2.4.4.1. Functions and Powers of Biodiversity Management Board.

All powers of the management of the National Biodiversity Centre shall be vested with the Biodiversity Management Board.

Mandates

- To oversee the implementation of the Biodiversity Action Plan
- To develop national policy framework that foster the sustainable use of biological resources and the maintenance of biodiversity
- To strengthen capacity for sustainable conservation and utilization of biodiversity
- To create conditions and incentives for effective biodiversity conservation.
- To catalyze conservation actions through international co-operation and national planning.

Terms of Reference of the Biodiversity Management Board

- Supervise and issue directives for smooth management of National Biodiversity Center.
- Authorize technical operations in conservation and sustainable utilization of biological resources
- Provide policy and legal guidance along the process of implementing the biodiversity action plan
- Approve project proposals, secure funds to support projects and authorize fund disbursements.
- Approve annual work plans, annual budget proposals and Five-year plan proposals.
- Negotiate and formalize collaborations at the international and regional levels in biodiversity thematic areas.
- Facilitate institutional capacity development through the provision of adequate and appropriate human resources along with the prospects for career and skill advancement
- Monitor and evaluate the performance and achievements of National Biodiversity Center
- Review progress and administer contextual action.
- To provide a forum for continuing dialogue and debate among interested parties on the options for action to save, study and use biodiversity sustainably and equitably.
- Provide advise on priorities for research, funding and action.
- Review and reform existing policies that overlook biodiversity considerations and adopt new public policies that support conservation
- Incorporate biodiversity conservation into the management of biological resources for socio-economic development
- Integrate the conservation of species, population and genes into the management of protected areas system
- Integrate biodiversity concern into education and training curricula
- Formalize collaboration with local communities NGOs and private sector institutions in conservation and sustainable use of biological resources
- Develop the Terms of Reference for subsequent elaboration of the Biodiversity Action Plan.

2.4.5. The Renewable Natural Resources Sector

2.4.5.1. Ministry of Agriculture (MoA)

The Ministry of Agriculture comprises of the three Renewable Natural Resources (RNR) sectors of agriculture, animal husbandry and forestry. During the restructuring exercise carried out by the Royal Government in 2000, the three technical divisions of Research Extension and Irrigation Division (REID), Forestry Services Division (FSD) and the Crop and Livestock Services Division (CLSD) were upgraded to the current Department of Research and Development Services (DRDS), Department of Forestry Services (DoFS) and the Department of Agriculture and Livestock Support Services (DALSS) respectively. Further three new offices of Quality Control and Regulatory Services (QCRS), RNR Information and Communication Services (RNR-ICS) and National Biodiversity Center (NBC) were established and given non-departmental status directly

responsible to the secretariat. An Internal Audit Unit was also established directly under the secretariat. The Administration and Finance Division and the Policy and Planning Divisions continued to provide support functions to the Ministry. Besides the Natural Resources Training Institute (NRTI), Druk Seed Corporation (DSC), Forestry Development Corporation (FDC) and the Food Corporation of Bhutan (FCB) are all closely involved with the Ministry.

2.4.5.2. Department of Research and Development Services (DRDS)

The Department of Research and Development Services coordinates and implements renewable natural resources research and development programs throughout the country in improving the overall productivity and sustainability of agriculture, horticultural, forestry and livestock enterprises. Three functional divisions within the Department are structured for research, extension and engineering programs for all the three sub-sectors of agriculture, livestock and forestry. DRDS is responsible for research, extension and irrigation services for all the three sub-sectors of agriculture, livestock and forestry. Its research operations are implemented through four integrated research centers known, as Renewable Natural Resources Research Centers (RNR-RCs) located at Yusipang (Thimphu), Bajo (Wangduephodrang), Jakar (Bumthang) and Khangma(Trashigang). Each of the centers has a national mandate for coordination of research in one of the four major fields of research, i.e. forestry (Yusipang), field Crops (Bajo), livestock (Bumthang) and horticulture (Khangma). Each of these centers have a multi-disciplinary team of scientists. The extension and irrigation services are carried out through the dzongkhag administration concerned supported by several donor-assisted projects. There are thirty-five RNR centers, one hundred and fifty-nine Agricultural Extension Centers and one hundred sixty-two Livestock Extension Centers including 20 veterinary hospitals.

2.4.5.3. The Department of Forestry Services (DoFS)

The Department of Forestry Services is entrusted with the responsibility of the management of the forest resources and biodiversity. DoFS fulfills its mandate through four functional divisions such as Forest Protection and Utilization Division, Forest Resource Development Division, Nature Conservation Division and Forest Extension Division. There are eleven territorial divisions and five operational national parks/sanctuary offices that implement field activities. Bhutan Forestry Institute trains forest guards that act as a source of trained personnel for field programs. The primary focus of the DoFS is to ensure that at least 60% of the country's area is maintained under forest cover at all times, and conserve the rich biological diversity through the establishment of an effective network of protected areas.

2.4.5.4. The Department of Agriculture and Livestock Support Services

The Department of Agriculture and Livestock Support Services consists of Crop Production Division, Livestock Production Division and Livestock Health Division. It is responsible for the organization, production, procurement, supply and distribution of forms of inputs ranging from agricultural seeds to livestock breeding animals. It is also responsible for veterinary laboratory services and runs a network of regional veterinary laboratories and district veterinary hospitals backed up by the Royal Veterinary Epidemiology Center at Serbithang. The department also monitors the end-use of the inputs and services that it is providing. The department has two Mithun breeding farms, one Jersey Breeding Farm, one Brown Swiss Cattle breeding farm, one Sheep breeding farm, one Horse breeding program, two Pig breeding centers, two Poultry breeding centers and a semen processing center. It has a National Nublang Breeding Farm, which through its Open Nucleus Breeding Schemes breeds and maintains the indigenous breed of Siri cattle. It also looks after the Agriculture Machinery Centers and works closely with the Druk Seed Corporation.

2.4.5.5. Quality Control and Regulatory Services (QCRS)

The Quality Control and Regulatory Services was institutionalized as a perpetual, public-sector instrument to promote the quality of goods and services related to the Ministry of Agriculture and its clients; and coordinate and liaise with other agencies related to regulations and quality of the products that are locally produced and also those imported. With its crosscutting mandates encompassing the three sub-sectors of the renewable natural resources, this organization has been conferred with a non-departmental status. It was officially inaugurated on August 5, 2000 and is headed by the Executive Director. It is governed by the Management Board with the Minister of Agriculture as Chair and Secretary as Vice Chair and senior officials from both within and outside MoA as members. It has two divisions, which are Quality Control and Quarantine Division, and Analytical & Certification Division. Besides, it also has nationwide coverage with offices in all the dzongkhags, regions, major entry points and Thimphu town, which are managed by the Regulatory Inspectors. This network also controls entry and exit of protected biodiversity.

2.4.5.6. Information and Communication Services (ICS)

Information and Communication Services is the communication arm of the Ministry of Agriculture. It was established in 1992 as the Information and Publication Unit (IPU) under the Department of Research and Development Services (DRDS). It was renamed as the Farmer-Extension Communication Support Unit (FECSU) in 1993. With the restructuring of the MoA in 2000, FECSU was changed to Information and Communication Services (ICS) and given a non-departmental status, directly responsible to the secretariat. It consists of four functional sections, which are: Publication Section, Audio/Video Section, Information Technology Section and One Stop Information Shop Section. Its mandate is to design, develop, and produce information and communication materials in support to the RNR programs, serve as the portal of RNR information and activities and promote RNR programs and activities.

2.4.5.7. Natural Resources Training Institute (NRTI)

The Natural Resources Training Institute offers integrated training to the technical support staff and extension agents of the RNR sector. It is mandated to conduct diploma courses for extension agents and conduct in-service courses for extension agents.

2.4.5.8. Bhutan Forestry Institute (BFI)

The Bhutan Forestry Institute trains forest guards that act as a source of trained personnel for field programs.

2.4.5.9. Druk Seed Corporation

The Druk Seed Corporation is mandated to produce and supply seeds and seedlings; procure and distribute fertilizers; and produce and export high value vegetable seeds

2.4.5.10. Forest Development Corporation

The Forest Development Corporation is responsible for the sustainable harvesting of timber and timber products, marketing and forestation.

2.5 Policy and Legislation related to Biodiversity

2.5.1 Overview

Bhutanese people have a culture and lifestyle, which are closely related to the surroundings in which they live. They have often developed sustainable methods of managing the resources they use. The national policy and strategy resolved in the proceeding "Towards Sustainable Development in Unique Environment (Planning Ministry, 1992) stressed the following needs:

- sustainable use of natural resources, including biodiversity;
- strengthening existing institutions, including environmental impact assessment;
- promotion of conservation ethics and environmentally sound farming systems;
- community participation in the management and protection of natural resources;
- revision of the forestry policy and legislation; and
- human resource development;

The overall policy objectives of the RGOB for Biodiversity are that

I. biodiversity issues will be integrated into the economic development plans and programmes;

II. special attention will be given to support parks and protected areas and effective buffer zones management; and

III. information on biological diversity will be developed for conservation and sustainable utilisation of Biodiversity resources.

Bhutan's policies on biodiversity parallel those of the Convention on Biological Diversity, particularly those, which specify that:

- Conservation of biological diversity is a priority national objective;
- Any use of biodiversity components must be sustainable; and
- There should be fair and equitable sharing of the benefits arising out of biological resources.

2.5.2 National and Sectoral Policy and Legislation which May Affect Biodiversity

2.5.2.1. General

There are master plans and strategies for the development of important sectors along with numerous by-laws and acts. All of these and others have the potential to impact biodiversity negatively or to assist in its conservation, depending on how much attention is given to issues of biodiversity conservation. Examples include the following:

- Afforestation Strategy
- Agro-biodiversity Policy and Legal Framework, being undertaken under
- Arable Agricultural Development Policy and Strategy
- Bhutan Forest Master Plan
- Bhutan Land Act
- Bhutan Power Master Plan
- Cooperatives Act
- Environmental Assessment Act
- Farm Road Construction Guidelines
- Forest and Nature Conservation Act of Bhutan
- Forest and Nature Conservation Rules of Bhutan
- Forestry Subsector Development Policy and Strategy
- Geog Planning Policy and Process
- Horticulture Master Plan
- Land Swapping Policy
- Land Use Master Plan
- Live Watershed Management and Social Conservation Act
- Livestock Development Policy and Strategy
- Mining Act
- National Eco-Tourism Policy and Strategy
- National Environment Protection Act (under preparation)
- National Environmental Education Strategy (under preparation)
- National Environmental Strategy – The Middle Path
- National Irrigation Policy
- National Pasture Policy

- NBC through the ABC project funded by the Netherlands.
- Pasture Policy (Draft)
- Pesticides Act
- Plant Quarantine Act
- Seeds Act

See also the following section below:

2.5.2.2. Forest Policy

Most direct biodiversity legislation falls under the Forest Legislation. At present the majority of Bhutan's environmental legislation concerns the conservation of forests and the protection of wildlife and wildlife habitat. Over the last few decades the Royal Government of Bhutan has come to recognize that if its forest estate was not to go through a process of deterioration similar to some of its neighbors, a systematic forest management program would have to be put in place. This would have to be based on a balancing of conservation and economic development goals through long term, sustainable, multipurpose forest management.

The 1974 forest policy envisages that 60% of the land area should be under forest cover and recognized the need for forest demarcation, inventory, and preparation of management plans. The 1979 policy statement was more conservative in its approach to utilising forest resources and restricted logging by commercial operators. The preparation of the forest policy statement of 1991, the decentralization and privatization policy, the wood pricing and marketing policy, the social forestry rules (1990) and the Forest and Nature Conservation Act, 1995 are evidence of the government's determination to develop a firm policy and strategy for the future.

Within the policy guidelines of 1991, there is a set of General Principles for biodiversity conservation in forest management in Bhutan, as follows:

- National forest policy and planning should recognize biodiversity conservation as a major development goal;
- A national system of protected areas should be established that is representative of all ecological zones and types, and protect areas of high biodiversity and endemism and rare or endangered species and associations;
- Protected areas should be linked by corridors of natural forest and surrounded by buffer zones;
- The greatest proportion of the country's natural forest areas should be dedicated to multi-use, multi-purpose management where biodiversity conservation is one of the major management objectives;
- Riparian areas should be reserved, accorded special management status and incorporated into a network of continuously-connected biodiversity reserves within the working forest providing both horizontal and vertical ecological linkages through the landscape;
- Silvicultural systems should conserve biodiversity composition, structure and function, and thus be based as closely as possible on natural ecosystem disturbance patterns;
- In order to retain the full range of natural forest age classes, portions of the working forest should be managed under very long felling cycles, while others should be reserved in perpetuity and incorporated into the ecological network (re 5 above)
- The distribution of logged and unlogged areas should be managed to maintain ecological corridors and prevent ecological fragmentation;
- Within felling coupes, "keystone" biodiversity assets with important ecological functions, such as wildlife food and habitat trees, snags and coarse woody debris, should be retained in both harvesting and stand tending operations; and
- Biodiversity status of forest management areas should be assessed at regular intervals (5-10 years) through comprehensive surveys and between these major censuses there should be annual monitoring of easily identifiable indicator species.

At the present moment the rules and regulations supporting the Forest and Nature Conservation Act are under review and will be approved within 1998. Rules and regulations for medicinal plants, resin, natural dyes, bamboo and cane have been enacted. However, no legislation, rules or regulations have yet been enacted for essential oils, mushrooms and other forest products. (FAO, 1996).

2.5.2.3. Decentralization policy

The policy on decentralization is a recent development within the policy framework for the RGOB, where all possible programs that have a direct impact on the local people or their participation are to be decentralized. This policy came into effect at the beginning of the 7th FYP period. The decentralization and zonation policy implementation of the past provided sufficient experiences for the selection of appropriate forestry programs and other activities to be decentralized.

2.5.2.4. Tourism Policy for Protected Areas

The RGOB recognizes the negative impacts, which unregulated or excessive tourism can have on a nation's culture and biodiversity. Experience in neighbouring countries has emphasized this key point. Consequently, the government has set a policy of limiting the total number of tourists and is seeking to implement this policy by imposing a relatively high blanket fee for all tourists other than Indians.

With respect to tourism policy directed toward biodiversity, in the protected areas, especially JDNP, which has a number of tourists trekking through the park, the tourism policy is as follows:

- Tourism and visitation will be allowed within the park, but will be secondary in priority to nature conservation and the needs to protect the ecosystem and the need to prevent adverse effects on the social, cultural and traditional integrity of the local communities;
- Tourism practices will be based on the principle of sustainability, they must be environmentally and ecologically friendly, and socially and culturally acceptable;
- Tourism and tourists will be confined to designated visitor zones;
- Tour operators will be held accountable for violation of park rules by visitors and guides, and will be fined and/or their licenses revoked under the regulations of the Department of Tourism. A park-entry fee will be charged from foreign visitors, which will be used for local development and park management (NCS, 1996).

2.5.2.5. Education Policy in Protected Areas

The parks will be used as a tool towards educating the public and school children. Park management will, through awareness programs, encourage park use by Bhutanese nationals to promote broader support and appreciation for the protected area system, the need for conservation of biological diversity; and on Bhutan's conservation policy and philosophy and to instill an appreciation for Bhutan's natural beauty. (NCS, 1996).

2.5.3 Access to PGR, Benefit Sharing and Realization of Farmers' Rights

In 1969, the Forestry Act was drawn up. In 1995, the act was revised and became the Forest and Nature Conservation Act. The new Act provided a regulatory mechanism for conserving and managing the forests. The National Plant Quarantine Act, 1993 provides legal measures to control the movement of diseases, insects and other pests of economic importance. However, a policy and legal system on regulating conservation and use of biological resources under agricultural systems is yet to be developed. The issuance of government circulars at occasions has so far established

guidelines for regulating PGR processes. The validity of such document is limited and often over-ruled by subsequent releases. A formalized instrument through national ruling will certainly serve the best interest of the country to secure just treatment beyond its boundary.

Access to and transfer of some economically important plant species are subject to restriction, but essentially without the legal arsenal to support contextual application. Sometimes, access to and ultimate use of PGR are conditioned to facilitate the sharing of benefit, but loopholes in the current system give rise to misuse and loss of mutual trust. A national framework/legal policy on PGR is being developed with the help of a consultant. It includes germplasm exchange and access, MTAs, collection protocols etc.

The WTO has established a framework for national policy and legislation pertaining to the trade in PGR and exercise ownership rights while respecting the rights of others. As a part of the global trading community, Bhutan must consider all aspects of PGR such that imposing nonnegotiable demands on its own resources does not restrict access to others' resources. Within this framework, there is ample opportunity to exercise its sovereign right, implement the rights of its indigenous people, and create an amenable environment for outside interests to establish themselves within the country.

The actual work specifically targeting PGR conservation and use is minimal. What has been achieved so far in this direction are mere spin-offs of greater objectives. This is because first, the research program and consequently the scientific and technical capability are weak. Secondly, the development priority in real economy gave little room for agro-biodiversity education, which in turn thwarted effort to promulgate awareness among the planners, policy makers, general public and even within the scientific community itself.

At the government level, the concern for PGR is emerging. The number of nationals being trained in conservation and natural resources management courses are on the rise, with few already been absorbed into conservation programs. In the context of present socio-economic and demographic trends, the need for education and awareness on conservation and utilization of PGR must be addressed urgently.

2.5.4 Environmental Impact Assessment (EIA)

In 1993 NEC published the first environmental impact assessment (EIA) guidelines for Bhutan. Since then NEC in collaboration with line ministries and other interested organizations has worked steadily to improve and institutionalize the EIA process. In September 1996 NEC with assistance from the Asian Development Bank undertook a major revision of the EIA process, which culminated in the release of two draft documents in May 1997.

The first, *"Institutionalizing and Strengthening of the Environmental Assessment Process in Bhutan"* contains sections, which include the following:

1. A revised EIA process for Bhutan, including a proposed legal basis for EIA implementation, an institutional structure for EIA implementation, and an analysis of the training and institutional strengthening requirements to implement RGOB environment policies effectively;

2. A proposed mechanism for environmental permitting, monitoring and enforcement; and

3. Environmental quality objectives and guidelines, which are intended to provide guidance both for evaluating new projects and the performance of existing operations.

A companion document, *"Environmental Assessment Sectoral Guidelines"* has been released. It describes potential environmental problems commonly associated with activities in the following sectors:

- hydropower;

- power transmission lines;
- forestry;
- highways and roads;
- mining and mineral processing; and
- new and existing industries.

Two additional documents have been produced:

- Strategic Environment Assessment Manual
- Ambient/Discharge Standards Process Manual

A section on Strategic Environmental Assessments (SEA) was also included in the second document. It emphasizes the importance of incorporating environmental assessments at an early stage of planning and policy development, rather than at the project level when mitigation options are frequently limited.

There has been a series of developments since that time. These include:

- **EA Act, 2000**

The National Environment Commission Secretariat (NECS) formulated an Environment Assessment Act, 2000 through a series of consultation with all affected stakeholders in the country. This Act was enacted in July 2000 with the primary objective of setting up procedures for the assessment of potential effects of strategic plans, policies, programs and projects on the environment. This Act specifies the Royal Government's policies on measures to avoid or mitigate potential adverse effects on the environment due to developmental activities.

- **EA Regulation**

The National Environment Commission (NEC) issued the Regulation for the Environmental Clearance of Projects in April 2002, defining responsibilities and procedures for the implementation of the EA Act, 2000 concerning the issuance and enforcement of environmental clearance for individual projects. This regulation was adopted by the Commission to ensure the objectives of the EA Act, 2000 are implemented through a uniform process for all projects while issuing their environmental clearances.

- **SEA Regulation**

As mandated by the EA Act, 2000, the National Environment Commission adopted the Regulation on Strategic Environmental Assessment that came into effect in April 2002. The purpose of this regulation is to ensure that environmental concerns are fully taken into account by all governmental agencies while formulating, renewing, modifying or implementing any policy, plan or program, including national Five-Year Developmental Plans. This regulation also ensures that the cumulative and large scale environmental effects are taken into consideration and to promote the design of environmentally sustainable proposals that encourage the use of renewable resources and clean technological practices.

- **Sectoral EA guidelines**

The National Environment Commission Secretariat is in the process of updating the existing Environmental Assessment Sectoral guidelines. These sectoral guidelines are considered living documents and are intended to assist the staff at NECS, affected ministries and agencies and the project proponents, to incorporate environmental protection parameters into the project cycle, particularly at the early planning stage.

In addition to these Environmental Sectoral guidelines, the NECS has developed Environmental Assessment Process Manual to assist the applicant in applying for the environmental clearance.

- **Environmental Codes of Practice (ECOP)**

  To promote sound environmental management for the development activities in the urban areas and also to specify key environmental terms, NECS develops ECOPs, one or more of which may be attached to the environmental clearance issued for a relevant project or activity under the Environmental Assessment Act, 2000.

  The following ECOPs for urban areas, which has been circulated to all relevant agencies and printed, may be be relevant to biodiversity issues:

- ECOP for Solid Waste Management in Urban Areas
- ECOP for Sewage and Sanitation Management for Urban Areas
- ECOP for Urban Roads and Traffic Management for Urban Areas

  In addition, the ECOP for Hazardous Waste Management for Urban Areas is in process.

2.5.5. Strategy and planning relating to Wild Biodiversity – Processes and Results

The RGOB's general strategy for wild biodiversity conservation is as follows:

Give priority to the following areas within the Convention on Biological Diversity:

(1) Conservation and sustainable use of biodiversity through:
- Identifying important components of biodiversity;
- Monitoring activities that pose threats to biodiversity; and
- Where possible establishing protected areas.

(2) Identification and monitoring of Biodiversity through:

- Identifying and monitoring components of biological diversity important for conservation and sustainable use;
- Identifying and monitoring processes and activities having or likely to have significant adverse impacts on the conservation and sustainable use of biodiversity; and
- Maintaining and organizing data derived from identification and monitoring activities.

(3) Support in-situ conservation through:

- Developing guidelines for the selection, establishment and management of protected areas or areas where special measures need to be undertaken to conserve biological diversity;
- Rehabilitating and restoring degraded ecosystems and promoting the recovery of threatened species, inter alia, through implementation of plans or other management strategies.

(4) Support research and training through:

- Establishing scientific and technical education and training for the identification, conservation and sustainable use of biological diversity and its components; and
- Promoting and encouraging research, which contributes to the conservation and sustainable use of biological diversity.

(5) Provision of financial resources to enable Bhutan to meet the agreed full incremental costs through implementing measures, which fulfill the obligation of this convention.

(6) Provision of support to control access to genetic resources through human resource development in the field of environmental legislation. (MOA, 1996)

2.5.6 Strategy and Planning Relating to Domestic Biodiversity-Processes and Results

Specific objectives for the RNR sector are national food security, conservation of natural resources, enhancement of rural income and employment generation. The role of the RGOB in the RNR sector should be one of facilitator, extending the range of available opportunities through constructive regulatory measures, appropriate fiscal policies, provisions of infrastructure, cost-effective research, technical support and advisory services.

Governmental interventions in the RNR sector have been brought within a stronger 'Program Framework' approach. Activities in the sector were grouped under six principal programs:

- Management and planning services;
- Farm system development;
- Crop and livestock production services;
- Forest management services;
- Export horticulture development; and
- Human resources development.

Activities of RNR-RCs with strong relevance to PGR conservation and use

1. **Agriculture**

- Germplasm collection of cereals– rice, maize, wheat, barley, buckwheat, millets
- Germplasm collection of grain legumes – mungbean, soybean, pigeonpea
- Germplasm collection of oilcrops – mustard, groundnut, niger, sesame
- Characterisation and evaluation of collected germplasm
- Rejuvenation and seed maintenance of accessions
- Cross-breeding of local varieties x HYVs
- Selection and variety development
- Introduction and evaluation of exotic germplasm of different crop species and varieties
- Baseline studies and inventories on agro-biodiversity

2. **Horticulture**

- Germplasm collection of native vegetable species and their varieties
- Characterisation and evaluation of collected germplasm
- Production assessment of elite germplasm
- Introduction and assessment of exotic vegetable spp.
- Germplasm collection of native fruits (as seeds and seedlings)
- Use of collected materials in grafting and propagating
- Maintenance of a living collection
- Introduction, evaluation and adaptation of exotic fruit spp
- Collection and other studies on medicinal and aromatic plants

3. **Forestry**

- Baseline surveys on spp distribution, availability and uses
- Collection and propagation of native spp
- Comparative studies of exotic and native spp
- Seed collections of native spp
- Introduction and evaluation of multi-purpose spp
- Inventories and databases – flora and fauna

4. **Livestock**

- Collection and evaluation of native feed and fodder spp

- Field genebanks/live herbaria of pasture/fodder spp
- Introduction and assessment of exotic species
- On-farm testing of various spp
- Comparative performance research
- Assessment of genetic variation of selected spp

2.6. Economic Valuation of Biodiversity

There has been very little attempt to develop an economic valuation of biodiversity in Bhutan. There are some economic data on timber, especially on export and some gross figures on tourism, with estimates of the number of tourists coming for biodiversity reasons. However, economic valuation of biodiversity in particular, and resource or environmental economics in general remains an area where work is badly needed. This is considered a particularly important need in view of the direct reliance of most of the population on biodiversity and its critical importance to the nation as a whole.

Greening National Accounts

The need to start work on greening accounts is clearly spelt out by the Royal Government in following words:

"The greening of our system of national accounts would certainly result in higher GDP estimates than those arrived at through conventional routes. However, this would not be its main value. More importantly, it would help to provide us with quantitative indicators of the importance of the environment to our economy and of the sustainability of our development path. In this sense, the greening of our system of national accounts would contribute to the quantification of Gross National Happiness (GNH)." (Bhutan 2020: A Vision for Peace, Prosperity and Happiness, p 88).

As a result, the Central Statistical Organization approached WWF Bhutan for support to start the process. WWF has given a grant to CSO to commence the process of greening the national accounts. CSO is collecting necessary information from concerned organizations. The main advantage of green accounting is that the detailed information used to produce the accounts hi-lights policy choices, which further both environment protection and economic growth, creating 'win-win' results.

2.7. Integration of Biodiversity Considerations into other sectors

Biodiversity is impacted by virtually all sectors of the RGOB, but there has been relatively little integration of biodiversity conservation into these sectors other than those of the MOA. The new Strategic Environment Assessment (SEA) process is intended to assure that all government plans, policies and programs shall incorporate environment considerations, including biodiversity.

As an example of the need for integration, the primary RGOB responsibility for forest industry development is assigned to the MTI. The MOA/FSD mandate in forest industries is limited to assuring the sustainable production of raw materials on which rational industrial development can be planned. The department therefore, implements those aspects of forestry development related to harvesting and supply of timber and other forest products on a sustainable basis.

Some of the issues are:

- Development of favorable circumstance, and business and institutional environment for the wood industry, including ensuring availability of raw materials on a sustainable basis, and
- Development of appropriate home and cottage industries to add value to basic forest products in order to support local community based economies and improve rural livelihoods.

a. Land use planning

In the past opportunities to improve land use allocations and resource use intensity for maximum sustained yield were largely ignored. This has perhaps not been too serious a problem in the past due to the low population and largely subsistence economy. However, the marked changes now occurring in demography and economy make land use planning an essential requisite for sound and sustained development. To guide the RNR Sectoral development, land use planning has been considered essential for some time now, as a means by which an effective synthesis of available land resources and optimum land utilization can be achieved. Land use planning is taken here at different scales and degree of detail as required, present land utilization in terms of different economic functions, and evaluation of land productivity and capability and land classification at different scales and for different purposes including soil and water conservation. The LUPP of the MOA is responsible for co-ordinating land use and planning activities within the MOA.

The primary objective is to promote appropriate land use through adequate land evaluation for multiple use of forest resources. The program also assists in developing a system of related activities of forestry use, nature conservation, management of critical watersheds, as well as in developing guidelines for area management to achieve specific land use objectives.

b. Hydropower

Hydropower electricity generation in Bhutan is increasingly becoming synonymous to economic development because of it's immediate impact on the country's balance of payment and down stream development activities. This is the largest contributor to the country's exchequer. However, these figures can change drastically if the catchments of the hydroelectric dams are not protected. Implementation of proper watershed management plans including biological diversity conservation programmes can contribute to the sustainability of this very important source of income for the country.

Maintenance of forest covered catchment areas is required to keep them in such shape that the hydroelectric production is not harmed due to siltation resulting from erosion upstream. In economic terms an even more important requirement is the maintenance of the regulatory capacity of the watersheds in such a way that the run-off characteristics of the rivers originating in these areas are not harmed by making them more flood prone and less reserving for the dry season.

c. Traditional Medicine and the Institute of Traditional Medicine Services (ITMS)

Traditional medicine is still practiced throughout Bhutan, using more than 300 species of medicinal plants. The ITMS is an organized institute staffed with traditional and western-trained doctors. The Institute regularly collects plants to produce medicine as per formulae cited in ancient medical scriptures. The ITMS combines traditional medicine with acupuncture to treat all types of diseases.

Medicinal plants are vulnerable to overexploitation. For example, it is known that in the olden days at least two plants, ruta (*Saussurea lappa*) and manu (*Innula helenium*), were cultivated and marketed in the Bumthang valley. Today many people do not even remember what these plants look like. A remnant of manu however, has been found and is being cultivated by at least one family (FAO.1996). Recognising this, the ITMS has a program for research on, and propagation of medicinal plants.

Upon request by ITMS to collect medicinal plants, the FSD issues permits on a case by case basis. The location for collection and quantity to be collected are to be specified in the permits. But often the collection of the permitted quantity is not possible, as the required species is not available in adequate volumes. ITMS shows samples of the medicinal plants to local laborers, who are then requested to collect and bring in the required quantity of each species. The collectors are paid on a daily basis, or sometimes contracted under lump-sum agreements. It is virtually impossible, however for the scant core of technicians to reach every collection area for screening. In most cases meeting the collection target is more important for the collectors than is scientific harvesting on a sustainable basis. Lacking technical directives and proper guidelines, this is to be expected.

This is the probable reason why some species have decreased by almost 50% over the past 20-25 years in localities, where they once grew abundantly.

Generally alpine plants flower in August, which coincides with the ITMS team's collection schedule for herbal plants. At this time, even the fruits from the earlier flowering plants are not yet ripe or mature enough for their seeds to be shed. For many herbs, the whole plants are collected, including both flowers and fruit. This method of collection reduces the chances for regeneration and hence threatens the very existence of some species. If such methods continue, some species may become extinct (FAO.1996).

d. National Eco-Tourism Strategy

The Department of Tourism has drafted the Bhutan National Ecotourism Strategy with financial assistance from WWF Bhutan. The process of developing the Strategy has involved wide participation by the tourism industry, including two major stakeholder and industry workshops in April and September 2001.

The term "ecotourism" is now widely used in both conservation and tourism circles, although definitions vary widely. Taking a broad definition, all of Bhutan's tourism can be said to be ecotourism. Therefore, rather than plan for ecotourism in a separate way, the Strategy addresses the whole of the tourism sector and seeks to incorporate the principles of ecotourism where appropriate. Furthermore, the Strategy uses the language of ecotourism as means to explain, in a positive way, Bhutan's unique approach to tourism.

The Strategy generally reaffirms Bhutan's overall tourism policies. The Royal Government of Bhutan (RGOB) will continue to actively intervene in quality, pricing and payments. A new slogan "high value, low impact" will be adopted to more clearly explain Bhutan's determinedly cautious "product-led" and "values-led" approach to tourism development. Ecotourism, defined the Bhutanese way, will be an ideal towards which the whole tourism industry will strive. In keeping with this approach, a set of ecotourism related principles is established to guide the future development of the tourism sector.

e. Agro-Tourism:

As Bhutan's agricultural system is still largely intact in its traditional form and mainly based in the rural settings, there is a potential for enhancing tourism with a purpose in the natural countryside of Bhutan. Tourists can be educated and presented with the traditional agricultural techniques and practices, organic farming and farm products and the diversity of crops sustaining the rural based communities.

2.8. Bhutan Integrated Biodiversity Information System (BIBIS)

Many of the Country's biological resources are insufficiently and/or poorly documented relative to what should be known about them for optimal conservation, access and use. Documentation of wild relatives of crops and on-farm genetic resources located in situ is particularly poor. Derived information on where materials have been distributed, pertinent ethno-botanical information, farmer and indigenous knowledge have not been maintained on material conserved in the herbarium and the seed stores. This situation is exacerbated due to the fact that at the national and institutional level, data management and documentation activities are given an inappropriately low priority in the allocation of funding. There is no standard procedure and systematic data-recording format corroborated by the agencies and institutes concerned with biodiversity issues. In the proper format, data can be used not only to assist conservation efforts, but also to "add value" to plant genetic resources for food and agriculture.

With the financial support of the World Wildlife Fund (WWF) Bhutan Program, the NBC along with various partners involved in biodiversity conservation and sustainable use have developed a 5 year project proposal to integrated the nations biodiversity related information, including PGRFA information, into one web-based system called the Bhutan Integrated Biodiversity Information System (BIBIS). The project proposal has been submitted to the government in January 2002 for the possibilities of securing funds. By the end of the 9th FYP, BIBIS should be a well-known and highly accessible source of biodiversity information for use to biodiversity stakeholders in Bhutan and beyond. It should become a natural reference point for dissemination of biodiversity information for use by policy makers and planners for the conservation, management and the sustainable utilization of the biological resources in the nation.

Concept of the BIBIS:

Currently there is no easy way for users to know what biodiversity information exists or how to get to it. When one considers the nation-wide variety of locations where biodiversity information is being collected and stored, the need for RGOB to establish a Bhutan Integrated Biodiversity Information System (BIBIS) is compelling.

The idea of BIBIS is simple: a focal point where the many parties that generate, manage, or use data on biological resources can collaborate and make decisions leading to broader access to that information. BIBIS will point users to sources for the data they seek, while working with funding agencies to encourage development of tools and strategies to make data more accessible. BIBIS will not duplicate existing databases or information, but will provide directory services for the large array of available information. It will also identify gaps where new databases are needed, and help development, transfer, and application of new technologies. Further, BIBIS could co-ordinate access to data outside the usual realm of the biological sciences.

BIBIS's mission will be to provide leadership and a neutral venue to facilitate collaborative discussions about the availability of biodiversity data and information. It will also be a clearing house to provide knowledge of, enable access to, and facilitate the use and exchange of biodiversity data and information. BIBISs' objectives will be to promote and encourage the use of well documented biodiversity data and information; address the full scope of biodiversity from molecular data through ecosystems; connect those seeking information and data on biodiversity to those having data custody; and facilitate structured identification of and access to data pertinent to a user's needs. This will be accomplished through an interactive computer system that uses metadata (data about the data) information on geographic location, species, ecosystem, or other keywords to sort, aggregate, and/or integrate data sets, identify gaps in existing data and knowledge and provide a forum for collaborative approaches to biodiversity information issues.

BIBIS must be responsive to user needs, providing both data and information services tailored for different audiences. BIBIS must also be responsive to the needs of providers, and must offer incentives and encouragement for them to offer their data on the BIBIS system. It will facilitate development of metadata standards (minimum criteria for data documentation and format) and the establishment and provision of data collection and reporting protocol. Guidance on appropriate uses of data or information will also be provided. BIBIS will facilitate the improvement of data set quality with a feedback system that allows comments on data quality and utility. Data custody will reside largely with primary data collectors and producers, and users will be referred to original data sources. Therefore, data holdings by BIBIS will be reduced. BIBIS will use appropriate information integration and analysis technologies and promote the adoption and use of appropriate information standards.

BIBIS will have a distributed structure that will function based on a consensus-building and partnership approach. BIBIS will serve as a convenor, facilitator and host. BIBIS experts will move discussions along and involve key constituencies. An Advisory or Governing Board from the broad community of contributors and users will provide general direction. BIBIS must establish partnerships with the other organizations, whose activities include data and information collection and assessment of biodiversity issues.

BIBIS' location will be within the NBC The aim is to provide strong computational and information management services support; a creative and active program in biological sciences, especially involving the use of computers in biodiversity information management; broad-based expertise or strong links to systematic ecological research, and collections, information management, understanding of modern and historical Bhutanese collections, reasonable access to national and international transportation; and comfortable, modern facilities for conferences and BIBIS staff.

2.9. Education and Public Awareness

During the 6th five-year plan the RGOB accorded further recognition to the role of communities in forestry development. In order to support and facilitate the participatory forestry development the government drew up and adopted a set of social forestry rules. These cover model concepts in participatory development and utilization, including private forestry, community forestry and lease forests.

Initial efforts led to the establishment of June 2nd as a 'Social Forestry Day' held annually involving the planting of trees around households and public institutions such as community schools. However, the greatest success has been planting at schools. Initially social forestry schemes sought to encourage community participation as a primary means for Afforestation of degraded lands in the vicinity of rural villages. The community forestry programs aim to motivate and educate user groups to build confidence for improved management of forest resources.

Some of the activities of this program are identification of user groups; motivation and education including organization of field training on tree planting for communities; organization of public meetings regarding participatory forestry and study of problems of communities; and participation in discussions about policy guidelines and rules related to social forestry. A more holistic participatory program involving farmers, researchers, and extension personnel combining conservation/protection (in-situ and ex-situ) aspects with development/management aspects (introductions, selection, improvement, breeding, multiplication, cultivation etc.) will be the key programs in the implementation of the Biodiversity Action Plan.

Funded by WWF, NEC is coordinating in drafting a National Environmental Education Strategy for the national environmental education in the country. NEC has formed a core group comprising of key stakeholders to lead in drafting the strategy. The main objective is to streamline EE activities of different stakeholders to mitigate duplication of efforts, and more importantly to have positive impact on the environment conservation.

a. The Royal Society for the Protection of Nature (RSPN)

The Royal Society for the Protection of Nature, an NGO has been the most active organisation with regard to improving public awareness and education. In the last 9 years, the RSPN has established a network of school nature clubs, and several research projects including some on fuelwood consumption, water quality, eco-tourism as well as workshops on environmental issues for village headmen and representatives of the National Assembly. It also addresses a wide variety of conservation issues, using a variety of educational methods such as public meetings, magazines, debates, seminars and workshops.

RSPN, since its establishment in 1987, has Environment Education and Awareness as a major component of the organization's program activities. With the assistance of WWF Bhutan Program, RSPN has implemented conservation education and awareness activities throughout the country. These activities were mainly implemented as co-curricular activities in schools. With 78 established till date, nature clubs serve as the target group as well as the medium for dissemination of conservation to others. These nature clubs are coordinated by mostly by teachers who have attended workshop or training programs conducted by RSPN. The members of the nature clubs, who act at their own local levels, have conducted awareness campaigns, exhibitions, shows and planted trees.

RSPN and NCD have also initiated collaborative efforts in the implementation environmental education in the national parks. Environmental education programs were conducted collaboratively in Royal Manas, Black Mountains and Thrumshingla national parks.

b. The Bhutan Forestry Institute (BFI) and the Natural Resources Training Institute (NRTI)

The curriculum of the BFI under DoFS has been revised to include wildlife management, protected area management and biodiversity conservation. Every year the BFI trains forest guards who are recruited by the various Divisions/Sections of the DoFS.

The NRTI provides three years training in the fields of Animal science, Agriculture and Forestry. Refresher courses for in-service RNR staff are also conducted on a yearly basis.

c. World Wildlife Fund Bhutan (WWF)

The communications unit in the WWF Bhutan program office was set up in 1994 with a communications officer to help prepare a variety of publications and materials to support WWF Bhutan program activities, to correspond with the WWF network and to maintain contacts with local media.

Communications activities of the Bhutan program office have succeeded in promoting its work through strategic alliances with local media. The Bhutan program has produced videos and audiocassettes, organized quiz contests, supported discussion forums and developed a website. WWF has worked to enhance understanding and awareness of the environmental issues and WWF activities in the kingdom through programs such as the BBS produced GOWA discussion forums, joint environmental campaigns with the City Corporation of Thimphu and quiz contests and painting and poetry competitions organized for local schools. Regular press releases are sent to BBS and Kuensel (the national newspaper) to inform them of WWF workshops and other activities.

WWF is working to build partnerships with other organizations such as the Royal Society for the Protection of Nature and Information and Communications Services of the Ministry of Agriculture to efficiently and effectively reach a wider audience. The WWF Bhutan supports nature clubs in schools with the annual budget, through RSPN.

2.10. International Cooperation in Biodiversity Conservation

2.10.1 International Agreements and Programs

The Royal government of Bhutan recognizes the importance of co-operating with nations at the international flora to bring about biodiversity conservation and sustainable use. In keeping with this policy of the royal government, Bhutan signed the Convention on Biological Diversity at the United Nations Conference on Environment and Development, "Earth Summit".

In signing the convention on Biological diversity in Rio De Janeiro in 1992 and the ratification of this convention by the national assembly at the 73rd assembly Bhutan has accepted its global commitment to preserve the country's wealth of Biodiversity. Bhutan also recognizes the importance of the part of the convention, which assigns sovereign countries rights to genetic resources. Bhutan has also signed the Framework Convention on Climate Change at the Earth Summit, and the National Assembly ratified the convention in 1995.

Bhutan is also part of the cooperation agreement under the Sustainable Development Agreement (SDA) with Benin, Costa Rica and the Netherlands, based on the principles of equality, reciprocity and participation. One of the priority areas of cooperation identified between the countries is the conservation and sustainable use of biodiversity.

2.10.2 Multilateral and Bilateral Cooperation on Biodiversity

Biodiversity is an important area for development co-operation between Bhutan and both multilateral and bilateral donors. A few of the projects focused on or relating closely to biodiversity are:

- Biodiversity Strategy and Action Plan (UNDP and GEF);
- Conservation and Community Strengthening through Small Grants Programme, GEF/UNDP;
- A series of environmentally related projects of the UNDP;
- Sustainable Development Co-operation between the Netherlands and Bhutan, where biodiversity has been considered one of the priority areas for co-operation;
- Assistance to NEC (DANIDA);
- Assistance to NITM (EU);
- Assistance to NEC with the EIA process (ADB);
- Integrated Forest Management Projects with Austria, Germany, FAO, the World Bank, Switzerland-Helvetas and others;
- Biodiversity conservation in Jigme Singye Wangchuck National Park with the Netherlands-SNV;
- Forest Resources Management and Institutional Development project (UNDP)
- Assistance in the Integrated Horticulture Master plan (UNDP)
- Assistance in the Integrated Horticulture Development Program (UNDP)
- Punakha -Wangdi Valley development project (UNDP)
- Integrated warm water fisheries project (UNDP)
- Technical Assistance Program to the First Eastern Zone Agricultural Project (UNDP)
- Assistance to essential oil development project (UNDP)
- Tourism development (Austria)
- Assistance to the LUPP (DANIDA)
- Assistance to the ITMS (European Community)
- Development of a National Re-afforestation strategy (FAO & Japanese Government)
- Food processing (natural resources use) (Switzerland-Helvetas)
- Manufacture of energy-efficient wood stoves (Switzerland -Helvetas)
- Assistance to NRTI (Switzerland -Helvetas)
- Assistance to the Irrigation section of MOA (Netherlands- SNV and Save the Children- USA)
- Agro-biodiversity Conservation (ABC) Project (Netherlands)
- Assistance to the National Herbarium and the Flora of Bhutan (DANIDA)
- Assistance to the Agro-biodiversity Project and the genebank (CGN/ IPGRI)
- Assistance to on farm conservation of rice ad maize (SEARICE/ NORAD)
- Assistance to an integrated biodiversity information system (WWF)

The Bhutan Trust Fund for Environemntal Conservation

Bhutan Trust Fund was established in 1991 as the world's first environmental trust fund, and legally incorporated in Bhutan under the Royal Charter in 1996. It is an independent grant-making organization created to sustain financing for Bhutan's conservation programmes. Donors to the trust fund endowment include the Global Environment Facility, World Wildlife Fund and the governments of Bhutan, Denmark, Finland, Netherlands, Norway and Switzerland. Today, the trust fund is governed by a high level board composed of Bhutanese representatives from the government's agriculture, environment, education and finance sectors, and the private sector and civil society.

Using annual income from an endowment of about $ 30 million invested in domestic and international capital markets, the trust fund awards grants annually to eligible institutions and individuals through a set of strategic five year funding objectives focusing on supporting in-situ and ex-situ conservation and sustainable ultilisation initiatives, strengthening integrated conservation and development planning, and promoting conservation education and public awareness. By charter, the trust fund is mandated to support the following broad themes:

- Training professionals in ecology, natural resources management, forestry and environment
- Assess biological resources and develop ecological information base
- Develop management plans for protected areas and implement them
- Public awareness and environmental education in the schools
- Institutional support to related sectors/agencies and
- Projects integrating conservation and development

Given below is the list of major grants financed by theTrust Fund since its inception:

1. Development of Jigme Dorji National Park
2. Development of Royal Manas National Park
3. Electric Cookers as an alternative to firewood (Royal Bhutan Police)
4. Endowment Fund, Royal Society for Protection of Nature (RSPN)
5. Environmental Education at lower primary level, Department of Education
6. Environmental Monitoring of Forest Management Units, DOFS
7. Environmental research and building capacity for NRM at Sherubtse College
8. Human resources development at the National Environment Commission
9. Human resources development for biodiversity conservation (RGOB)
10. Incremental staffing and recurrent costs of conservation (RGOB)
11. Institutional Support to Nature Conservation Division, DOFS
12. Integrated Conservation and Development Project in JDNP
13. Researching and mitigating the effects of cattle migration (MOA)
14. Strengthening forest fire management, DOFS
15. Support for Phibsoo Wildlife Sanctuary
16. Support to Bomdeling Wildlife Sanctuary
17. Support to Royal Botanic Garden, Serbithang
18. Support to RSPN

International Co-operation in the Conservation of Genetic Diversity

International co-operation in the conservation of genetic diversity at the policy level is structured through the FAO International Commission on Plant Genetic Resources (ICPGR) and the FAO International Undertaking. Until so far, Bhutan chose not to participate in the FAO-Commission, but to participate in the regional and global forums and activities thereof.

On the operational level the International Plant Genetic Resources Institute (IPGRI), part of the Consultative Group on International Agricultural Research (CGIAR), co-ordinates a network of Plant Genetic Resources Programs with the International Agricultural Research Centers (IARCs).

The Convention on Biological Diversity supersedes the FAO Undertaking and as such is binding. In the Convention, national sovereignty over biodiversity is explicitly recognized. During the UNCED in Rio de Janeiro, Bhutan signed the Convention on Biological Diversity. The 73rd session of the National Assembly ratified the Convention and by that the commitment of the Royal Government of Bhutan to conserve its biodiversity was further strengthened.

An Agro-Biodiversity Project is being implemented within the framework of the Sustainable Development Agreement between Bhutan and The Netherlands. The CGN center In the Netherlands and SEARICE (NGO) from the Philippines assist the agro-biodiversity project by providing technical assistance and relevant training in the field. Consequently the principles of sustainable development: reciprocity, equality and participation are built into the project. Relevant agreements reached between Bhutan and the Netherlands in the context of SDA is also taken into account. Given the objective and scope, this project should be integrated as one of the themes upon which the biodiversity strategy and action plan will expand.

At the regional level, the South Asia regional office of IPGRI has supported the national capacity development through numerous short-term training on PGR research and development. However, the benefit from these training was not realized without the institutional and policy support for a national PGR program. The officials from MOA continue to participate in the regional workshops, seminars and meetings conducted by the South Asia Regional Network for PGR management.

The MOA has a good relationship with the NBPGR in New Delhi, which has provided technical assistance in germplasm collecting and seed storage management. Apart from the PGR newsletters, which are regularly distributed to individual agriculture researchers and research stations, certain publications and periodicals are also provided free of cost. The Government of India supported a survey of forest resources in Bhutan during 1974-1980. It is still the most comprehensive forest inventory covering 29,176 km^2 or 72% of the total land area, excluding the permafrost in the north. Some 78 tree species were inventoried and the data mapped at 1:50,000 scale (Pradhan, 1996).

2.10.3 Biodiversity Cooperation with International NGOs

World Wildlife Fund (WWF) - Bhutan Program is the principal international NGO, which has assisted Bhutan with biodiversity for many years. WWF has provided important support for biodiversity conservation since 1977, including training programs and other efforts to expand staff capabilities, surveys and inventories of biodiversity, assistance to national park development, and institutional support to the Nature Conservation Division and RSPN. For the future, WWF has adopted a program approach and shall focus on the following programs:

- Support on-going improvement in policy development and implementation to conserve forest & freshwater ecosystems;
- Promote alternative, environmentally sustainable rural livelihoods to reduce pressure on natural resources;
- Promote environmental education and awareness;
- Conserve species of special concern including plants and birds.

Currently the major activities of WWF are Thrumshingla National Park (TNP), Royal Manas National Park (RMNP), Biological Corridors, Bhutan Integrated Biodiversity Information System (BIBIS), Tiger Conservation Program, Anti-Poaching, and Taxidermy, Survey & GIS, Medicinal and Aromatic Plants (MAP), Environmental Education, PICO hydel, Electric cookers at Institute of Language and Cultural Studies and RBP dekha messes, Ecotourism, Institutional Support to Nature Conservation Division and Royal Society for the Protection of Nature. Most of these activities will be continued in the next five years.

Other international NGOs have had a much more limited involvement with biodiversity in Bhutan.The World Resources Institute (WRI) of Washington D.C. has provided personnel to assist with development of Bhutan's National Environmental Strategy and with a study of biodiversity policy options (Reid, 1996). The Snow Leopard Trust has assisted WWF with training in field survey techniques. The World Foundation for Environment and Development (WFED) of Washington D.C. is assisting the NBC to develop a Bioprospecting Action Plan for Bhutan and facilitating a program of workshops and training in aspects of bioprospecting management.

Chapter 3

Direct Conservation Actions

3.1 Wild Biodiversity

3.1.1 In-situ Conservation Efforts

3.1.1.1 Protected Area System

In general the park policy puts highest emphasis on protecting the ecological integrity of its ecosystems and ensuring that locals legally settled within the park boundary prior to its establishment are entitled to remain within the park. It also encourages the practice of traditional culture and customs as well as sustainable use of natural resources.

a). Long term Objectives of Protected Areas

- To protect a large, contiguous natural area containing the range of ecosystems in each protected area in a way that will allow natural processes of succession and evolution to continue with only minimal human influence. Minimal management interventions will target the protection of valuable biodiversity and important river catchments, but only if and when necessary;

- To maintain the current diversity of habitats in the protected areas so that the full range of biodiversity can be maintained. In the event of local extinction's, reintroduction's may be undertaken but no exotic species will be introduced;

- To provide specific protection to endemic and endangered species contained in the protected areas;

- To provide suitable, tested management to increase the viability of specific endemic and endangered species provided such management is confined to small areas not exceeding 5% of the park area; and

- To encourage the undertaking of biological research that will improve management, and on the evolution and ecological features of the ecosystem, provided these activities do not damage the environment or threaten endangered species.

b). Intermediate Objectives:

- To develop guidelines for the selection, establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity;

- To formulate and implement management plans for the protected areas in order of priority.

- To review what is known about the nation's ecosystems and species to determine whether there are additional areas, which should be protected, and to initiate action to establish these additional areas.

c). Actions:

- Prepare guidelines for the preparation of management plans for protected areas to ensure that the plan incorporates management necessary to meet the objectives of the protected area system.