

approach, in the absence of a National Policy on Intellectual Property Rights and Bio-prospecting. There is a need to develop policies to guide bio-prospecting activities which are consistent with the provisions of the CBD as it relates to access to genetic resources.

### 5.10. Population and Biodiversity

Belize population is relatively small compared to other countries of similar size. Nevertheless, the population growth rate has been increasing, while the territorial area has remained constant at 8,867 square miles. The average annual growth rate was 1.9% between 1970 and 1980 and increased to 2.6% between 1980 and 1991. Approximately twenty six thousand persons were added to the population between 1970 and 1980 and 44,000 between 1980 and 1991. This has resulted in a population density of 16.4 and 21.4 in 1980 and 1991, respectively (Draft Population Policy Document, Population Unit, Ministry of Human Development, Women and Youth, Belmopan, 1998).

**Table : Population Distribution for 1970, 1980 &1991 Censuses**

<b>Division</b>	<b>1970</b>	<b>1980</b>	<b>1991</b>
Country Total	119,934	145,353	189,392
Urban	65,025	76,277	90,005
Rural	54,909	69,076	99,387
<b>Districts</b>			
Belize	49,355	50,801	57,030
Corozal	15,551	22,902	28,464
Orange Walk	17,041	22,870	30,681
Cayo	15,975	22,837	37,692
Stann Creek	13,023	14,181	18,085
Toledo	8,989	11,762	17,439

**Source: 1997 Abstract of Statistics, Central Statistics Office.**

**Ministry of Finance, Belmopan.**

During the 1980's, the rural areas experienced higher growth rate than the urban areas which resulted in a higher rural than urban population in 1991. This rural shift in the population occurred at a time when most countries of the region experienced urbanization of the population. One of the factors which contributed to this shift is international migration. Almost 66% of the foreign born persons who came to Belize during the 1980's settled in the rural areas and added to that population, while the majority of the emigrants (74.9%) left from the urban areas of Belize (Draft Population Policy Document, Population Unit, Ministry of Human Development, Women and Youth, Belmopan, 1998).

Mid-year population estimates for 1997 indicate that the population was 230,000 and that the urban/rural population is almost balanced. The urban population accounted for 50.4% of the total population, a significant increase compared to 1991 when only 47.5% of the population lived in the urban areas (Draft Population Policy Document, Population Unit, Ministry of Human Development, Women and Youth, Belmopan, 1998).

The relatively high growth rate and spatial distribution of the population are contribution factors to the loss of bio-diversity in Belize. The establishment of settlements in the rural areas on land that is more suitable for agriculture and the practices of slash and burn have contributed to the loss of bio-diversity. In the urban areas, the city and all the towns are situated along the coast or major rivers. Movements to these coastal areas, especially in Belize City where mangroves are cleared for housing and industrial development, have also contributed to the loss of biodiversity.

These demographic factors, combined with issues of poverty should be taken into consideration in addressing the preservation of Belize's biodiversity. Data on poverty based on the 1995 Poverty Study indicate that 33% of the population lived below the poverty line and that 13.4% were extremely poor. The incidence of poverty was higher in the rural areas (42.5%) than in the urban areas (20.6%). It was also noted the poor dominated the agriculture and fishing sectors, especially in Stann Creek and Toledo districts. These poor and even the non-poor use technologies which have not been conducive to sustainable development and which could become a threat to Belize's biodiversity (Draft Population Policy Document, Population Unit, Ministry of Human Development, Women and Youth, Belmopan, 1998).

The Government of Belize has already taken initiatives in addressing the issues of population and development. A Population Unit was established in the Ministry of Human Resources in 1996, with the mandate to coordinate the formulation of a National Population and Development Policy and the integration of population variables in development policies, plans and programmes. The Population Unit has prepared background studies on international migration and its impact, population projections (1990-2015) and review of literature on reproductive health and family life and the spatial distribution of the population. A draft Population Policy Document is presently under review. The implementation of the Population Policy will be conducted in collaboration with other relevant GOB Ministries, Departments and NGOs (Draft Population Policy Document, Population Unit, Ministry of Human Development, Women and Youth, Belmopan, 1998).

#### **5.11. Biosafety**

The extent of Belize's position on biosafety goes no further than the Plant Protection Regulations and the Animal Disease and Import Regulations, which have been consolidated under the present Draft National Agricultural Health Services Bill of 1997. The objectives of this draft Bill include the following areas relevant to biodiversity:

- to establish central and regional laboratories for services to plant and animal health and other related services;
- to strengthen the information system to support an effective agriculture health service;
- to regulate and control the importation of plants and animals in to Belize;
- to assist in the regulation and control of the importation of plant and animal products in to Belize;
- to monitor, regulate and control the quality and sustainability of veterinary drugs, biologicals and agro-chemicals;
- to maintain liaison with foreign, regional and international bodies dealing with agricultural health and trade in agricultural products;
- to develop and promote Private Sector participation in the execution, control and eradication of pests and disease affecting the agricultural sector; and
- to issue import licenses, permits and certificates of inspection under this Bill.

These regulations limit the country's legal powers only to addressing symptoms of existing known diseases and pests. Living Modified Organisms (LMOs) do not have these visible symptoms which Quarantine Officers would normally look for. The threat from LMOs are the genes which, if introduced into the local and national gene pool, could be devastating to Belize's biodiversity. The Animal Disease and Import Regulations reflect the same situation above and may be weaker to address biosafety issues, since they deal with vaccines (Alvarez in lit., 1998).

In the absence of national guidelines or policies dealing with the handling, regulating and releasing of LMOs, it might be easier to amend existing regulations to address biosafety, as stipulated by the International

Biosafety Protocol currently under negotiation by parties to the CBD. This protocol being negotiated, which Belize is a part to, is a binding agreement at the national level. Therefore, it is absolutely necessary for Belize to establish a competent legal authority to address biosafety issues such as trans-boundary movements of genetically engineered organisms, which may have adverse effects on Belize's biodiversity (Alvarez in lit., 1998).

## 6.0. STRATEGIC RECOMMENDATIONS AND ACTIONS

### Overall Strategy

Biodiversity in Belize is under continuous exploitation pressure. The rate of habitat destruction, coupled to the arbitrary exploitation of biological resources renders monospecific management approaches inadequate. Ecosystems management must be promoted as a measure to conserve not only species, but also critical habitats and their inter- and intra-specific relationships. Efforts will be made to identify new areas that merit protective status, with the objective of ensuring their protection *in-situ*. Immediate actions will include the formal adoption of the Protected Areas Systems Plan and the development of a Management Framework for Protected Areas including Marine Reserves.

As a complementary activity, private and national Botanic Gardens and herbariums will be promoted and maintained, as well as the storage of seeds in seedbanks. Where financial and human resources permit, research on the captive breeding of native species will also be promoted in an effort to replenish depleted stocks in order to encourage the cultivation of local species, thus minimizing the introduction of exotic species.

Existing laws and policies governing Belize's biodiversity are obsolete and do not reflect the regulatory needs of the resources, especially the Fisheries Act and the Wildlife Protection Act. This problem is compounded by legislative overlaps and lack of enforcement mechanisms, resulting in the existing legal framework being highly ineffective. Early revisions of present laws as well as the formulation of new laws to specifically address biodiversity must be given priority. In both cases, the inclusion of enforcement mechanisms is indispensable. The reassignment of mandates to agencies with governance over the management of biological resources should be initiated immediately to eliminate legislative overlaps. The development and adoption of several policies will be essential for obtaining the sustainable use of biological resources in Belize: an Integrated Coastal Development Policy; a Fisheries Development Policy; a Tourism Development Policy; a National Agriculture Policy; a Forest Policy; a National Land-Use Policy and a National Population Policy. The Integrated Coastal Development Policy will be required to contain a strong component on conflict resolution, the Agriculture Policy will be required to contain special emphasis on controlling the introduction of LMOs, while the National Population Policy will be required to specifically address unplanned settlements by immigrants.

The major threats to biodiversity in Belize are either directly or indirectly related to agriculture and tourism. There are several concurrent approaches that will be undertaken to reduce the conflicts between agriculture and biodiversity. Such approaches will ultimately be beneficial to the Agriculture Sector in providing for its long term sustainability. These include: minimizing physical acreage under agriculture by increasing levels of productivity and efficiency; minimizing the impact of chemicals used by closely monitoring application levels; introducing biological control methods for pests and diseases; expanding agro-forestry and leguminous cover crops as fodder crops and for soil rehabilitation; providing habitats for wildlife within farms; providing alternative sources of income, from the Forest Sector in particular in rural areas, thus reducing the necessity of planting cash crops in the milpa system; introducing incentives for ecologically sound investments; and the expansion of reforestation programmes.

Likewise, concurrent approaches that will be undertaken to reduce conflicts between tourism and biodiversity conservation include: the provision of adequate infrastructure; increase access to new areas of eco-tourism interest; the introduction of an acceptable impact approach to determine capacity levels of tourist sites; adequate waste disposal; increase in tourist visitation charges to allow for the sustainable management of Protected Areas.

Institutions with responsibilities for the management and development of biological resources do not possess the infrastructure or human resources necessary to effectively perform their functions. Most of the available staff lack technical training. Primary users and other stakeholders of Belize's biodiversity are not sufficiently exposed to sustainable methods of exploitation and to the rationale for biodiversity conservation. Obtaining trained personnel and conscious stakeholders are an utmost priority in the Strategy. Institutions must be

equipped with at least the minimum infrastructure necessary to ensure efficiency.

Structured and focused management of biological resources have been minimal in Belize. Management measures are developed based on the availability of quality data. Though much research have been conducted on biological resources, these are not management-oriented research, thus the data produced have little or no immediate application to management. Focused research will be promoted as a permanent activity that will continuously provide the data necessary on which to structure management measures and develop policies.

Conventional and traditional management principles have always been guided by the need for enforcement through physical monitoring and surveillance. This responsive approach, however, ignores the root cause of the problem, is expensive and is usually ineffective. In addition, traditional management measures rarely ever include the inputs of the community, resulting in very poor implementation success. The community must play a more active role in the management of the resources on which they depend for their livelihood. Maximizing community participation reduces cost and provides a higher probability for implementation success and effectiveness. The Strategy promotes public awareness, education and community participation as key ingredients for effective monitoring and successful plan implementation.

Poor coordination, collaboration and 'turf protection' has been quite notorious between those agencies with mandates over the management of biological resources, resulting in duplication of effort, unjustified spending and reduced efficiency. A lack of knowledge on efforts by neighboring countries to manage trans-border resources and threats, can undermine local achievements and render them ineffective. In addition to national needs, efforts to conserve biodiversity must be seen from a regional perspective to ensure consistency with regional and global initiatives. This will facilitate the optimization of the region's human, financial and infrastructural resources.

Open access to genetic resources can easily result in arbitrary exploitation and indiscriminate use. Developmental research such as bioprospecting presents no guarantee for success and specific guidelines are essential for identifying accessible areas and for minimizing wanton waste. Belize has to develop its own capacity to conduct developmental research, therefore technology transfer and protection to intellectual property should be an integral part of access agreements.

The success of biodiversity conservation and development will depend on how well mechanisms can be put in place to ensure the equitable distribution of benefits. Whether benefits are direct or indirect, there has to be a conspicuous and tangible flow of returns for users, managers and the community at large. Global benefits derived from biodiversity conservation and development at the local, national and regional levels must also be built into the benefit-distribution equation.

#### **6.1. IN-SITU AND EX-SITU CONSERVATION (CBD: Article 8 and Article 9)**

Belize's biological resources are under continuous exploitation pressure through the clearing of natural vegetation for agriculture, tourism infrastructure, urban development and unsustainable harvesting techniques. The rate of habitat destruction, coupled to the arbitrary exploitation of biological resources renders monospecific management approaches inadequate. Ecosystems management must be promoted as a measure to conserve not only species, but also critical habitats and their inter- and intra-specific relationships.

Efforts will be made to identify new areas that merit protective status, both marine and terrestrial, with the objective of ensuring their protection *in-situ*. The Strategy seeks to formally adopt the National Protected Areas Systems Plan as an *in-situ* conservation measure, including the national Biological Corridors System.

As a complimentary activity, and where financial and human resources permit, research on the captive breeding of native aquatic species will also be promoted in an effort to replenish depleted stocks and to minimize the introduction of exotic species. *Ex-situ* conservation of plant species will be achieved through Botanic Gardens, Public Parks, School Gardens, a National Herbarium and the storage of seeds in

seedbanks.

A. Fisheries, Coastal and Marine Resources

6.1.1. Objective: to maintain and enhance coastal and marine biodiversity through the establishment of Protected Areas, captive breeding and research.

Actions:

- a. Conduct biological and socio-economic assessments of critical habitats in coastal and marine areas, inland water bodies and rivers, to determine their suitability for protective status.
- b. Building on the recommendations of the NPASP, develop an appropriate management framework for Marine Reserves and other Protected Areas, both legally and institutionally, to ensure the production of management plans for all existing and proposed Protected Areas, frequent reviews of management plans to identify new management needs, to evaluate the success of Protected Areas, to assess the concept of 'buffer zones' around Protected Areas, and for the modification of management plans as is necessary to address activities such as tourism.
- c. Identify and secure start-up funds for Marine Protected Areas and develop mechanisms for long-term financial sustainability.
- d. Promote the captive breeding of native species to assist in the replenishment of depleted stocks, as a source of protein for animal and human consumption, as a source of genetic material, and to minimize the introduction of exotic species; providing such operations do not negatively impact wild stocks.

B. Forest and Wildlife Management

6.1.2. Objective: to develop the National Botanical Garden and assist in the development of private Botanical Gardens, as an *ex-situ* conservation measure.

Actions:

- a. Finalize the acquisition of a 1,000-acre parcel in the vicinity of Belmopan for the further development of the National Botanic Garden.
- b. Set up a National Conservation Trust to oversee, among other things, the establishment and management of Botanic Gardens; and the development of collaborative efforts with Botanical Gardens, such as Missouri, Fairchild, etc.

6.1.3. Objective: to implement the National Protected Areas System Plan (NPASP) as an *in-situ* conservation measure.

Actions:

- a. Adopt a National Protected Areas System Plan (NPASP) as a management and policy tool for Protected Areas.
- b. Identify and access the funding necessary to implement the Minimum Conservation Areas recommended in the NPASP.
- c. Seek protection for all areas that merit protective status, including those identified and recommended in the NPASP.
- d. Review and upgrade the National Bird Sanctuaries System to include a workable management framework.

6.1.4. Objective: to complete the development of management plans for all Protected Areas, in accordance with the sustainable use of such areas.

Action:

- a. Identify and access the funds necessary to develop and update management plans for all Protected Areas.

6.1.5. Objective: to expand the existing collection at the National Herbarium and to initiate a National Faunal Collection including agriculture-related organisms.

Actions:

- a. Conduct plant collections in under-represented forest areas to increase the diversity and quality of plant specimens at the National Herbarium.
- b. Identify and access funding to initiate a National Faunal Collection including the expansion of existing collections and strengthening of relations with biosystematic services.

6.1.6. Objective: to implement the Biological Corridors System as a complementary *in-situ* conservation measure to the NPASP.

Actions:

- a. Develop mechanisms and incentives for the participation of private land owners in the establishment of biological corridors.
- b. Consider a land-use policy based on the recommendations of the Biological Corridors System.
- c. Address the legal status of biological corridors within the Protected Areas System.

C. Agriculture

6.1.7. Objective: to establish agricultural seed and gene banks to maintain material of rare or uncommon species or varieties, not already collected and stored at any of the international seed and gene banks.

Action:

- a. Identify and access financing, location and operational management for the establishment of national seed and gene banks.
- b. Establish live seed banks in the form of agricultural systems.
- c. Establish sites for collection, cultivation and distribution of seeds and plants.

D. Tourism

6.1.8. Objective: to improve infrastructure at tourism sites within and outside Protected Areas.

Action:

- a. Determine the basic needs of tourism sites, identify and access financing, and conduct infrastructural improvement programmes at such sites.

E. Medicinal Plants

6.1.9. Objective: to conserve medicinal plants *in-situ*.

Actions:

- a. Develop Terranova Medicinal Plant Reserve as a pilot project.

- b. Incorporate the conservation and use of medicinal plants in the management plans for Protected Areas, agricultural systems and areas being reforested.
- c. Rescue seedlings of threatened medicinal plant species and reintroduce them into Protected Areas, Terranova Medicinal Plant Reserve, 66 feet 'buffer zones' and areas to be reforested.
- d. Establish at least one (1) Medicinal Trail and one (1) Medicinal Reserve in each District.

6.1.10. Objective: to promote the *ex-situ* conservation of medicinal plants.

Actions:

- a. Include medicinal plants in national and private Botanic Gardens and in Public Parks.
- b. Establish, maintain and expand medicinal plant gardens in primary and secondary schools to complement the medicinal plant syllabus.
- c. Encourage rural and urban people to conserve and grow medicinal plants in their backyards and private lands.
- d. Preserve the seeds of threatened and important medicinal plants in seedbanks.

F. Legal and Policy Framework

6.1.11. Objective: to further develop existing legislation in order to improve *in-situ* conservation.

Action:

- a. Develop Regulations under the National Parks Systems Act to re-classify Protected Areas and to improve the management of Protected Areas by regulating such issues as co-management, sustainable use and the development of management plans.

6.1.12. Objective: to provide policy guidelines for the development of sustainable fishing practices and management, as an *in-situ* conservation approach to Belize's fisheries resources.

Actions:

- a. Develop a National Fisheries Policy focused at sustainable use, research, improved management and *in-situ* conservation.
- b. Update the revised draft of the Fisheries Act to include provisions for the strengthening of fisheries management, as well as other relevant recommendations of the National Biodiversity Strategy and Action Plan.

6.1.13. Objective: to guide agencies which are involved in the enforcement of legislation that impact on forests and wildlife, in order to achieve effective conservation of biodiversity.

Actions:

- a. Develop a comprehensive Wildlife Protection Policy which provides guidance for the sustainable use of wildlife.
- b. Revise the draft Forest Policy to include relevant recommendations of the National Biodiversity Strategy and Action Plan.

6.1.14. Objective: to develop an *ex-situ* Conservation Policy which addresses all related issues including adequate representation of species, repatriation of species held outside of national boundaries, and the registration of collections.

Actions:



- a. Identify and access technical assistance for the development of an *ex-situ* Conservation Policy.
- b. Establish a committee with wide cross-sectorial representation to develop a plan of action for the approval and implementation of the *ex-situ* Conservation Policy .

6.1.15. Objective: to fulfill obligations incurred under international conventions, in addition to the Convention on Biological Diversity, which support *in-situ* and *ex-situ* conservation.

Actions:

- a. Identify and access technical assistance for the development of national legislation to effectively implement CITES.
- b. Maximize participation in the development of a Strategy and Action Plan to implement the Global Climate Change Convention.
- c. Strengthen the implementation of the MARPOL Convention in an effort to minimize the impact of pollution on marine and coastal environments.

## 6.2. LAWS AND POLICY (CBD: Article 6, Article 11, and Article 14)

Existing laws and policies governing Belize's biodiversity are obsolete and do not reflect the regulatory needs of the resources. This problem is compounded by legislative overlaps and lack of enforcement mechanisms, resulting in the existing legal framework being highly ineffective.

Early revisions of present laws as well as the formulation of new laws to specifically address biodiversity must be given priority. Special effort must be made to develop the legal framework necessary in order for Belize to fulfil its obligations under International Conventions and Agreements. In all cases, the inclusion of enforcement mechanisms is indispensable. The reassignment of mandates to agencies with governance over activities affecting biodiversity should be initiated immediately to eliminate legislative overlaps.

### A. Environmental and Land Use Planning

6.2.1. Objectives: to improve institutional coordination in the development and implementation of environment and land use plans.

Actions:

- a. Amend the Land Utilization Act to address the definition, establishment process and management of SDAs.
- b. Establish a legal central coordinating body to be called the Planning Policy Committee (PPC) to make decisions on and facilitate the integration of all planning efforts in the country, and to promote the standardization, coordination and integration of all plans and planning-related activities.
- c. Amend the existing planning legislation to address the issues of institutional coordination-clarification and restructuring of roles. Particular attention should be paid to those institutions that are instrumental in planning yet having insufficient legal authority to plan. This task should be consistent with the Model Physical Planning Bill.
- d. Develop planning Regulations and guidelines to promote the concept of catchment planning.
- e. Develop legal mechanisms and institutional procedures to ensure the implementation of zoning and planning guidelines by all permitting agencies affecting resource use.
- f. Formulate, adopt and implement a strategy to ensure that the land distribution process adheres to the SDAs guidelines and Regulations.
- g. Establish legal and other operational mechanisms to maximize coordination between the DOE and other institutions to address the issue of 'first appraisal' of projects by permitting agencies.

6.2.2. Objective: to improve the integrated planning, management and use of biological resources.

Action:

- a. Formulate, adopt and implement a National Land Use Policy which prioritizes catchment boundary and biodiversity conservation as an explicit objectives in the definition of Planning Units.

B. Fisheries, Coastal and Marine Resources

- 6.2.3. Objective: to improve the policy and legal framework necessary for the proper management of coastal and marine biodiversity.

Actions:

- a. Formulate, adopt and implement Regulations under the Fisheries Act inclusive of enforcement mechanisms, that comprehensively address the collection of aquarium fish, the trawl shrimp fishery, marine scientific research and aquaculture.
- b. Develop the legal framework necessary, inclusive of community evaluation procedures, to empower members of the community to act as 'special constables' to assist in the enforcement of laws affecting coastal and marine biodiversity.
- c. Formulate and adopt an Integrated Coastal Development Policy, which clearly defines the roles of the Fisheries Department, the Lands Department, the Forest Department, the Department of the Environment, the Coastal Zone Management Authority and Local Governments in the implementation of said policy.
- d. Develop the legal and institutional framework necessary to introduce pollution and effluent charges, and for addressing the disposal of municipal and industrial waste in coastal areas.
- e. Formulate and legislate specific Regulations under the Fisheries Act inclusive of enforcement mechanisms, to protect coastal habitats from direct and indirect damage.
- f. Formulate and legislate specific Regulations under the Lands Act inclusive of enforcement mechanisms, to address land clearing on slopes and banks of rivers that cause erosion and sedimentation, and to clarify the rights of the public to beach access.
- g. Formulate, adopt and implement policies that address the construction of piers and sea walls.
- h. Amend the Mines and Minerals Act to make EIAs mandatory, and not discretionary.
- i. Amend the Fisheries Act to include management frameworks for Marine Reserves.
- j. Formulate, adopt and implement policies to address bio-prospecting and intellectual property rights.
- k. Amend all Acts governing coastal and marine biodiversity to include 'exemplary fines' for infractions, as a disincentive for the repeat of violations.
- l. Develop minimum standards for potential members of NEAC and preparers of EIAs.
- m. Prohibit development within Protected Areas and restrict the expansion of those that already exist.
- n. Prohibit the exploitation of marine mammals.
- o. Amend the Mangrove Regulations to require Government Departments to comply with permitting requirements such as to prohibit agricultural and urban development.

- 6.2.4. Objective: to ratify and ensure compliance with commitments under international conventions and agreements.

Action:

- a. Implement commitments under international conventions and agreements.

C. Forest and Wildlife Management

- 6.2.5. Objective: to revise Protected Area legislation regarding the de-reservation process to ensure a more transparent process.

Actions:

- a. Amend the Forest Act and the National Parks System Act to address the de-reservation process.
- b. Promote the formation of a Private Protected Areas Organization.
- c. Amend the National Parks System Act for land owners to incorporate private lands into the Bacalar Chico Marine Reserve and National Park.

6.2.6. Objective: to reduce to 25 acres or less, the area for which an Environmental Impact Assessment is mandatory before subdivision is approved.

Action:

- a. Amend the National Lands Act to address this issue.

6.2.7. Objective: to increase penalties for the violation of natural resource laws.

Actions:

- a. Examine all laws relevant to natural resource use and increase the penalties for violations of these after appropriate consultations with the judiciary, stakeholders and the community at large.
- b. Conduct a workshop with all relevant organizations to review suggested increases in the penalties for violating the relevant laws and to finalize amounts.
- c. Adopt and implement recommendations from (a) and (b) above.

6.2.8. Objective: to improve monitoring and enforcement of all laws relevant to natural resource use.

Actions:

- a. Conduct a workshop with all relevant organizations to closely assess monitoring and enforcement issues.
- b. Identify and access the assistance required to better enforce natural resource laws.

D. Agriculture

6.2.9. Objective: to develop a Sustainable Agricultural Policy that focuses on the conservation of soils, biodiversity, agro-biodiversity, integrated pest management, organic farming, agro-forestry, environmentally friendly farming techniques and food security issues.

Action:

- a. Conduct a review of the current agricultural policy and revise accordingly.

6.2.10. Objective: to include agro-forestry, plantation forestry and the sustainable harvesting of timber and non-timber products, as requirements for the purchase of leasehold lands.

Action:

- a. Revise present Land Use Policy to include agro-forestry, plantation forestry and the sustainable harvesting of timber and non-timber products as requirements for the purchase of leasehold lands.

6.2.11. Objective: to develop monitoring mechanisms for the disposal of wastes and effluents from agricultural and agro-industry operations.

Action:

- a. Review and update the legislative framework for the disposal of waste and effluents to establish a

coordinated approach to monitoring.

6.2.12. Objective: to introduce incentives for ecologically sound investments.

Action:

a. Conduct a series of consultative meetings to develop incentives for ecologically sound investments.

6.2.13. Objective: to introduce legislation to provide for exemplary fines to be levied on companies or individuals that inadequately dispose of environmentally damaging waste.

Action:

a. Amend the Environmental Protection Act to include exemplary fines for inadequate disposal of wastes harmful or damaging to the environment.

#### E. Tourism

6.2.14. Objective: to develop a Tourism Policy that is cognizant of biodiversity and environmental issues.

Action:

a. Review the proposed Tourism Strategy Plan and modify to address biodiversity and environmental issues.

b. Monitor tourism carrying capacity for all sites visited by registered tour guides with tourists, in order to determine when tourism visitation becomes a threat to biodiversity.

#### F. Medicinal Plants

6.2.15. Objective: to strengthen the Regulations governing the harvesting, use and trade of medicinal plants, especially for wild and threatened species.

Actions:

a. Introduce the revised permitting system for the collection of medicinal plants.

b. Amend the Forest Act to address the harvesting and extractive use of medicinal plants.

c. Empower park and other wardens to enforce the permitting system.

d. Introduce a certification/registration system for traditional healers (to be organized and managed by traditional healers groups/organizations).

e. Enact relevant legislation to protect knowledge of traditional healers.

6.2.16. Objective: to develop a National Bio-prospecting Policy to guide the harvesting and use of medicinal plants.

Actions:

a. Appoint a committee with responsibility to draft a National Bio-prospecting Policy addressing the harvesting and use of medicinal plants.

b. Conduct wide range consultations with stakeholders.

c. Develop and write the National Bio-prospecting Policy.

#### G. Legal and Policy Framework

6.2.17. Objective: to reduce overlaps within legislation which impacts on biodiversity conservation and sustainable use.

Actions:

- a. Review the Forest Act and the Lands Utilization Act to identify and correct those areas of legislative overlap, especially relating to the use and management of water and watersheds.
- b. Review the Forest Act, the National Parks Systems Act and the Fisheries Act to identify and correct those areas of overlap relating to the designation and management of Protected Areas and to the protection of species.
- c. Review the Environmental Protection Act, the Environmental Impact Assessment Regulations, the Forest Act, the National Park Systems Act and the Fisheries Act to identify and correct areas of overlap and ambiguity.

6.2.18. Objective: to develop the legal and policy framework for the sustainable use of water resources.

Actions:

- a. Conduct consultations with the Private Sector, NGOs, CBOs and Government agencies on the mechanisms for the sustainable use of water resources.
- b. Review data available on water resource use in Belize and convene a workshop to discuss recommendations.
- c. Develop appropriate legislation and regulations.

6.2.19. Objective: to provide guidance for the conservation of biodiversity in private reserves.

Action:

- a. Formulate, adopt and implement a policy to regulate the establishment and management of private reserves.

6.2.20. Objective: to provide legal protection for all watersheds, estuaries and wetlands.

Actions:

- a. Develop Regulations under the Forest Act.
- b. Conduct consultations with major stakeholders, NGOs, CBOs and the community at large to discuss draft Regulations.

### **6.3. Human and Institutional Capacity for the Conservation and Sustainable Use of Biodiversity (CBD: Article 12, Article 13 and Article 18)**

Institutions with responsibilities for the management and development of Belize's biodiversity do not possess the infrastructure or human resources necessary to effectively perform their functions. Most of the available staff lack technical training. Primary users and other stakeholders of biological resources are not sufficiently exposed to sustainable methods of ~~exploitation~~ <sup>utilization</sup> and to the rationale for biodiversity conservation.

Obtaining trained personnel and conscious stakeholders are an utmost priority. Human and institutional capacity building will be undertaken in collaboration with international partners and technology transfer will be an integral part of institutional strengthening. Institutions must be equipped with at least the minimum infrastructure necessary to ensure efficiency.

#### **A. Environmental and Land Use Planning**

6.3.1. Objective: to improve and strengthen Environmental and Land Use Planning for regional and sub-regional areas.

**Actions:**

- a. Strengthen the Special Development Area (SDA) program by assigning more human resources trained in GIS (by the LIC) to the existing GIS facility of the Ministry of Natural Resources and the Environment.
- b. Provide training in Environmental and Land Use Planning for the technical staff of agencies involved in the management of coastal resources.
- c. Establish a post and provide training for a Planner-Community Liaison Officer at the Department of Housing and Planning, to work with communities to develop, implement and monitor compliance with plans.
- d. Provide training in catchment planning to all institutions and NGOs involved in conservation planning.

**B. Information and Geographical Information Systems (GIS)**

- 6.3.2. Objective: to maximize the use of information technology (GIS) in the planning and management of biological resources.

**Action:**

- a. Provide practical training to resource managers, scientists and data managers on fundamental GIS concepts and on the "Application of GIS for Planning".
- b. Training in Environmental Information Management for all CEDS members and other organizations involved in GIS and biodiversity data collection and management.
- c. Provide technical assistance and training to revamp non-operational GIS/CEDS members and to build personnel capacity for GIS management.
- d. Conduct training in "Spatial Analysis Techniques in GIS" for all GIS data managers to facilitate the synthesis of existing data and development of "derived data-sets".

**C. Fisheries, Coastal and Marine Resources**

- 6.3.3. Objective: to make decisive investments in staffing, training and institutional infrastructure.

**Actions:**

- a. Identify and access specialized training courses on Biodiversity Management for personnel from Government, NGOs and the Private Sector.
- b. Identify and access specialized training courses on the Integration of Fisheries and Aquaculture in Coastal Zone Management for staff of the Fisheries Department.
- c. Identify and access specialized training courses on Sustainable Fisheries Development Planning for the technical staff of the Fisheries Department.
- d. Increase technical staffing at the Fisheries Department, the Forest Department, the Lands Department, the Office of Petroleum and Geology and the Department of the Environment.
- e. Acquire the hardware, software and training necessary for Internet connection at all agencies involved in the management of biological resources, so as to maximize access to information.
- f. Develop a system for the shared use of equipment between agencies.
- g. Train NEAC members to the level of expertise necessary to conduct robust technical evaluation of EIAs.

- 6.3.4. Objective: to establish mechanisms that are suitable for achieving a change of attitude by users of Belize's coastal and marine resources.

**Action:**

- a. Conduct frequent training programs for fishers on the use and benefits of less destructive fishing methods and on the biology of targeted species.

D. Forest and Wildlife Management

6.3.5. Objective: to increase the capacity of resource managers and users to sustainably manage forest and wildlife resources.

Actions:

- a. Conduct workshops on biodiversity conservation, sustainable forest management and low-impact logging.
- b. Develop and implement training programmes for the establishment of small businesses (e.g. non-timber forest products) at the community level.
- c. Develop and implement training and education programmes for Village 'Alcaldes' and Village Chairmen to enhance their capacity to monitor illegal activities in forestry and hunting.
- d. Invest in equipment, specimen storage and data storage at the Forest Department.
- e. Conduct training workshops on basic identification skills so that such resource managers are able to use identification guides and correctly identify species of conservation concern.

6.3.6. Objective: to increase the technical, extension and management capabilities of the Forest Department.

Actions:

- a. Assess and prioritize training requirements of the Forest Department staff.
- b. Identify and access funds to meet costs of training.
- c. Develop realistic budgets required to manage the Forest Reserves and Protected Areas.
- d. Establish post of Forest Ranger for the Corozal District.
- e. Increase royalties on forest products, timber and NTFP to better reflect the value of the resource.

E. Agriculture

6.3.7. Objective: to improve the human resource capacity of the Pesticides Control Board and the Department of Agriculture to provide training to farmers on the requirements of the Pesticides Control Act.

Actions:

- a. Conduct training workshops for farmers on the Pesticide Control Act.
- b. Produce Pesticide Training Manuals and information sheets on the Pesticides Control Act for distribution to farmers.

6.3.8. Objective: to strengthen the Ministry of Agriculture, Fisheries and Cooperatives to extend technology and information to farmers and the general public on biodiversity-related issues in the Agriculture Sector.

Actions:

- a. Conduct an assessment of extension capabilities of the Agriculture Department staff to farmers and identify their training needs.
- b. Recruit additional personnel, implement training and purchase capital equipment to increase extension capabilities of the Agriculture Department.

6.3.9. Objective: to strengthen supporting training organizations.

Actions:

- a. Conduct an assessment of the training capabilities of supporting institutions.
- b. Identify and access funding necessary to undertake strengthening programme.
- c. Recruit additional personal, implement training and purchase capital equipment for supporting institutions.
- d. Curriculum and textbook development on local sustainable cultivation of agro-forestry systems.
- e. Train 60 persons per year in sustainable agriculture and conservation and the creation of demonstration sites of sustainable agricultural systems.

6.3.10. Objective: to improve environmental monitoring.

Actions:

- a. Conduct an assessment of monitoring capabilities at all relevant agencies.
- b. Develop a plan for a coordinated approach to monitoring and testing of the environment.
- c. Improve testing facilities to include training for staff and community level personnel to assist in monitoring and sample collection.

F. Tourism

6.3.11. Objective: to strengthen the Ministry of Tourism.

Actions:

- a. Review the structure of the Ministry of Tourism and the Environment and make recommendations to Cabinet for its restructuring, including equipments and personnel, consistent with the importance of tourism to the economy of Belize.

6.3.12. Objective: to strengthen Community Based Organizations involved in tourism to improve their sustainability.

Actions:

- a. Conduct a series of workshops on the opportunities and potential problems in the Tourism Sector.
- b. Conduct a series of workshops on management, book-keeping, public relations, marketing and leadership training.
- c. Establish mechanisms for financial support to CBOs.

G. Medicinal Plants

6.3.13. Objective: to strengthen institutions involved in the management of medicinal plants and improve their credibility.

Actions:

- a. Conduct training courses for park wardens on relevant management Regulations.
- b. Train community health workers, nurses and doctors on the use of medicinal plants.
- c. Organize and conduct ethnobotanical training courses for school teachers.
- d. Train local researchers to conduct scientific research.
- e. Sensitize policy makers on the value of medicinal plants.
- f. Prepare and publish annual reports with audited financial statements for NGOs and other institutions involved with medicinal plants.
- g. Develop a national laboratory to conduct initial screening on the effectiveness of plants as medicine.



H. Legal and Policy Framework

6.3.14. Objective: to provide training in environmental law to all law enforcement officers and to the judiciary, including natural resource policies and the rationale for them.

Actions:

- a.. Provide training on the Substantive Legislation relating to the Wildlife Protection Act, the National Parks Systems Act, the Forest Act, the Fisheries Act, etc.
- b. Provide training on methods of arrest, evidence gathering and prosecution.

6.3.15. Objective: to provide training in Environmental and Natural Resource Laws to Non-Governmental Organizations and Community Based Organizations responsible for management of Protected Areas.

Action:

- a. Train CBOs, NGOs and managers of Private Reserves on the Substantive Legislation relating to natural resource management.

6.3.16. Objective: to develop an efficient permitting system to manage the removal of flora and fauna from Protected Areas.

Action:

- a. Develop draft Permits and conduct public consultations for them to be discussed and approved.

6.3.17. Objective: to appoint park rangers as 'special constables' in marine and terrestrial Protected Areas which are co-managed by Non-Governmental Organizations or Community Groups.

Actions:

- a. Draft Legislation allowing 'special constables' to be appointed.
- b. Train the 'special constables' in Environmental Legislation, enforcement techniques and prosecution of cases in court.

6.3.18. Objective: to strengthen the human and institutional capacity of the Ministry of Natural Resources and the Environment and the Ministry of Agriculture, Fisheries and Cooperatives to increase their enforcement capabilities.

Actions:

- a. Provide the Fisheries Department and the Conservation Division with such equipment and vehicles as necessary to do monitoring.
- b. Increase the number of personnel engaged in the monitoring and enforcement of legislation pertaining to Protected Areas.

**6.4. RESEARCH, MONITORING AND SUSTAINABLE USE OF BIODIVERSITY (CBD: Article 7, Article 10, Article 12, Article 14)**

Unsustainable harvesting practices and indiscriminate killings are quite evident for both terrestrial and marine resources. Structured and focused management approaches have been minimal for activities related to the exploitation of biological resources, resulting in the arbitrary use and imminent depletion of stocks. Management measures are developed based on the availability of quality data. Though much research have

been conducted on biological resources in Belize, these are not management-oriented research, thus the data produced have little or no immediate application to management.

Focused research must be a permanent activity that will allow proper monitoring and will continuously provide the data necessary on which to structure management measures and development policies.

A. Environmental and Land Use Planning

6.4.1. Objective: to develop environmental and land use plans to promote the sustainable use and protection of biological resources.

Action:

- a. Develop, adopt and implement sub-regional land use plans (e.g. SDAs) for areas outside Protected Areas.

B. Information and Geographical Information System (GIS)

6.4.2. Objective: to identify, monitor and reduce threats to important biological resources.

Actions:

- a. Using GIS and other techniques, assess, identify and prioritize important components of biodiversity to be monitored, with particular focus on ecosystems, critical habitats, threatened species and biological processes.
- b. Using GIS, sampling and other techniques, develop and implement a National Biodiversity Monitoring Program (NBMP) to monitor threats to important components of biodiversity.
- c. Investigate and explore monitoring strategies that involve local communities.
- d. Develop a Biodiversity Monitoring Team (BMT), made up of both trained field biologists and technicians, to conduct baseline inventories for monitoring purposes and to address activities threatening biodiversity as identified by the monitoring program.
- e. The National Biodiversity Monitoring Program (NBMP) should participate in regional biodiversity monitoring efforts of Selva Maya and use standardized monitoring techniques agreed upon regionally.

C. Fisheries, Coastal and Marine Resources

6.4.3. Objective: to conduct research that will provide the information necessary to obtain the sustainable development of coastal and marine biodiversity and to avoid arbitrary exploitation.

Actions:

- a. Explore the legal and socio-economic circumstances of applying the 'limited access' concept to the conch and lobster fisheries, as a necessary management measure.
- b. Explore the biological, legal and socio-economic circumstances of closing the Nassau grouper fishery for a period not less than three (3) years, while research to better understand the reproduction of the species are conducted.
- c. Explore the biological, legal and socio-economic circumstances of (1) substantially reducing fishing effort by shrimp trawlers, (2) total closure of the marine aquarium fishery.
- d. Investigate the biology and market potential of inshore non-traditional fish species, to determine the possibilities of diversification from the traditionally fished species.
- e. Conduct joint fisheries exploratory research in Belize's Exclusive Economic Zone with countries such as Mexico and Cuba, to determine the feasibility of deep-sea fishing as a major avenue for diversification, providing protection for shallow inshore habitats.
- f. Identify and access information on selective methods of *Tilapia* harvest used in other parts of the world &

- g. promote selective exploitation in rivers and lagoons of Belize as a measure to minimize its population growth with the objective of determining suitability of such methods for Belize. Conduct a comprehensive analysis of the freshwater fishery with focus on gears, fishing effort, species, socio-economic structure and trends.
- h. Conduct a detailed research on the reproduction of the hicatee, with the objective of reviewing the existing closed season.
- i. Investigate the feasibility of a mangrove replenishment program in seriously altered coastal habitats.
- j. Research spawning aggregations of all species that might merit protective status.

6.4.4. Objective: to formulate and implement a system of incentives for ecologically sound developments in coastal areas.

Actions:

- a. Explore the feasibility of providing tax reduction or exemption for ecologically sound investments.
- b. Identify and access information on successful systems of incentives used in other countries in the region.

6.4.5. Objective: to promote sustainable exploitation such as 'catch and release' sport fishing.

Action:

- a. Explore the biological, legal and socio-economic circumstances of restricting the exploitation of species such as snook, tarpon, permit and marlins, to 'catch and release' sport fishing.

#### D. Forest and Wildlife Management

6.4.6. Objective: to document forest and wildlife resources including population and habitat distribution.

Actions:

- a. Identify human and institutional resources necessary to undertake these activities.
- b. Forest Department to establish working relationships with institutions such as UCB, to jointly conduct research.
- c. Forest Department to issue permits for all research activities and establish a reporting protocol, to ensure access to the findings of the research, including the establishment of "bonds" to be deposited by researchers at the FD.
- d. Identify and document plants in littoral forests and other under-represented habitats.

6.4.7. Objective: to conduct research focused at the conservation of biodiversity in Belize.

Action:

- a. Pursue biodiversity conservation studies/programs with focus on habitat requirements, distribution and diversity of species, endangered and endemic species, the identification of migration paths, population trends, and assessment of damages caused to livestock and agricultural activities by wildlife species such as birds and cats.

6.4.8. Objective: to identify the research needs for sustainable forest and wildlife management.

Actions:

- a. Convene a stakeholders workshop to identify research needs for sustainable forest and wildlife management.

- b. Utilize the results of the 'needs identification workshop' to assist in the establishment of research priorities.

6.4.9. Objective: to develop and implement management plans for Forest Reserves, National Lands and Protected Areas, based on ecologically sustainable forest management practices.

Actions:

- a. Identify and access funding for the development of a National Forest Inventory and for the preparation of management plans for all Forest Reserves and Protected Areas.
- b. Develop a Reforestation Policy.
- c. Identify and access funding for reforestation projects in the Corozal District and other areas including river banks and upland areas.
- d. Investigate the feasibility of agro-reforestation as a System of Sustainability (SOS).

6.4.10. Objective: to implement the New Forest Licensing System proposed by the Forest Planning and Management Project.

Actions:

- a. Forest Department to ensure that proper procedures are followed in issuing timber licenses, especially on private lands.
- b. Establish a Forest License Monitoring System that includes the participation of NGOs.
- c. Update and improve the database on Forest Licenses.

6.4.11. Objective: to strengthen the monitoring of forest management activities in the Mountain Pine Ridge Forest Reserve.

Action:

- a. Forest Department to increase its personnel and consider the reallocation of staff and resources, to better ensure compliance with the management plan and other licenses within the Mountain Pine Ridge Forest Reserve.

6.4.12. Objective: to ensure that short term forest licenses are not reissued, but kept to amalgamate areas into sustainable forest management units.

Actions:

- a. Forest Department to stop the fragmentation of forest license areas.
- b. Forest Department to advise current license holders of this situation.

6.4.13. Objective: to restructure the forest industry to work within the Annual Allowable Cut (AAC), to include more value added, the use of more secondary timber species, and to recognize the cost of establishing Forest Plantations as an integral part of the overall exploitation cost.

Actions:

- a. Reduce the number of sawmills from the present 45 to a number consistent with reduced logging.
- b. Forest Department to license saw mills as a requirement for legal operation, with preference for those using band mills, with value-adding facilities, and those which take environmental concerns into account.
- c. Require the conversion of mahogany logs by use of band mills only, except where chain saw permit is justified.

- d. Gradually reduce the exportation of mahogany and promote its use for value-added products such as furniture and plywood.
- e. Encourage the use of other secondary hardwood species by providing incentives such as reduced royalties on species being promoted.
- f. Sensitize the local market to understand that customary long lengths and widths of timber are not available in the traditional species, and that these must be substituted by smaller components.
- g. The timber industry to realize that traditional logging has to give way to sustainable logging, including more care to avoid damage to the remaining trees or face restrictions, fines or both.
- h. Reduce illegal logging activities to the minimum possible by intensifying monitoring activities.
- i. Determine the economic feasibility of exporting lumber derived from zericote, mahogany and rosewood, etc., as compared to value-added products made from these same woods.

6.4.14. Objective: to identify and monitor the use of non-timber forest products.

Actions:

- a. Forest Department to continue the work started by FPMP in quantifying the value of the non-timber resource:
  - i. Orchids, bromeliads, Xate palms and other ornamentals.
  - ii. Thatch, poles, lobster trap material (palmetto), basket tie-tie, and bayal.
  - iii. Edibles from the wild: mamey, sapodilla, cocoplum, coconoboy, supa, sakpa, cherry, cabbage palm, chib and sea grapes.
- b. Involve NGOs in monitoring the use of NTFP.
- c. Conduct training workshops for collectors and the community at large, on the value and sustainable use of NTFP.

6.4.15. Objective: to create mechanisms to ensure that a portion of investments directed at natural resource exploitation be used for the conservation, use of or research/management of the resource.

Action:

- a. Concessions for natural resource exploitation to include allocation of funds for the conservation, use of or research on the resource.

6.4.16. Objective: to ensure proper management of wildlife hunting activities.

Actions:

- a. Implement better control of wildlife hunting for domestic use.
- b. Develop and implement a quota system for the exploitation of wildlife species for domestic consumption.
- c. Explore agreements with private landowners to obtain access for game hunting in areas adjacent to Protected Areas or 'buffer zones'.

6.4.17. Objective: to seek expert advice on the ranching of crocodiles, deer, gibbon, peccary and iguana, in an effort to replenish and reduce exploitation of wild stocks.

Actions:

- a. Request assistance from IUCN or FAO on rearing methodologies.
- b. Make representations to CITES to allow for ranching and commercialization of these species.
- c. Explore the feasibility of developing joint-venture projects with institutions known to have experience in this area.
- d. Develop pilot projects for the species mentioned above, involving local communities.
- e. Conduct training workshops for local communities on the ranching of the above species.

6.4.18. Objective: to conduct research and development of NTFP and develop niche markets for new products.

Actions:

- a. Identify domestic and export markets for individual species and products.
- b. Conduct developmental research on species identified to be potentially marketable.

E. Agriculture

6.4.19. Objective: to develop mechanisms to encourage basic and developmental research in the agricultural sector, including the impact of pests, and to address property rights issues associated with the results of such research.

Action:

- a. Conduct a series of consultative meetings to develop suitable mechanisms and incentives for Private Sector involvement in basic and developmental research in the agricultural sector.
- b. Conduct research (1) to assess the impact of agriculture on biodiversity; (2) assess the importance of pests in agriculture; (3) to assess the impact of Integrated Pest management (IPM) and alternative control measures and (4) to assess the threat of introduction of pest species and bio-control agents.

6.4.20. Objective: to document small farmers knowledge of biodiversity.

Actions:

- a. Conduct workshops on research techniques for small farmers.
- b. Formulate and implement project to research and document indigenous farmers knowledge.
- c. Collect information from traditional knowledge on useful (edible, medicinal, construction, etc.) plants.
- d. Prepare a ' **Plants Use Table** ' to favor sustainable cultivation of timber and non-timber, domestic useful plants and other forest products.

F. Tourism

6.4.21. Objective: to develop and implement marketing of tourism emphasizing Belize's biodiversity.

Action:

- a. Prepare and distribute (nationally, regionally and internationally) small brochures targeting specific groups, e.g. Bird-watchers, rainforest, wetlands, insects, culture, reef, etc.
- G. Medicinal Plants

6.4.22. Objective: to promote the sustainable harvesting of medicinal plants from the wild.

Actions:

- a. Restrict the harvesting and monitor its effects on threatened medicinal plants from the wild.
- b. Establish guidelines for the harvesting of medicinal plants.
- c. Improve the techniques for harvesting and storage.

6.4.23. Objective: to promote the cultivation of medicinal plants in an effort to reduce the exploitation of wild stocks.

Actions: