" (2007).
[35] Source: SADC Biodiversity Strategy; with IUCN and SADC

Threats to natural resources and biodiversity, and hindrances to sustainable natural resource management, include:

- Population growth and human encroachment, which result in land conversion, over-exploitation of wild animals and fuel wood, and expanding agriculture and cattle grazing.
- Rangeland degradation, which leads to bush encroachment and loss of grazing habitat, and ultimately contributes to desertification.
- Deforestation as a result of uncontrolled use.
- Bush fires. Uncontrolled fires have accounted for the loss of up to 80 percent of woodlands, allowing encroachment of undesirable fire-resistant species of vegetation.
- Soil and wind erosion.
- Decreased surface fresh water.
- Increased water salinity.
- Disruption of wildlife migration corridors due to cattle fencing.
- Human/wildlife conflicts resulting from livestock predation and crop raiding by wild animals.
- Illegal hunting/gathering.
- Frequent and unpredictable drought.

In general, the government recognizes the severity of the threats and has attempted to mitigate them through a number of measures including provision of water (boreholes), construction of firebreaks, establishment of an anti-poaching unit, formation of a National Conservation Strategy, natural resource management planning efforts, adoption of resource conservation legislation, and conservation education throughout the school system. However, the issues are usually complex and involve

Protected Areas in Botswana



Source: www.sa-venues.com

economic and social tradeoffs. Major threats to biodiversity and natural resource conservation will be discussed later in this assessment.

Protected Areas

There are five categories of protected areas administered by the government: national parks, game reserves, forest reserves, wildlife management areas, and natural history monuments. In addition, there are private reserves and wildlife sanctuaries. The country has 71 protected areas, with 31 of these larger than 100,000 hectares, and 3 larger than 1 million hectares.

National parks have been set aside by the government to preserve the diverse fauna and flora and to allow for recreational and educational opportunities for local residents and visitors. Four national parks are administered by the government (DWNP), covering 45,900 km^2**.** Hunting or removing plants or animals in national parks is prohibited. Game reserves, totaling 60,550 km^2, are wildlife reserves where hunting is allowed on a restricted basis; a special permit is required.

In managing the country's parks and reserves, Botswana follows a policy of keeping visitor totals low and entry fees high.[36] This helps ensure that visitors are able to enjoy the solitude of the wilderness experience and is beneficial for wildlife. National parks and game reserves make up more than 17 percent of the land base. The objectives for these lands are:

- To preserve the diversity of organisms indigenous to Botswana's unique wilderness as functional elements of the ecosystem
- To maintain the ecological processes that characterize the savannah ecosystem
- To provide educational and interpretive programs for visitors to foster a better understanding and appreciation of ecology
- To realize economic returns from tourism while safeguarding the ecological integrity and pristine wilderness[37]

Following is a description of the major *national parks* and *game reserves*:

Chobe National Park. This national park (10,500 km^2) has one of the greatest concentrations of game in Africa, including giraffe, elephant, zebra, impala, wildebeest, kudu, buffalo, lion, hyena, jackal, cheetah, and sable and roan antelopes. The elephant population is estimated at 120,000 (2007), the highest concentration of elephants in Africa. The park represents four distinct ecosystems: marsh/swamps, desert, lush plains, and dense forest.

[36] Source: http://getawayafrica.com
[37] UNEP-Biodiversity Planning Support Programme; Botswana Case Study, 2001

Makgadikgadi and Nxai Pans National Parks. This national park complex (7,400 km^2) consists of a large expanse of grass plains, huge baobab trees, and saltpans (remnant lakes), which fill up with water during the rainy season. This area is known for wildebeest and zebra migrations and an abundance of other large mammals.

Kgalagadi Trans-frontier Park. This national park, established in 2000, was the first formally declared trans-frontier park (also known as a Peace Park) in Africa. The Kgalagadi Park (28,000 km^2) is on the southwestern border of Botswana and the Northern Cape border of South Africa. Within its boundary is the former Gemsbok National Park of Botswana. The park is located on the Kalahari Desert, which is part of the largest continuous area of sand in the world.

Moremi Game Reserve. Moremi, located along the edge of the Okavango Delta, includes mopane woodland and acacia forests, floodplains, and lagoons. Birdlife is prolific, with a large diversity of mammals as well. Wild dog, whose numbers are declining elsewhere, are regularly seen here, and research on this endangered species is ongoing.

Central Kalahari Game Reserve. This reserve is in the center of Botswana, and is characterized by vast, open plains, saltpans, ancient riverbeds, sand dunes, and flat bushveld. With a size of 52,800 km^2, this is among the largest protected areas in the world.

Khutse Game Reserve. The Khutse Game Reserve is an area of fragile vegetation and almost no surface water — an undulating plain of dry Kalahari bush savannah. There is an extensive mineralized pan system that provides important grassland habitat for herbivores, which attract predators such as lions, cheetahs, and leopards.

Gaborone Game Reserve. Although small, at just under 600 hectares, the Gaborone Game Reserve is the third busiest reserve in Botswana. Animals in the reserve include impala, kudu, ostriches, wildebeest, zebra, gemsbok, bushbuck, springbok, duiker, and Africa's largest antelope — the eland.

Linyanti Game Reserve. This reserve is a riparian area along the southern banks of the Linyanti River, with large concentrations of wildlife, including the rare wild dog.

Mashatu Game Reserve. Mashatu is the largest private reserve in southern Africa. It is located north of the Limpopo River in eastern Botswana and covers 46,000 hectares of savannah plains, riverine forests, open marshland, and rugged outcrops of sandstone. The area is known for its natural beauty, unique vegetation, rock formations, and abundant bird species.

Manyelanong Game Reserve. The tiny Manyelanong Game Reserve protects a breeding colony of Cape vultures. It is known for its hills, sheer cliffs, and baobab trees.

Forest reserves cover 455,000 hectares, or about 0.8 percent of the country. They have been established for the conservation and sustainable use of forest resources.

Wildlife management areas (WMAs) are natural areas established for multipurpose uses, predominately wildlife use. In most cases, wildlife management areas buffer parks and game reserves. Livestock boreholes are not allocated inside WMAs, and only small numbers of livestock owned by residents can be kept inside. The DWNP has started to allocate hunting quotas for some WMAs; communities have the option to sublet these rights or to use the rights themselves. About 20 percent of the land base has been designated as wildlife management areas, which means that more than 37 percent of the land has been set aside as some form of protected area.

Natural history monuments in Botswana are protected areas that contain one or more natural or natural/cultural features that are outstanding or unique because of their inherent rarity or cultural significance. There are 5,900 hectares of natural history monument-protected areas in Botswana, including ancient rock paintings, caves, fossils, botanical sites, and memorials.

The World Conservation Union defines protected areas as "an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means." No areas in Botswana fall under Category I, which are strict nature reserves used mainly for scientific research.[38] National parks in Botswana are IUCN Category II protected areas, managed primarily for ecosystem protection and recreation. Natural history monuments fall under IUCN Category III, a protected area managed for conservation of a specific natural or cultural feature. The game reserves are categorized as IUCN Category IV protected areas, managed mainly for conservation through management intervention. The wildlife management areas in Botswana are IUCN Category VI lands, managed mainly for the sustainable flow of natural products and services to meet community needs.

Threats to Protected Areas

As described above, the objective for protected areas in Botswana is to maintain natural ecological processes and preserve the biodiversity of organisms within these areas. However, despite these objectives, protected areas are vulnerable. Although most eco-regions in Botswana are represented in the protected areas, none of the protected areas is considered a complete ecological unit by itself. Consequently, fragmentation and trans-boundary issues threaten the protected areas. There are also problems with water for the parks and reserves. Moremi Game Reserve, in the Okavango Delta, is the only protected area with sufficient surface water. For example, Chobe National Park has only 70 km of permanent water in the form of the Chobe River. Other than that, no surface water exists in Chobe National Park. Machines pump water to the surface from deep underground aquifers. At times, this has resulted in the lowering of the water table.

[38] For further information on IUCN's categories, reference http://www.unepwcmc.org/protected_areas/categories/index.html

Observations show that some perennial surface springs and water holes are dry.[39] The government has recognized the need for comprehensive monitoring of the water resource in the country's parks and reserves.

Other threats faced by protected areas in Botswana include:

- Restriction of wildlife migration routes due to livestock disease-control cordon fences adjacent to protected areas
- Illegal exploitation of resources within protected areas (hunting/gathering)
- Extended drought
- Bush fires

Status and Protection of Endangered Species

The IUCNs Red List includes one species in Botswana as critically endangered, one as endangered, and 16 as vulnerable. The full list is shown below, and original information is provided at the IUCN Red List Web site: http://www.iucnredlist.org/.

Common Name	**Scientific Name**	**Red List Category**
Black Rhinoceros	*Diceros bicornis*	Critically Endangered
African Wild Dog	*Lycaon pictus*	Endangered
African Elephant	*Loxodonta Africana*	Vulnerable
African Lion	*Panthera leo*	Vulnerable
Cheetah	*Acinonyx jubatus*	Vulnerable
Black-Footed Cat	*Felis nigripes*	Vulnerable
Common Hippopotamus	*Hippopotamus amphibius*	Vulnerable
Percival's Trident Bat	*Cloeotis percivali*	Vulnerable
Wattled Crane	*Grus carunculatus*	Vulnerable
Lesser Kestrel	*Falco naumanni*	Vulnerable
Cape Griffon/Vulture	*Gyps coprotheres*	Vulnerable
Slaty Egret	*Egretta vinaceigula*	Vulnerable
Black-Cheeked Lovebird	*Agapornis nigrigenis*	Vulnerable
Threespot Tilapia	*Oreochromis andersonii*	Vulnerable
Greenhead Tilapia	*Oreochromis macrochir*	Vulnerable
Lappet-Faced Vulture	*Torgos tracheliotos*	Vulnerable
White-Headed Vulture	*Trigonoceps occipitalis*	Vulnerable
Black Harrier	*Circus maurus*	Vulnerable

[39] UNEP-Biodiversity Planning Support Programme; Botswana Case Study, 2001

Critically endangered, endangered, and vulnerable animal and plant species are at risk from many of the same pressures as the protected areas: bush fires, population pressure, animal husbandry practices, droughts, and loss of habitat.

Status and Protection of Forest Reserves

Although the Kalahari sands cover 80 percent of Botswana and only an estimated 6 percent of the total land area is considered suitable for agriculture, shrub-like vegetation, sparse savannah, open woodlands, and dry deciduous forests still occur in 60 percent of the country. These woodlands/forests are mostly on tribal lands, which are owned by tribes throughout the country and are mainly in the north and northeast. Forest reserves, administered by the government, make up a mere 0.8 percent of the total land area. Forestry is a subsector under the Ministry of Agriculture. The initial function of this subsector was to establish plantations, control grazing, and collect taxes, rents, fees, and royalties. These functions have since expanded to include forest protection, conservation, and management in accordance with recent national forest policy and legislation. Today the main broad functions of the forestry subsector are:[40]

- Declaration of lands as forest reserves and the reciprocal power to make grants or dispositions of such lands for purposes other than forestry (e.g. extensions of towns and villages)

- Regulation of the protection and flow of goods and services from the forest to society

- A conservation role expressed through the sustained yield concept in forest management, based on the philosophy of safeguarding the public interest

Forests and woodlands are important to the people of Botswana because they provide firewood and materials for fencing, construction, and crafts.[41] However, overuse in areas surrounding villages and towns, persistent drought, overgrazing, wildfires, and the deep-rooted cultural belief of “free for all” on tribal lands have caused drastic declines in forested areas and conversion of large areas from productive woodlands to less productive grassland and shrub formations. This land conversion has led to soil erosion, flash flooding, and localized fuel wood and construction wood shortages.[42] Although several research and monitoring studies have been conducted, few recommendations have been fully implemented, due to resource and institutional constraints.

Traditionally, Botswana’s society is agrarian, and forestry is secondary, despite numerous goods and services derived from woodlands. The depletion of forest resources is likely to become more widespread and serious, in view of the anticipated population growth, socioeconomic changes, agricultural production, energy needs and consumption patterns, and institutional frameworks (policies, land tenure systems).

[40] Forestry Outlook Study for Africa — Botswana
[41] Forestry Outlook Study for Africa — Botswana
[42] For more information reference Ministry of Agriculture Report http://www.gov.bw/government

Conservation Outside of Protected Areas

Botswana has a small population and low population density. Consequently, wilderness and wildlife resources are relatively abundant, even outside of protected areas. Conservation outside of protected areas, however, is limited, which creates significant challenges for viable conservation of natural resources and biodiversity in Botswana.

Most of the land outside of protected areas is tribal or communal land. Management of communal land and its resources is minimal. Open access is common, particularly close to villages, and although the Agricultural Resources Board issues harvesting and trade permits for veld products, most use is uncontrolled.[43] Water use rights for boreholes and extraction from rivers must be granted, but there is virtually no monitoring. Hunting, harvesting, transfer, and trans-boundary movement of biological resources takes place with an absence of, or inadequate level of, legislative and regulatory mechanisms in place.[44] Where regulations exist, enforcement is necessary (e.g. hunting).

Perhaps the greatest threat in unprotected areas, particularly for wildlife, is habitat loss. Many factors influence habitat loss, notably the continuing pressure of cattle ranching, which often leads to range degradation. Other factors include bush fires and desertification due to human activity. Most natural resource threats outside of protected areas are preventable. Conservation and good management practices outside of protected areas would be beneficial. Threats and possible actions to relieve the threats are discussed in more detail in the following sections.

[43] Case Studies on Successful Southern African NRM Initiatives and Their Impacts on Poverty and Governance, Botswana, 2006
[44] UNEP-Biodiversity Planning Support Programme; Botswana Case Study, 2001

MAJOR THREATS TO BIODIVERSITY AND FOREST CONSERVATION

Biodiversity in Botswana faces several major threats, which continue to intensify. These threats fit into four broad categories: drought and desertification, land degradation, population pressure, and pressure on water resources.

Drought and Desertification

Drought is defined as an extended period of months or years when an area experiences a deficiency in water supply. Africa has historically been hit hard by droughts, leading to devastating effects on agricultural lands and biodiversity, and ultimately to poverty and civil strife in many countries.

The 1992 U.N. Conference on Environment and Development in Rio de Janeiro defined desertification as "land degradation in arid, semi-arid, and dry sub-humid areas resulting from various factors, including climatic variations and human activity." The transformation in habitat caused by desertification is significant to the biodiversity of plants and animals that use the affected habitats. This has led to the decline, and even extinction, of species previously adapted to the climate. In addition, the decline in arable land causes losses in agricultural productivity, leading to poverty and an increase in pressure on already vulnerable lands. Desertification leads to soil erosion, reduced soil moisture retention, increased runoff, and reduction in land productivity.

In Botswana, as in most of southern African, drought and desertification is a major macro-level threat. Botswana has a stable government and economy, with a relatively well-developed infrastructure, and maintains good relations with other southern African nations. This has resulted in a more rapid and prolific response to drought than in other African nations. However, when taking into account the possible long-term impact of persistent drought and desertification, it becomes clear that the problem almost defies management; adaptability is necessary. The threats of land degradation, population pressure, and water resource damage make Botswana less adaptable to the possible long-term impact of climate change.

Land Degradation

Botswana is a semi-arid country with a fragile ecosystem susceptible to land degradation, which may lead to desertification. Land degradation is defined as "a reduction or loss of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities."[45] Land degradation in Botswana is predominately caused by human factors. Probably the greatest contributors to land degradation are unsustainable livestock grazing, unsustainable agriculture, and over-exploitation of forest products.

[45] UNCCD, 1995.

Land degradation leads to a decline in productive land base and in the biodiversity of native plant species. This ultimately affects the survival of wildlife and the rural communities that depend on sustainable wild herds, native food sources, and wood products. In the end, preventable land degradation only makes Botswana more vulnerable to drought and climate change, as it loses the capacity to adapt.

Livestock Grazing Pressure. As the provision of water for people and livestock from drilled boreholes has become more common, the size and location of villages and grazing areas is no longer limited by the amount of surface water during the dry season. The traditional system of moving people and cattle from temporary cattle posts to other locations has gradually been abandoned in favor of a sedentary system with permanent grazing around stable water sources. Due to the high cost of developing water sources, a large number of livestock are usually concentrated around the few available water sources, causing extensive overgrazing within the vicinity of the water source. Livestock numbers have increased rapidly, as has grazing pressure on rangelands. Experience has shown that bush encroachment is likely to occur within several years of the introduction of boreholes, and there is clear evidence of vegetation changes around water points and settlements.[46] With the development of boreholes, cattle ranching has pushed further into more fragile rangelands and land degradation has occurred as a result, bringing with it soil and wind erosion, sand dune encroachment, and vegetative change in the form of bush encroachment and the introduction of invasive species.

Land degradation associated with livestock grazing pressure exacerbates the conditions caused by climate change. Initially, the two main factors that determine natural woody vegetation (bush/brush) distribution are rainfall and soil type. Human disturbance cuts across the natural factors, resulting in very different vegetation types under otherwise similar natural conditions, accounting for bush encroachment on the communal rangelands in Botswana.[47] Bush encroachment is widespread, but is particularly pervasive in the southeast, in scattered areas close to settlements in the Kalahari, and in the vicinity of the Makgadikgadi pans.[48]

The increasing competition with livestock for grazing has led to a decline in wildlife resources. Livestock pressure has also led to the practice of erecting cordon fences to discourage the association of livestock and wild animals. This has impeded the free migration of wildlife, and in some cases, cut off access to important surface water sources. These fences are erected in an effort to prevent the spread of diseases, such as foot-and-mouth, between wildlife and cattle, thus making the cattle more saleable in international markets. As an example, the government of Botswana is building a cattle fence 200 km long that will bisect a wildlife habitat near the Okavango Delta. A similar fence, built previously, was removed after an environmental impact assessment described many negative effects. In the past, the fences have not been effective in containing disease outbreak and they have negative effects on the natural dispersal pattern of wildlife.

[46] Source: http://www.bangor.ac.uk/rangeland
[47] N.M. Moleele et. al. 2001.
[48] N.M. Moleele et. al. 2001.

Mitigating the effects of livestock grazing pressure may be difficult. The livestock sector has been a main beneficiary of government support through subsidies and tax advantages.[49] It has been reported that the government subsidizes more than 50 percent of livestock producers' costs.[50] Subsidies have covered borehole drilling and maintenance and various inputs. In many cases, government support of the grazing industry has been an attempt to alleviate rural poverty. Cattle have a high sociological value in Botswana; their worth cannot be expressed in monetary terms alone. Instead of seeing cattle as only a commercial asset, cattle are perceived as a prestigious and political asset as well.

Unsustainable Agriculture. Only about 6 percent of the country is arable. The expansion of agricultural activities into areas where agriculture is not sustainable has put considerable stress on rangeland and forest resources.[51] The situation is similar to the increased pressure from livestock grazing. Groups of people who were more mobile, moving according to seasonal availability of surface water, are now sedentary. There is more pressure on natural resources of an area as its use increases and becomes yearlong. Communal land use makes the problem more difficult as each person seeks to gain the maximum benefits from the same piece of ground. In many areas, sustainable management is not being practiced, leading to loss of topsoil through soil and wind erosion, loss of native plant populations (including important veld products), and the introduction of invasive species.

Deforestation. In addition to land degradation from livestock grazing pressure and unsustainable agriculture, land degradation in the form of deforestation is occurring. As described previously, forests and woodlands represent an important resource in terms of providing an energy source and materials for building, fencing, construction, and crafts. However, a deficit of forest products occurs in many areas surrounding population centers. This situation is not helped by recurring drought, bush fires, overgrazing, and the deep-rooted cultural belief in tribal (communal) lands that are contrary to conservation.

The net energy supply in Botswana, like many developing countries, shows that fuel wood accounts for 69 percent of the source.[52] Consequently, the availability of fuel wood has reached a critical level in many settlements and over-use has led to deforestation. The depletion of forest resources outside of forest reserves — on tribal lands — has been serious. Open-access communal ownership is inevitably resulting in each individual trying to extract the maximum benefit from the resource, leading to over-exploitation.

Population Pressure

The population in Botswana stands at more than 1.8 million, with a growth rate of 1.5 percent in 2007. The average density is low; however, as the population increases there will be increased land conversion of wild lands to meet people's needs, and increased pressure on natural resources, especially if some traditional practices are not changed.

[49] Source: http://www.bangor.ac.uk/rangeland
[50] Fidzani et al., 1996
[51] Forestry Outlook Study for Africa - Botswana
[52] Botswana National Report on the Implementation of UNCCD, 2002

Population and economic growth have increased the demand for food, wood, and space for human settlements, thus putting pressure on natural resources.

Socioeconomic factors driving negative effects on natural resources in Botswana include the change in settlement patterns discussed preciously — unbalanced and increased pressure on resources as the human population has become more sedentary and less transitory due to new technology (e.g. borehole development).

Where people and wildlife mix, there is a high potential for conflict. Rural subsistence farmers lose crops, and damage to infrastructure such as boreholes, water pipes, fences, and houses is common. As a result, human attitudes are becoming increasingly negative toward wildlife in parts of the country. This is especially true of the interaction between elephants and people.

The HIV/AIDS infection rate in Botswana is among the highest in the world. The pandemic presents a severe challenge to the country, threatening to undo many of its social and economic gains. With a 24 percent prevalence rate among adults 15-49 years of age and 33 percent among pregnant women, Botswana's productive age classes could be severely affected. There is the potential for a significant loss of staffing, workforce, and knowledge. In addition, the cost of providing health care and supporting single-income families and orphans could be a major setback for the economy. If economic conditions worsen, the enthusiasm for biodiversity and natural resource conservation will dwindle. Natural resource conservation is generally not a priority for people living in poverty. Farmers are forced to overgraze on what little land they lease or on already degraded communal grazing lands and over-use and poaching of wildlife occurs.

Pressure on Water Resources

Borehole Technology Provides Potable Water

Source: USAID

Botswana's harsh climatic conditions, coupled with increasing demands for consumptive water uses from all sectors of the economy, makes water a valuable commodity. Continued droughts threaten groundwater and river basin water levels, which in turn affect the availability of water for wildlife, human consumption, agriculture, tourism, and industry. Permanent surface water in Botswana can only be found in the Okavango Delta and Chobe River systems.[53] In the north and east, surface water is widespread during the rainy season, mostly in dams and shallow wells. In the west, which is generally dry except for ephemeral pools in pans and fossil rivers, water is obtained from hand-dug wells or deep boreholes. Botswana has experienced 12 drought years in the past 22, on a regular, cyclical basis. Water management is critical, as groundwater and river

[53] Botswana NAP to Combat Desertification, 2006.

basin watersheds are threatened. Even without climate change, Botswana and other southern African countries face a growing water crisis. Six countries were water-stressed or faced chronic scarcity in 2005 and the situation is expected to worsen significantly by 2025.[54] Water resources are equally important for people, wildlife, and the ecosystem as a whole.

Settlements have a close relationship with water sources. In areas with river systems, settlements are near rivers or dams. Studies have shown that groundwater pollution is increasing near many settlements, because most households in rural areas use pit toilets.[55] Overuse of surface water sources has led to increased salinity and a decrease in available fresh surface water. In addition, in drought years, wildlife is more vulnerable to hunting as animals are forced to congregate at permanent water sources. Even in the national parks, tourist facilities are located near waterways. There is a great potential for water pollution (sewage problems and industrial pollution) and hindrance to free movement of wildlife around important water sources.

Proposed Actions and Recommendations for USAID Programming

The scope of this assessment has been limited to U.S.-based research and document review, using such publicly available information as the 2008 Congressional Budget Justification for Foreign Operations and other information about USAID-supported activities in Botswana in recent years. However, this analysis can allow for some general recommendations for USAID to contribute to biodiversity and forestry conservation that are consistent with U.S. goals and objectives. Recommendations are general in nature and would be contingent on specifics of the programming.

Given the importance of trans-boundary protected areas, the prevalence of HIV/AIDS, and the need for promoting economic diversification and sustaining economic development and natural resource management, there is great potential for USAID to have an impact on biodiversity conservation in Botswana. Although USAID does not have an office in Botswana, the regional office in Pretoria, with the help of the U.S. Embassy in Botswana, should continue to focus on how USAID can support conservation efforts. Specific recommendations for proposed program elements are discussed below.

Peace and Security/Consolidating Democracy

For FY 2008, $690,000 has been requested for assistance in training Botswana's military leaders through the International Military Education and Training program. An agreement has been signed that allows the United States to help the International Military Education and Training programs, which emphasize leadership, management, civil/military relations, and human rights.

Although peace and security activities are not directly tied to conservation efforts, they have important connections, with the potential to affect environmental activities. For

[54] Source: http://www.thewaterpage.com/demand_handbook.htm
[55] Source: http://countryprofiles.unep.org/profiles/BW

example, along the northeastern border of Botswana, there is a concern over thousands of Zimbabwean refugees who flee to find work or escape political persecution. This area is important to biodiversity in the country, and refugees crossing the border quickly become an environmental issue as unemployment in rural areas grows and there is more pressure on natural resources. The need for regional peace and security is also apparent when considering that protected areas require law enforcement internally from poor farmers and herders, as well as along borders, in trans-boundary protected areas.

Therefore, USAID should work with organizations implementing the peace and security activities and with conservation organizations. Together, these organizations can identify and target areas that have the most need for security and natural resource protection.

Investing in People — HIV/AIDS

The FY 2008 foreign aid budget calls for $79 million to increase the capacity of organizations focusing on HIV/AIDS. The President's Emergency Plan for AIDS Relief funding contributions also includes an additional $9,276,000 for HIV/AIDS support through Health and Human Services and the Peace Corps. In Botswana, people are suffering from the HIV/AIDS crisis, which is having a direct effect on conservation efforts. Conservation organizations are losing highly trained staff to HIV/AIDS, as well as experiencing a loss in productivity due to staff taking time off to attend to family members who are ill or to attend numerous funerals. Many AIDS-affected households are turning to natural resources for alternative income. Due to the loss of family members and a decline in household income, unsustainable agriculture and grazing, and over-harvesting of veld products is on the rise. There is an increase in the demand for medicinal plants to treat the side effects of AIDS; timber harvesting for coffins is on the rise as well.

USAID can have a positive effect on environmental conservation efforts through HIV/AIDS work in a number of ways: support medical training in Botswana, promote HIV/AIDS education throughout environmental conservation organizations to reduce infected employees, work with health organizations to improve natural resource management, educate families about appropriate technologies that will increase food production while caring for the soil, and promote alternatives to over-harvesting of medicinal plants and timber.

Integrated River Basin Management Project (IRBM): Towards a Consensus on Trans-boundary Management of the Okavango River Delta

USAID has been working to support the SADC and multi-national river basin organizations (such as OKACOM) to help promote the long-term sustainable management of the Okavango River Basin. In concert with other U.S. partners and local partners, USAID has worked to promote joint fact-finding and the development of a decision-making model for the basin and has helped to broaden stakeholder participation in the planning process. This project has been important for biodiversity in Botswana and in southern Africa; the Okavango/Kubango River Basin represents one of the most ecologically distinctive river systems in the world. International cooperation in

the Okavango Basin was recognized by the world scientific community in the recent Draft Working Group Report for the International Panel on Climate Change (April 2007).

There are still biodiversity issues surrounding the Okavango Delta ecosystem that need to be resolved. The panhandle is a fragile area and if it is degraded, the delta could die off. There is also the potential for regional conflicts that may need to be resolved; potential water withdrawals by Namibia, fencing by Botswana and Namibia, or upstream water development in Angola. Trans-boundary conservation and management is essential to maintain the integrity of the Okavango River Basin. It is recommended that USAID continue to support programs like the Integrated River Basin Management Project, which work at resolving conservation concerns in the Okavango Delta on a regional landscape.

Community-Based Natural Resource Management

For more than a decade, USAID has supported Botswana in development of CBNRM. CBNRM is a crucial part of natural resource conservation in Botswana because it promotes economic diversification (e.g. eco-tourism) and, as demands on scare resources become greater, it enables conservation to pay for itself by giving people an incentive to look after their natural resources. CBNRM may also be a critical factor in helping Botswana alleviate poverty and reduce income inequity.

There is still a place for USAID support in implementation of CBNRM. The communities are unable to stand on their own when it comes to community-based enterprise. The government of Botswana, in an effort to curb what it sees as unethical use of generated funds, has recently decided to deposit 65 percent of earned revenue and designate administrators to manage the funds.[56] Under this new policy, only 35 percent of profits would remain in the local community. This approach could effectively derail CBNRM programs; if the money does not remain in the communities, then natural resources like wildlife will be seen as a nuisance or something to exploit, rather than a development resource. There is a need for enterprise development training, development of administrator skills in financing, and support of local community enterprise programs as they get started. This could be done through existing NGOs and the government of Botswana, or even on a regional basis, because the issue of CBNRM is a regional one. There is room for aid in strengthening proven enterprises (e.g. tourism), as well as development of less familiar enterprises like wood-crafting, weaving, or commercial gardening.

In the end, CBNRM is probably the best path to rural economic survival. It is not only the best economic use of the land; it is also the best way to be adaptive, especially with climate change issues on the horizon.

[56] Personal Communication – S.Johnson, project manager, Wildlife Conservation and Management Programme, January, 2008

CONCLUSION

The need to increase natural resource management and conservation in Botswana is important. Botswana possesses several unique ecosystems that are globally important: the Okavango Delta, a Ramsar site and the largest inland delta in the world; the Makgadikgadi and Nxai pans, which provide an important wildlife habitat; the Chobe River Basin, which supports large populations of elephants and other large mammals; and the Kalahari Desert. Unfortunately, these unique ecosystems and other protected areas are threatened by land degradation, which is leading to desertification, increased population pressure, and water pollution.

Although USAID does not have staff in Botswana, the regional office has been active in several environmental projects there, and is supporting efforts to improve the HIV/AIDS crisis.

A review of proposed FY 2008 U.S. government assistance to Botswana does not present major threats in terms of the potential impact on the country's biodiversity and forest resources. In fact, the opportunity to incorporate conservation objectives into planned activities is an important one that should not be missed. To ensure that these objectives are streamlined, USAID should make sure the environmental impact assessments are conducted routinely and taken into consideration when planning activities.

The following general recommendations are offered as specific USAID programming is considered and planned:

- Ensure that agricultural projects (including livestock production) encourage sustainable management practices. Projects that include livestock fencing should not be encouraged and are probably not appropriate for funding, due to the detrimental effects on biodiversity.

- When working with rural communities, focus on those living near or in biologically diverse areas/protected areas. Promote and encourage better natural resource management practices and promote community-based natural resource management, with an emphasis on enterprise development training and local enterprise development programs.

- Look for projects that have the potential for crosscutting programming, such as incorporating environmental awareness into health, education, and law enforcement activities. Work with other development organizations that are concentrating on issues other than the environment.

- Actively monitor the possible negative environmental impact of programming, and employ Regulation 216 in conducting environmental impact assessments for projects.

- The environmental issues that face Botswana are common throughout southern Africa, and, in many cases, require treatment within that context. Look for opportunities to support regional initiatives that will benefit Botswana environmentally.

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