

### National Biological Resources (Biodiversity) Policy and Strategic Plan of Action

"For a sustainable and wise use for a more prosperous living of the people of Brunei Darussalam while respecting the limits of nature and natural resources, and the integrity of God's creation."

BIODIVERSITY RESEARCH AND INNOVATION CENTRE MINISTRY OF INDUSTRY AND PRIMARY RESOURCES BRUNEI DARUSSALAM



#### **Role of Biodiversity and Its Components**

- The sustainable development and wise use of biodiversity resources and its components are vital. These will meet the crucial and continuous needs of the growing population of the country for food, healthy living conditions and good health.
- ii. An intrinsic, complex and biodiverse ecosystem has a high ecological value that provides a bank of genetic resources, derivatives, and habitats for highly diverse flora and fauna species. These are of economic, educational, scientific and environmental value, as well as having cultural, recreational and aesthetic value as attractions for nature and ecotourism activities.
- iii. High biodiversity areas provide sites for the continuous evolution and lifesustaining systems of the earth.

#### VISION

Excellence in Biological Resource (Biodiversity) Management Strategy for a better quality of life of people of Brunei Darussalam

#### **MISSION**

- To discover and manage the vast natural biodiversity of Brunei Darussalam through Conservation, Research & Development, Promotion and Commercialization that will accelerate national economic diversification.
- To promote an effective biodiversity protection & conservation program through an integral holistic approach, establishment of network of protected areas & other sustainable terrestrial and aquatic uses.

#### **STRATEGIC OBJECTIVES**

- Promote and implement the nation's biodiversity management strategies of multisectoral implications and objectives ensuring sustained social, economic and ecological benefits;
- Encourage green and well-balanced multi-sectoral development through a wise and wide scope of biological resource utilization. Comprising of protection of the natural and healthy ecosystem services for socio-economic and sound environmental benefits;
- As the National Focal Point (NFP) of the related international conventions such as CBD, RAMSAR, International Wetland, ASEAN Centre for Biodiversity (ACB) and CITES establish R & D networks and cooperation that can give an impact to the national economic growth and development;

 Support all initiatives that can increase the awareness of all levels of society in the country on the importance of ecological and biodiversity and improve their knowledge, understanding and experience.

#### GENERAL POLICY STATEMENT

The Government of Brunei Darussalam will continue to commit itself to protect, conserve, develop and wisely manage its biodiversity including ecological processes, genetic and habitat diversity for the promotion of social, economic and well-being of the people in line with the national and global development agenda.

#### **SPECIFIC POLICY STRATEGIES**

#### 1.0 UNIQUE HABITATS

- 1.1 Request for long term initiatives to ensure the sustainable and wise use of land, forest and marine resources and balance management objectives and priorities by the authorities concerned to maintain the biological and ecological values.
- 1.2 Request for adequate and permanent reserved forest and marine areas categorized as protected sites for wild flora and fauna protection and conservation in the country and the agencies concerned having adequate legal provisions and administrative and technical regulatory procedures.
- 1.3 Promote a systematic management of sites of high biodiversity value including areas for commercial harvesting of related resources within the concept of

sustainable harvesting, environmental conservation and sustained socioeconomic multiple-use. Protect these sites from all forms of destructive practices that degrade or deplete ecosystems and habitats.

#### 2.0 ECOSYSTEMS AND ENVIRONMENT STABILITY

- 2.1 Support and promote continuous protection and conservation programs nation-wide involving relevant stakeholders and people of all ages to maintain and meet the ecological needs and aspirations of all generations.
- 2.2 Wisely plan and manage the biological and genetic resources to sustain the environment and ecological processes in all ecosystems.
- 2.3 Promote the existing protection of conservation sites developed as recreational areas and parks throughout the country, highlighting the ecological value for the purpose of nature and ecotourism to meet scientific and educational biodiversity programs.
- 2.4 Promote the sustainable practices of all commercial developments involving natural resources to therefore minimize their impact on healthy ecosystems and environmental quality.
- 2.5 Promote programs to rehabilitate degraded ecosystems in the country to stabilize the ecological recovery processes and prevent further deterioration that would result in genetic erosion.
- 2.6 Continue to foster awareness and appreciation of the natural ecosystems, and encourage all stakeholders to become involved with and actively participate in the related initiatives.

#### Range of Ecosystems and Roles:-

<b>Ecosystem Types</b>	Goods Provided	Services Provided
Mangrove Forest	Fish and other marine wildlife/organisms Food Fodder Tannins, Firewood and charcoal Poles and traditional construction materials such as "atap" Genetic resources Herbs and medicinal plants Oxygen gas	Bank protection and flood barrier Wildlife (marine and terrestrial) habitat Maintain biodiversity Fishing site Contribute aesthetic beauty and provide recreation Gene bank Carbon and Oxygen balance Remove water and air pollutants Nutrients cycle
Beach Forest	Wildlife/organisms Food Fodder Firewood Sand Herbs and medicinal plants Oxygen gas	Sea salt and wind barrier Wildlife habitat Contribute aesthetic beauty and provide recreation Maintain biodiversity Gene bank Carbon and Oxygen balance Remove air pollutants Nutrient cycle / improve soil fertility
Montane	Wildlife/organisms Food Fodder Freshwater Genetic resources Herbs and medicinal plants Genetic resources Oxygen gas	Wildlife habitat Wind barrier Contribute aesthetic beauty and provide recreation Maintain biodiversity Gene bank Carbon and Oxygen balance Remove air pollutants Nutrients cycle
Mixed Dipterocarp Forest	Wildlife/organisms Timber, Resin/oil, camphor Food Fodder Freshwater Genetic resources Herbs and medicinal plants Genetic resources Oxygen gas	Wildlife habitat Contribute aesthetic beauty and provide recreation Maintain biodiversity Gene bank Carbon and Oxygen balance Remove air pollutants Nutrients cycle
Peat Swamp Forest	Wildlife/organisms Timber Food, Fodder Freshwater	Seawater barrier Wildlife habitat Contribute aesthetic beauty and provide recreation Maintain biodiversity

	Genetic resources	Gene bank
		Peat
	Herbs and medicinal plants	1
	Genetic resources	Carbon and Oxygen balance
	Oxygen gas	Remove air and water pollutants
	Latex/gum	Nutrients cycle
Freshwater forest	Fish and freshwater (aquatic)	Wildlife habitat
Wetlands	Wildlife/organisms	Contribute aesthetic beauty and provide
	Timber	recreation
	Food,	Maintain biodiversity
	Freshwater	Gene bank
	Genetic resources	Water route
	Herbs and medicinal plants	Reduce and regulate floods
	Oxygen gas	Carbon and Oxygen balance
	onygen gas	Remove air and water pollutants
		Nutrients cycle
Heath Forest	Wildlife /organisms	Wildlife habitat
meani roiest	Wildlife/organisms Food	Contribute aesthetic beauty and provide
		, i
	Firewood	recreation
	Sand	Maintain biodiversity
	Herbs and medicinal plants	Gene bank
	Timber	Remove air pollutants
	Genetic resources	Nutrients cycle / improve soil fertility
Agro ecosystems	Food crops	Maintain limited watershed functions
	Additional food items (e.g.	(infiltration, flow control, partial soil
	terrace fields, fisheries)	protection)
	Crop genetic resources crops	Provide habitat for birds, pollinators, soil
		organisms important to agriculture
		Build soil organic matter
		Bind atmospheric carbon
		Provide employment
Secondary forest	Food,	Wildlife habitat
Secondary forest	Freshwater	Contribute aesthetic beauty and provide
	Firewood	recreation
	Timber	Maintain biodiversity
	Genetic resources	Gene bank
	Herbs and medicinal plants	Carbon and Oxygen balance
	Wildlife /organisms	Remove air pollutants
		Nutrients cycle

Urban Forest	Timber Firewood Food Fodder Freshwater Wildlife /organisms Genetic resources Herbs and medicinal plants Oxygen gas	Lessen or prevent the impact of flooding Dilute and carry away wastes Cycle nutrients Maintain biodiversity Provide ecological corridor and wildlife habitats Contribute aesthetic beauty and provide recreation
Coastal and Marine Ecosystems (coral reefs)	Fish and shellfish Sea weeds (for food and industrial use) Salt Genetic resources	Maintain biodiversity Carbon and Oxygen balance Remove sea pollutants/particles Nutrients cycle Fishing areas Contribute aesthetic beauty and provide recreation

#### 3.0 INDUSTRIAL APPLICATION

- 3.1 Evaluate the long term social, economic, and environmental impact of commercial management of the country's rich biodiversity in order that the best economically feasible and ecologically tenable management option may be identified and pursued.
- 3.2 Continue to identify the economic potential, and improve technologies and practices to optimize the production capacity through collaborative Research and Development activities.
- 3.3 Introduce technical regulatory measures on sustainability and wise use of resources, based on national biodiversity or relevant laws and apply practices that technically, environmentally, and socio-economically use sound resource strategies.
- 3.4 Provide Research and Development information and appropriate technologies to support production and marketing strategies.

3.5 Encourage foreign and local private investments in biotechnology, bioprospecting activities and similar ventures which are in the national interest, particularly in premium value-added, diversified, and integrated industries.

#### 4.0 INTERNATIONAL AGENDA

- 4.1 Develop Brunei Darussalam into a mega diverse nation and regional centre of biological diversity to acquire a notable reputation for world class biodiversity, conservation, management, research, ecotourism and education.
- 4.2 Continue to explore and apply cutting edge and appropriate technologies for sustainable and wise use of the nation's biodiversity covering a broader spectrum of emerging opportunities.
- 4.3 Foster and support multi-lateral cooperation and agreements to be consistent with the international agenda of biological resource development and conservation such as the Convention on Biological Diversity (CBD) agenda. In particular to reduce the global loss of biodiversity, gain access to benefit sharing and protect indigenous rights and knowledge.

#### SPECIFIC STRATEGIC PLAN OF ACTIONS

## 1. Biological Diversity (Terrestrial & Aquatic Biodiversity) Resource Planning & Management

 To investigate, monitor and assess the full range of biological diversity, population and distribution within the Brunei Heart of Borneo area, and forests and marine ecosystems nationwide;

- To establish a biodiversity database on different forests, ecosystem types and marine ecology of Brunei Darussalam to complement the existing or available databases in the country;
- To provide information to relevant agencies for better protection, conservation and sustainable development of biodiversity to support the national economic diversification activities;
- To incorporate biodiversity conservation and protection, and ecologically sound planning processes into all development activities and practices recognizing the limits of natural resources;
- To enhance and sustain the biological distribution and populations of species through species enrichment, propagation or transplanting techniques.
- To apply adaptive management and ecological strategies to aid the recovery
  process for certain species in order to reach optimum species population within
  the specific ecosystem(s).

#### 2.0 Protection and Management of Brunei HoB area and Other Reserved Areas

- To document, map and legalize the boundary of designated Brunei HoB area (58% of the total land) and other protected areas of high biodiversity value such as reserved forests and marine protected area (MPA);
- To maintain forest connectivity and ecological corridors within the designated
   HoB through reforestation of degraded areas;
- To provide comprehensive and scientific protection and management information to relevant agencies on the conservation roles of selected forest or marine sites prior to other sectoral development projects and activities;

- To provide scientific information for the improved protection of selected sites of special biological and geological (landscape and seascape) interest;
- To provide information and scientific references for the periodical improvement, amendment and revision of existing laws and regulations as well as boundaries of protected areas.

#### 3.0 Sustainable Natural Resources Management

- To provide comprehensive guiding principles on the management and protection of natural resources inside and outside the HoB area.
- To provide consultation and technical advice to the sectors concerned to
  address the biodiversity conservation agenda in their respective management
  plans to ensure the sustainable utilization of natural resources within the HoB
  boundary and protected or areas of high potential;
- To establish tripartite trans-boundary cooperation to address issues of management of natural resources in the border areas

#### 4.0 Brunei HoB national communication strategy & Outreach program

- To provide development and research opportunities for postgraduate students and government officials in the field of biodiversity conservation and management;
- To increase and sustain all communities' support for the government's initiatives as to enhance the effectiveness of such programs and collective biodiversity governance;
- To institutionalize biodiversity and environmental education at all levels of education;
- To establish the Brunei HoB Biodiversity field course.

#### 5.0 Development of Nature and Ecotourism

- To promote appreciation of the rich biodiversity and biological resources of sites in the country to aid the economic diversification of the country through enhanced nature and ecotourism products and related niche products;
- To enhance the conservation value of identified nature and ecotourism sites through joint Research and Development programs;
- To protect and promote the knowledge of local and indigenous communities and their traditional cultures.

#### 6.0 Research and Development Physical Infrastructures

- To develop centres (Tropical Biodiversity Centre, Marine Biodiversity Centre, Traditional Herbal Research Centre), laboratories and preservation areas to support culture and information collection and related research activities;
- To create *in-situ* or *ex-situ* living display sites comprising of representatives of the biologically diversity ecosystems found in marine protected areas and protected coral reefs;
- To provide and facilitate the development of biological databases in each centre that comply with national and international standards and are in line with the advancement of information, communication and technology (ICT).

#### 7.0 SOPs, Protocols and Guidelines for BRC labs and Culture Collection

- To ensure BRC operations and activities meet all relevant national and international standards and obligations;
- To develop material transfer agreement (MTA), terms and conditions and regulatory measures regarding the transfer of material for further R&D and

related activities under agreed project implementation framework by concerned parties; and

• To ensure high standard of safety in all operations and procedures practiced by the local and foreign researchers.

#### 8.0 BRC Operational capacity, services efficiency and effectiveness

- To increase R & D efficiency in terms of desired and deliverable outputs of all R
   & D activities in priorities areas;
- To continue to improve the structure and operational activities of BRC in accordance with international standards and frameworks;
- To implement and improve Human Resource Development (HRD) through joint projects, cooperation, training, seminars, workshops, conferences meetings, networking and collaborative projects;
- To continue to explore more joint R & D with other foreign research institutions and facilitate the exchange of information and expertise;
- To continue to improve and enrich BRC collection and repository into the database to meet international standards for national and international references;

#### 9.0 International recognition and prestige

- To increase the relevance of established centres (BRC, TBC, MBC and THRC) to all international forums & agendas through active participation in all related international forums;
- To observe the international standards, obligations and frameworks on sustainable development and wise use of biological resources;

• To establish International links and increase the globalisation of businesses;

## 10. Development of TBC, BRC, MBC, THRC Physical infrastructures & educational displays for Biodiversity promotion and education

- To ensure the right message of biodiversity conservation and its wise use reaches the target group;
- To increase interest and awareness of biological and conservational issues
  within the general public through interactive activities organized to nurture
  their continuous support;
- To develop cost effective techniques, resources and display items for educational visits;

#### 11. Biodiversity- Educational Awareness

- To sustain the support of the community for the biodiversity conservation policy and resource strategy;
- To instill and nurture the sense of belonging of all generations through a series
  of modules at respective education levels:- KG/ primary level, secondary and
  upper secondary and above;
- Applying best national and international practices for delivering messages about biodiversity;
- To fill the gap in biological expertise through creation of educational opportunities and career development;

#### 12. Excellence in Biodiversity-Educational Program for International Prestige

- To generate responsible and knowledgeable future generations to safeguard the nation's biodiversity;
- To be in line with international biodiversity awareness initiatives

# 13. Establishment of Traditional and Herbal Research Centre for the preservation of indigenous knowledge on plant use and its potential commercial purpose

- To promote and facilitate research activities on the conservation and use of traditional herbal in the country;
- To establish a traditional herbal and medicine database for national and international reference purposes to work towards their commercial production;
- To institutionalize the traditional herbal practices by community groups and potential private sector parties for the future management and wise-use of herbal;
- To preserve the local knowledge on the use and management of wild traditional herbal and to maintain the culture of traditional herbalist through informal education;
- To improve the general public's scientific knowledge about the use of wild plants as traditional herbal species;
- To strengthen institutional capacity through cross-sectoral and joint collaborations in the priority areas relating to traditional herbal use;
- To participate in regional initiatives and strengthen collaboration with international organizations and institutions involved with management and conservation of wild herbal;

- To document all data obtained from the study of traditional herbal for information sharing and exchange and equal access to opportunities for their development by all sectors and societies in the country;
- To provide technical advice to potential private sector groups in the commercial management and mass production of traditional herbals.

### **Key Activities**

Activities / Budget	Timeline
<ul> <li>HoB Centre</li> <li>Biodiversity Research; Management Plans; Economic         Diversification Activities; Constant Monitoring     </li> <li>Proposed new projects:</li> </ul>	Proposed new projects:  • Biodiversity Survey and Management of the proposed Ulu Belait Wildlife Sanctuary = 6 years
Biodiversity Survey and Management of the proposed Ulu Belait     Wildlife Sanctuary = \$4,763,700.00	<ul> <li>Wildlife Biodiversity Survey in the different forest types of Brunei Darussalam = 3 years</li> </ul>
<ul> <li>Wildlife Biodiversity Survey in the different forest types of Brunei Darussalam = \$2,140,700.00</li> <li>Biodiversity, reforestation and development of nature-based</li> </ul>	Biodiversity, reforestation and development of nature-based tourism for Tasek Merimbun ASEAN Heritage Park = 4 years
tourism for Tasek Merimbun ASEAN Heritage Park = <b>\$520,590.00</b>	<ul> <li>Status and distribution of proboscis monkey         (Nasalis larvatus) in Brunei Darussalam = 1.5         years</li> </ul>

Status and distribution of proboscis monkey (Nasalis larvatus) in	
Brunei Darussalam = <b>\$184,800.00</b>	
Discussion and formulation of a legal framework for HoB boundary	Throughout the whole duration of proposed new
for effective protection and management of biological resources	projects
within the HoB Boundary	
Handing over of scientific data to relevant agencies such as Wildlife	
Division, Forestry Department for the full protection and	
management of natural resources	
Facilitation of stakeholder meetings with relevant agencies on	
issues pertaining to natural resource protections and management	
Handing over of scientific data to relevant agencies such as Wildlife	At the end of each proposed project
Division, Forestry Department to ensure the future sustainable use	
of natural resources	
Facilitation of stakeholder meetings with relevant agencies on	
issues pertaining to natural resource use.	
action per turning to matural resource use.	
Promote community based nature-based tourism activities within	
the HoB area.	

Sharing of ideas a	nd discussions during trilateral meetings	Ongoing Trilateral meeting agenda yearly
especially on issu	es pertaining to cross-border protection such as	
Ulu Mendaram Pe	eat Swamp and Mulu Sg Ingei proposed	
transboundary pa	ırk	
Incorporation of p	oublic awareness programmes into each HoB	Yearly awareness programs
project		
	programmes for government agencies to promote	
the Vision of Brun	nei Heart of Borneo Initiative	
-	nental awareness programmes for different target	
groups e.g. school	children, government officials etc	
	versity field course will be incorporated into the	
	sanctuary project	
_	ourism programmes for controlled and managed	Yearly
nature-based tour	rs	
_	ortance of responsible green tourism in the Heart	
of Borneo.		
	nity based nature-based tourism activities within	
the HoB area		

<ul> <li>Provide educational and scientific information for the development of tourism activities and promotional materials</li> <li>Collaboration with the Tourism Development Board for marketing HoB as a brand name for responsible green tourism</li> </ul>	
Collaboration with Tourism Development Board on Certification of Green Guides.	
Marine Biodiversity Centre	
<ul> <li>To carry out periodical monitoring of coral areas in Brunei waters to check the health level of each coral ecosystem and area.</li> <li>To collect baseline data, analyse and store it as a national database for all the coral areas.</li> <li>To provide onshore facilities for coral propagation.</li> <li>To transfer the seeds to reef areas.</li> <li>To investigate areas that require artificial reefs to help existing reefs to flourish and expand as well as creating new habitats for marine life.</li> </ul>	Yearly priority activity and immediate
Estimated Budget Requirement = B\$200,000.00	

<ul> <li>To engage a consultant/expert/site staff:-</li> </ul>	Driewitz Irono dieto and Medium Torm
<ul> <li>To engage a consultant/expert/site stair.</li> <li>To do intensive studies on ecologically important habitats both for marine and inland waters.</li> </ul>	Priority, Immediate and Medium Term
<ul> <li>To identify if there are any highly vulnerable or endangered species present in these areas.</li> </ul>	
<ul> <li>To produce an information booklet on these habitats</li> </ul>	
To take baseline data for the database of Brunei invertebrates (for marine and inland waters).	
To collect specimens for taxonomic, preservation, research and educational purposes.	
To create or enhance the display gallery for these specimens	
To formulate a National Action Plan of Action for invasive aquatic species in Brunei Darussalam	
Estimated Budget Requirement = B\$1,500,000.00	
To work with Ministry of Education to formulate briefing kits, brochures and prepare syllabus or ECA for students and other participants (dive instructors/teachers). In appreciation give participants a standard Reef Check IndoPacific Region EcoDiver training kit which includes:	Yearly awareness program
i. A dry land training DVD,	

ii.	A CD with PowerPoints of all training materials (substrate,		
	invertebrate, fish) and site description		
iii.	A PDF copy of the Reef Check Instruction Manual		
iv.	Datasheets for use in water and spreadsheets for data input		
v.	Reef Check brochures, stickers and magnets inside a Body Glove		
	zip folder		
vi.	Information about the Government's new marine conservation		
	program.		
• To	o create and distribute marketing materials to all		
	udents/faculties/ schools and provide a basic and short course on		
	co-dive.		
• To	conduct a periodical briefing at MBC or relevant schools and		
	stitutions		
	periodically update the presentation and exhibition display at		
MI			
1,11			
Es	timated budget Requirement = \$500,000.00		
	timatea baaget requirement \$200,000.00		
De	evelopment of BRC		
<u> </u>	evelopment of DAC		
• To Est	tablish I abs layout install lab bonshos, finalize list and numbers		
	tablish Labs layout, install lab benches, finalize list and purchase	Immediate and medium	
equipment			

• To	dentify areas that contain high (& sensitive) genetic resources for		
	servation and protection Develop TOR, SOP		
	•		
	ntification and Development of training courses and programs for		
	f and personnel in accordance to the needs of BRC with		
spe	cialization of areas in:		
i	Familiarisation with lab protocols, guidelines and management		
ii	Identification and characterizations of microbes;		
iii	Culture collection and management		
iv	Development of a microbe database		
v	Taxanomic and Ecological Studies of Forestry Microorganisms		
	in Brunei Darussalam and Capacity Building (Collaboration with		
	NITE)		
		T 1 1	
	develop and implement "Best Practice" SOPs, Protocols and	Immediate and medium	
Gu	idelines for lab activities and the management operation of BRC:		
i.	General requirements		
ii.	Biosecurity		
iii	Microorganism domain		
iv.	Human-derived domain		
• To:	set management procedures in accordance with CBD's agenda.	Medium and long term	
	conduct microbial biodiversity survey to develop the microbe	Ü	
- 10	conduct interoblar bloarversity survey to develop the interobe		

<ul> <li>database to pioneer the development of relevant industries.</li> <li>To develop targeted microbial isolation and collection program.</li> <li>To increase the standards of activities to comply with international criteria and gain relevant quality certifications</li> <li>To participate and link BRC with relevant international initiatives and international companies involved in biotechnology, pharmaceutical, etc.</li> </ul>	
Development of TBC	
To design and develop educational displays that are more interactive	Immediate and medium
and use cutting edge technology.	
To engage dedicated professionals in Biodiversity extension activities	
to provide training for locals to improve their skills and the knowledge	
of staff and relevant stakeholders	
To co-organize and conduct periodical educational and awareness	
briefings for students and the general public at TBC and MBC including:	
i. Public talks and Road Shows	
ii. Training/ Workshops/ Seminars/ Symposiums and Exhibitions	
iii. Field activities eg. BioRIC Notebook Scientific Project./ jungle	
trekking and scientific competitions	

<ul> <li>Production of publications, documentaries, posters, brochures, books, etc,</li> <li>Incorporate biodiversity into educational curriculum</li> <li>Participate in international biodiversity activities including establishing a visitor exchange program.</li> </ul>	
<ul> <li>Highlight the importance of conserving biodiversity, tropical rain forests and natural environments and the importance of maintaining the abundance of flora and fauna species to foreign visitors.</li> <li>Increase awareness about the importance of the Heart of Borneo</li> </ul>	
initiative and Marine Protection Area in increasing ecotourism and collaborative research.  Estimated budget Requirement = \$100,000.00	
Development of THRC	Immediate and medium
• To engage a consultant and site staff:	
i. To assist the establishment of laboratory facilities at the	
Traditional and Herbal Research Center, Sinaut.  ii. To survey, collect and analyze the data on local herbal	