Ministry of Industry and Primary Resources
of Negara Brunei Darussalam

Heart of Borneo

Project Implementation Framework
Negara Brunei Darussalam

FINAL REPORT

May 2008

Supported by :

Report prepared by :

Heart of Borneo

PROJECT IMPLEMENTATION FRAMEWORK for NEGARA BRUNEI DARUSSALAM

Final Report

Prepared for:

Ministry of Industry and Primary Resources
Jalan Menteri Besar
Bandar Seri Begawan BB3910
Negara Brunei Darussalam
www.industry.gov.bn

Supported by:

Brunei Shell Petroleum Company Sendirian Berhad (BSP)
Jalan Utara, Panaga
Seria KB3534
Negara Brunei Darussalam
www.bsp.com.bn

Brunei Forestry Department
Ministry of Industry and Primary Resources
Jalan Menteri Besar
Bandar Seri Begawan BB3910
Negara Brunei Darussalam
www.forestry.gov.bn

Prepared by:

ERE Consulting Group Sdn Bhd
9-2 & 9-3 Jalan USJ 21/6
47630 Subang Jaya, MALAYSIA
www.ere.com.my

CONTENTS

CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

General

In recognition of the immense benefits that a large-scale, landscape level conservation initiative would bring to the people of Borneo, the landmark Heart of Borneo declaration was signed by the governments of Brunei, Indonesia and Malaysia in February 2007. As the essence of this declaration lies in the spirit of voluntary transboundary co-operation, the three countries agreed, as a first step, to develop their respective project documents. These would then be the basis of a shared road map towards realizing the vision of the Heart of Borneo (HoB) initiative.

This Project Implementation Framework (PIF) was developed through a six-month study commissioned by the Ministry of Industry and Primary Resources (MIPR), with support from Brunei Shell Petroleum. The study was undertaken by a Task force headed by ERE Consulting Group Sdn Bhd, with guidance from the HoB National Steering Committee chaired by the Deputy Minister of MIPR.

Taking account of existing national plans and policies, as well as international agreements, this PIF sets out for HoB in Brunei, the relevance of the initiative, a vision and a set of objectives, a spatial plan, a set of strategies and interventions, and the framework required to guide, manage and implement it.

Objectives of HoB in Brunei

In order to realise the HoB vision, the the following objectives are proposed:

1. To conserve representative forest and freshwater habitats, as well as the full range of biological diversity therein; for the enjoyment and benefit of future generations of Bruneians.

2. To contribute towards economic diversification by developing non-timber use of forests, particularly nature tourism, biotechnology, and other innovative means.

3. To set out an integrated framework for the conservation and sustainable use of forests and related natural resources.

4. To re-establish forest connectivity and the greening of degraded areas, through forest rehabilitation, afforestation, reforestation other rehabilitative means.

5. To build public support towards the HoB initiative, and conservation awareness in general through the incorporation of avenues for public participation.

Spatial plan

A preliminary Brunei HoB boundary, which included approximately 61% of the country in HoB, was drawn at the HoB National Planning Workshop in 2006. This boundary was refined via two workshops and a number of field surveys held during this study. The resulting Interim HoB boundary as presented in this PIF envisages 74% (426,675 ha) of Brunei to be included in the HoB (Figure 1-3).

Although 74% is a significant percentage (and in all likelihood the highest among the three countries), it is essential that the HoB area contributes to the economic

development of the country and is not – and is not seen as – an area that is locked away from all economic use.

A six-tier zoning scheme is proposed for the HoB area. The recommended land use and treatment for each of the zones are listed in Table ES-1. Any land use activities other land those prescribed in this table shall require permission from the proposed Brunei HoB Council.

Table ES-1 : Recommended use and treatment of the six HoB zones

Zones	Recommended use	Treatment
Zone 1a **Protected Area (Existing)**	• Species & habitat conservation • Water catchment • Eco-tourism • Scientific research • Education and awareness • Low impact recreation (e.g. rafting, trekking) • Carbon sink • Fire protection • Local climate mitigation	Totally protected area; each having its own management plan.
Zone 1b **Protected Area (Proposed)**		
Zone 2a **Sustainable forestry area (Current Forest Reserves)**	• Sustainable harvesting of timber & forest products • Forest plantations • Non-commercial forest products by local native communities • Carbon sink • Fire protection • Local climate mitigation	Forest Reserves under sustainable forest management; no change in land use from forest without the agreement of the proposed Brunei HoB Council, but should allow for the establishment of forest plantations to a limit of 10,000 ha, avoiding areas with high conservation value forests.
Zone 2b **Sustainable forestry area (Current Stateland)**		
Zone 3 **Rehabilitation area**	• Forest rehabilitation • Reforestation • Carbon sink • Education & Awareness • Eco-tourism	Rehabilitation through replanting or natural regeneration, leading ultimately to rezoning.
Zone 4 **Settlements and human use area**	• Existing settlement with area designated for foreseeable future expansion • Sand mining in existing areas • Agro-based and SME • Oil, gas and mineral explorations and extraction	Zone of mixed human use that does not impact significantly on the environment or ecology of the other HoB zones (e.g. through air or water pollution crossing into adjacent zones) Strict management attention paid to impacts on adjacent HoB zones

A preliminary delineation of the six zones is given in Figure 2-8. It is noted that the recommended areas and mapping are not final in detail, and will need to be checked against official maps as well as the new Brunei Master Plan.

Strategies & interventions

Four strategies have been formulated to achieve the HoB vision for Brunei. Each strategy consists of a set of strategic thrusts and interventions. There are 36 interventions in total (Table ES-2).

Strategy 1 :
The unique biological resources of the HoB shall be conserved and used with due consideration for the long-term sustainability of ecosystems, focusing on strengthening the protected area network, transboundary cooperation and improving management capacity."

Although Brunei's forests are among the best preserved in the region, there is still ample scope for improvement, especially in the management of protected areas, protection of wildlife, and in the understanding of species and ecosystems.

The preservation of the Belait peat swamp forests is of global importance, as it is a carbon sink, so important in the mitigation of climate change, and could possibly be the best preserved forest of its kind in the world.

Transboundary co-operation with Sarawak is also high on the agenda, as this will ensure the integrity of Brunei's forests uninterrupted forest connection to the rest of the Heart of Borneo in Sabah and Kalimantan.

Brunei's forests are a storehouse of biological material with potential for use in the pharmaceutical and medical industry. It is therefore pertinent that an integrated programme be established for the discovery of this natural wealth, along with a legal framework to ensure that local communities and the nation as a whole derive maximum benefits.

Strategy 2 :
Tourism in the HoB shall be enhanced through development of niche nature tourism products and joint tourism promotion with the other Bornean countries. The scale of development shall take into account the environmental and cultural sensitivity of the areas being developed.

There is great potential in the nature tourism industry in Brunei, with the unique selling proposition being the chance to see a variety of different forest types, and rare wildlife (e.g. Proboscis monkey, hornbills) within a short distance from the capital. In this respect, nature tourism is seen as a key economic driver in the Brunei HoB.

Central to this is the development of an Ecotourism Masterplan, which will identify the various niches and areas to be developed, and specify the type and scope of development, based on the principles of ecotourism.

EXECUTIVE SUMMARY

The HoB presents an opportunity to enhance co-operation in tourism development between the three countries, and to this end the possible areas for mutual collaboration are highlighted in this report.

Local communities should benefit from eco-tourism. Therefore the potential areas for local community participation (e.g. local guides, food preparation) shall be identified and developed, and capacity building programmes run in tandem.

Strategy 3
The development of non-renewable resources shall be carried out in a manner that imposes minimal impacts on the environment and protects the integrity of forest connectivity.

The proposed HoB area contains much of the natural resource wealth of Brunei - a large portion of this area falls within onshore petroleum blocks, while coal deposits occur in various sites. The continued sustainable use these resources are of great importance to the economy and security of the country.

However, the economic benefits from mineral extraction should be weighed against the impact on the environment and ecosystem on a case-by-case basis. It is proposed that the HoB council be tasked with the responsibility of carrying out this assessment. In addition, it is acknowledged that mining concessionaires are important stakeholders in HoB, in that they are responsible as principle users, occupiers and managers of the land in their respective concession areas.

It is important that sand, which is an important aggregate for the construction industry, should continue to be extracted. However, emphasis should be given to increase the environmental sustainability of this activity.

Strategy 4
Continuous environmental education and awareness, with focus on community outreach programmes, shall be promoted to ensure the sustainability of the HoB initiatives

As the success of the HoB initiative requires the sustained support of all sectors of society, the initiative must be visible, with a clear message so that the public understands and champions its vision, objectives and strategies. To this end, an overall communications plan shall be developed, and avenues for public participation emphasised. It is envisaged that innovative community tree planting programmes shall provide the basic platform for public participation.

This strategy also takes into cognizance the eight ethnic groups that traditionally occupied the interiors of Brunei. Although the level of dependency on the forest for livelihood has decreased over the last two decades in tandem with an improved economic status, it is widely believed that the rich traditions and culture of these ethnic groups are slowly disappearing with the advance of modernisation. Therefore, the foremost task that should be undertaken is the documentation of indigenous knowledge of the environment.

Table ES-2 :Strategic thrusts and interventions

Strategy	Strategic thrusts	Interventions	
1	Enhance biodiversity conservation	B1	Enhance legal and management framework for biodiversity conservation
		B2	Develop institutional capacity for biodiversity conservation
	Improve understanding of biodiversity	B3	Establish the Brunei HoB 25 ha permanent forest dynamics research plot
		B4	Survey of endangered cats in Brunei
		B5	Survey of amphibians in Brunei
		B6	Survey of insect biodiversity in Brunei
		B7	Large mammal survey in the Inter-riverine Zone
		B8	Survey of fish and aquatic invertebrates in Brunei
	Strengthen the Protected Areas system	B9	Rapid assessment of the Protected Area System
		B10	Gazette Belait Peat Swamp Complex as a Forest Reserve, and extend Ulu Mendaram Conservation Area
		B11	Formulate a management plan for the Belait peat swamp forest
		B12	Capacity-building and preparation of a national action plan for the wise use of peatlands and reduction of fire risk
		B13	Conservation surveys and management of Kerangas forests
	Forestry and biodiversity	B14	Develop EIA process for the HoB area
	Develop the framework for bio-prospecting	B15	Generate legislation for biotechnology, including bio-prospecting
		B16	Establish national Bio-prospecting Programme
	Offsets and Payments for Ecosystem Services	B17	Study potential of carbon and biodiversity offsets
	Cross-border issues and co-operation	B18	Ulu Temburong National Park transboundary connectivity
		B19	Sungei Ingei/Gunung Mulu transboundary park
		B20	Belait peat swamp forest transboundary connectivity
		B21	Integrated management of Brunei Bay
		B22	Combat wildlife crime
		B23	Needs assessment for science-based management for CITES

EXECUTIVE SUMMARY

Strategy	Strategic thrusts	Interventions	
2	Enhance regional tourism cooperation through HoB	-	
	Enhance nature tourism products	T1	Formulate the National Ecotourism Masterplan
		T2	Establish the Brunei Green Guide Programme
		T3	Enhance local community participation in nature tourism
	Develop niche tourism products	T4	Facilitate birdwatcher tourism
		T5	Facilitate culinary tourism - The Hearty Food of Borneo
		T6	Facilitate macro-photography tourism - Brunei in Close-up
3	Manage environmental impacts of sand extraction	R1	Develop measures to minimise the impacts of sand extraction
	Manage environmental impacts of onshore oil, gas and coal exploration	-	
4	Develop HoB community outreach	E1	Develop the HoB national communications strategy
		E2	Develop the HoB community reforestation programme
	Develop Environmental Education	E3	Institutionalise Environmental Education at all levels of formal education
		E4	Develop environmental awareness programmes for adults
		E5	Establish the Brunei HOB Biodiversity field course
	Preserve Indigenous Knowledge	E6	Document indigenous knowledge

EXECUTIVE SUMMARY

Management

The successful implementation of the strategies and interventions requires a strong commitment from all stakeholders, a robust and effective management framework and strong backing from the Government. The magnitude of the task is immense but with organisation and resolve, it is achievable.

The country needs an institutional arrangement that can effectively steer and support translating the HoB PIF into successfully implemented programmes, both for the national endeavour and for the trilateral co-operation. As such, the creation of two key bodies are envisaged. First is National HoB Council, which will (amongst other tasks) provide guidance for the overall direction, management and timely implementation of the strategies interventions, as well as to report to His Majesty in Council. Second is the National HoB Centre, which will serve (amongst other tasks) as the main institution to facilitate the interventions and to carry out fundraising and marketing, and as the national HoB secretariat.

As it is essential that the current momentum in the HoB initiative is not lost due to a hiatus in activity, it would be prudent to establish a small unit to carry out interim activities, under the guidance of the existing National Steering Committee. This unit would be responsible (amongst other tasks) for the planning and development of the National HoB Centre, interim marketing and fundraising activities, and to coordinate interim HoB interventions.

To this end, it is recommended that the “Brunei Heart of Borneo Co-ordination Unit” be established as early as possible in 2008. Initially, it should be planned and budgeted for a two-year period. Over the two year period, it is currently estimated that the office will require B$1.6 million to operate and sustain itself. This figure is currently being revisited in the hope of making savings.

Preliminary cost estimates have been given for each of the 36 interventions. Based on these figures, the total cost for the 36 interventions over 9 years is B$ 9.4 million (It should be noted that these figures only include the basic costs for each intervention, and do not include the costs for subsequent long term implementation, which may be substantial in some cases).

Proboscis monkeys (*Nasalis larvatus*), Brunei river / M. Kavanagh

SECTION 1
Introduction

1.1 HEART OF BORNEO INITIATIVE

On 12th February 2007 in Bali, Indonesia, the Ministers responsible for forestry in Brunei Darussalam, Indonesia and Malaysia signed the Declaration on the Heart of Borneo Initiative – *Three Countries, One Conservation Vision* (Figures 1-1 & 1-2).

Borneo is one of the most important centres of biodiversity in the world. The island is home to at least 12 primate species, 350 bird species, 150 species of reptiles and amphibians and 15,000 known species of plants. Over the past decade, an average of 3 new species have been scientifically described per month.

Of equal significance, the island's forests are of critical value to the people of the Bornean nations for the economic goods and services they provide, as well as for the environmental functions they serve.

The area termed the 'Heart of Borneo' (HoB) is a uniquely rich, largely forested landscape. It is the only remaining place on the planet where the Indo-Malayan forests of Southeast Asia can still be conserved on such a large scale. It straddles the transboundary highlands of Brunei, Indonesia and Malaysia, and reaches out through the foothills into the adjacent lowlands (Figure 1-3, Table 1-1).

Table 1-1: Revised HoB area

Country/State	HoB area (ha)	Percentage of HoB
Kalimantan	15,776,718	65.4
Sabah	4,000,674	16.6
Sarawak	3,918,526	16.2
Brunei Darussalam	426,676	1.8
Total	**24,122,594**	**100**

Note: Figures based on preliminary HoB national planning workshops in Brunei Darussalam, Kalimantan and Sabah

The conservation of these forests is therefore a matter of both national and international concern. Although the governments of the three Bornean nations have already taken various measures to conserve and sustainably manage these forests at the national level, international co-operation is required to enable fully effective conservation. The full diversity of tropical forests cannot be maintained if they are reduced to a patchwork within an otherwise man-made landscape. There is ample scientific evidence to show that forest conservation requires the maintenance of very large blocks of inter-connected forest, without which there are adverse effects on such factors as the local climate, hydrology and species extinction rates.

The HoB initiative began with an exploratory international workshop that was held on 5-6th April 2005, hosted by Brunei's Ministry of Industry & Primary Resources (MIPR), with the assistance of WWF. The workshop presented the benefits of large-scale conservation thinking, reviewed issues facing the uplands of Borneo, and promoted the need for effective transboundary partnerships. It generated a conservation vision (Box 1) and an action plan for the Heart of Borneo.

SECTION 1 : INTRODUCTION

Since then, the ASEAN Heads of Government have endorsed the importance of conserving a network of protected areas in the Heart of Borneo (Kuala Lumpur, December 2005 and Singapore, November 2007) and the BIMP-EAGA Heads of Government have made this a Flagship Project which has their full support (Kuala Lumpur, December 2005 and Cebu, January 2007). In March 2006, at the 8th Conference of the Parties of the Convention on Biological Diversity in Curitiba, Brazil, the three Bornean governments affirmed their intention to work together to conserve and sustainably manage the Heart of Borneo.

In December 2006, the Indonesian Ministry of Forestry hosted a trilateral meeting in Jakarta to prepare for a formal declaration and the implementation that would follow. The Bali Declaration duly took place in February 2007 and committed the three Bornean nations to make the Heart of Borneo Vision a reality.

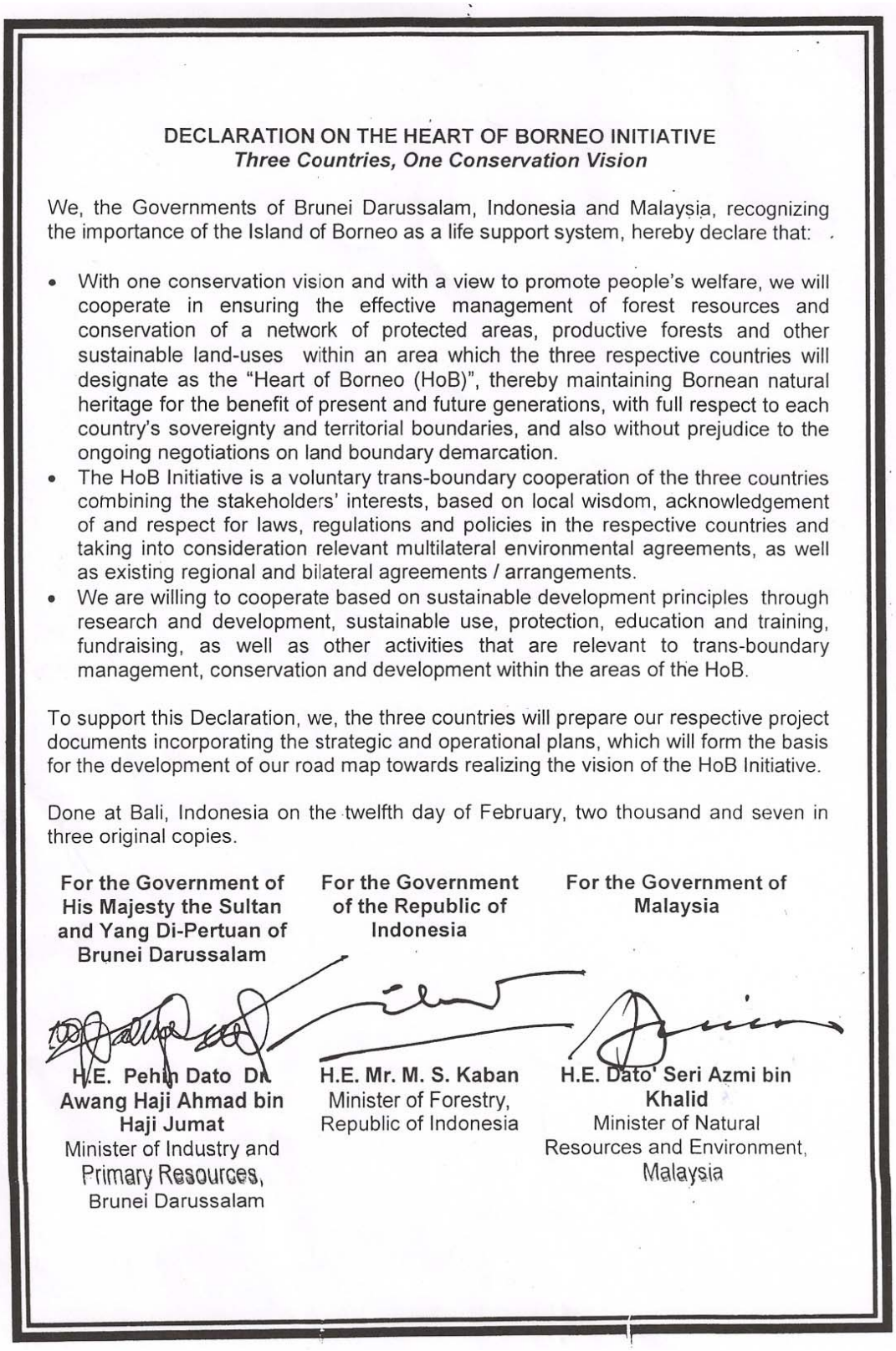
Subsequently, in July 2007, MIPR hosted the First Trilateral Implementation Meeting for HoB in Bandar Seri Begawan. Among the agreements at this meeting, Brunei, Indonesia and Malaysia undertook to prepare their own national HoB implementation plans, while at the same time developing international co-ordination mechanisms to ensure the harmonious development of the overall initiative (see Box 2 – Consensus at the 1st HoB Trilateral meeting)

Brunei's PIF is intended to be the country's roadmap for the Heart of Borneo.

Figure 1-1: The Ministers responsible for forestry for Brunei, Indonesia and Malaysia at the signing of the declaration of the HoB initiative

SECTION 1 : INTRODUCTION

Figure 1-2: The Heart of Borneo declaration



DECLARATION ON THE HEART OF BORNEO INITIATIVE
Three Countries, One Conservation Vision

We, the Governments of Brunei Darussalam, Indonesia and Malaysia, recognizing the importance of the Island of Borneo as a life support system, hereby declare that:

- With one conservation vision and with a view to promote people's welfare, we will cooperate in ensuring the effective management of forest resources and conservation of a network of protected areas, productive forests and other sustainable land-uses within an area which the three respective countries will designate as the "Heart of Borneo (HoB)", thereby maintaining Bornean natural heritage for the benefit of present and future generations, with full respect to each country's sovereignty and territorial boundaries, and also without prejudice to the ongoing negotiations on land boundary demarcation.
- The HoB Initiative is a voluntary trans-boundary cooperation of the three countries combining the stakeholders' interests, based on local wisdom, acknowledgement of and respect for laws, regulations and policies in the respective countries and taking into consideration relevant multilateral environmental agreements, as well as existing regional and bilateral agreements / arrangements.
- We are willing to cooperate based on sustainable development principles through research and development, sustainable use, protection, education and training, fundraising, as well as other activities that are relevant to trans-boundary management, conservation and development within the areas of the HoB.

To support this Declaration, we, the three countries will prepare our respective project documents incorporating the strategic and operational plans, which will form the basis for the development of our road map towards realizing the vision of the HoB Initiative.

Done at Bali, Indonesia on the twelfth day of February, two thousand and seven in three original copies.

For the Government of His Majesty the Sultan and Yang Di-Pertuan of Brunei Darussalam	For the Government of the Republic of Indonesia	For the Government of Malaysia
H.E. Pehin Dato Dr Awang Haji Ahmad bin Haji Jumat Minister of Industry and Primary Resources, Brunei Darussalam	**H.E. Mr. M. S. Kaban** Minister of Forestry, Republic of Indonesia	**H.E. Dato' Seri Azmi bin Khalid** Minister of Natural Resources and Environment, Malaysia

Box 1 – Heart of Borneo Conservation Vision

THE HEART OF BORNEO

Three Countries, One Conservation Vision

THE VISION STATEMENT

Drawn up by Consensus of the Participants at the Heart of Borneo Workshop,
held in Bandar Seri Begawan
5th & 6th April 2005

Borneo's forests, water and biological diversity are critical for the prosperity of the entire island. Their natural and cultural wealth is of local, national and global importance.

At the very heart of Borneo there lies a uniquely rich, largely forested landscape. It straddles the transboundary highlands of Brunei, Indonesia and Malaysia, and reaches out through the foothills into the adjacent lowlands.

Our vision for the heart of Borneo is that partnerships at all levels ensure effective management of a network of conservation areas, productive forests and other sustainable land-uses. Borneo's magnificent natural and cultural heritage is thereby sustained forever.

SECTION 1 : INTRODUCTION

Box 2 – Consensus from the 1st HoB Trilateral Meeting in Bandar Seri Begawan (July 2007)

1. The National Project Documents are crucial for realizing the HoB vision. In this regard, the respective countries shall formulate their respective National Project Documents as soon as possible. The target date for the completion of the National Project Documents shall be set at the upcoming BIMP EAGA Senior Officials/Ministers Meeting.

2. Each country has identified priority themes for national and international collaboration. These themes will be further expanded in the formulation of the respective National Project Documents.

3. The two proposals to establish a HoB Secretariat made by Brunei and Indonesia; and views expressed by Malaysia respectively, shall be taken up to the relevant authorities of the respective countries, and further tabled at the upcoming BIMP EAGA Senior Officials/Ministers Meeting.

4. Brunei will produce a paper identifying the functions that need to be carried out by an HoB coordinating body or decision-making body in each of the three countries

5. The meeting welcomes ADB's offer to undertake a fact-finding mission to the three countries in August 2007 to prepare technical assistance covering the Heart of Borneo initiative.

6. A series of joint scientific expeditions shall be organized into the Heart of Borneo areas under the name of "HoB Expedition Series". Malaysia is organizing the first expedition in Sarawak in June 2008, and invites counterparts from Brunei and Indonesia to participate.

7. A series of technical workshops on best management practices in conservation and sustainable development, including wildlife management shall be organized and the venues of these workshops shall be rotated amongst member countries. Indonesia will host the first one in 2008.

8. There is an urgent need to undertake joint promotion of nature tourism within HoB and in this regard, the meeting proposes that the BIMP-EAGA formulates a joint tourism promotion strategy.

9. A forum will be organized in Brunei in 2008 to deliberate the three National Project Documents / roadmap with special focus on transboundary cooperation.

10. A scientific conference of Heart of Borneo shall be organized to promote better understanding of the biological richness of the HoB. Brunei has volunteered to host this in early 2009.

11. The meeting supports the ASEAN PCF Peer Consultative Framework initiative which was undergone for the first time by Brunei Darussalam and HOB will benefit from this process.

12. The 2nd HOB Trilateral meeting will be held in Pontianak, West Kalimantan, Indonesia in January 2008.

1.2 BRUNEI DARUSSALAM'S NICHE IN THE HOB INITIATIVE

With a total land area of 5,765 km^2, Brunei Darussalam is the smallest country in Borneo. However, Brunei's forest cover contributes significantly to the island's biological richness. The last comprehensive forest census of 1984, by Anderson & Marsden, revealed 58% (341,000 ha) of the land area to be under primary forest cover. Forest conservation has been high on the Government's agenda since the National Forest Policy was introduced in 1990.

The situation in Brunei Darussalam is unique in that the wealth generated from its petroleum reserves has limited the need to exploit other forms of natural resources, in particular timber from its forest. In contrast, Indonesian and Malaysian Borneo have felt the impacts of much more intensive land-use to meet the demands of their own economies. Admirably, they have managed to set aside very large areas for total protection and sustainable management, but they have to cope with far greater population demands than does Brunei, as well as much more complex political and administrative structures.

In Brunei's case, the biological wealth, infrastructure, and stable political climate, backed by strong support of His Majesty's government and people towards environmental and conservation initiatives, have resulted in a situation which should enable the application of innovative and pioneering conservation initiatives here. Brunei has yet to fully develop the legal and administrative structures that are needed for the complex tasks of sustainably managing its national forests and wildlife. In some aspects (e.g., the silvicultural treatment of production forest), high standards are apparently the norm. In others, (e.g., wildlife management) it should be seen as an opportunity that capacity building has to virtually start from scratch. With appropriate investments and coupled with the current exemplary state of its forests, this should allow the country to leapfrog to the point of best institutions and best practices and give Brunei the potential to lead by example in biodiversity conservation and management in the region.

Brunei also has what appears to be a unique opportunity to join the vast, highlands of the Heart of Borneo, through representative examples of all major Bornean forest types, right the way to the mangroves and other coastal forests. Putting a mix of total protection and sustainable management in place for such a landscape would be of major global importance and should achieve a high level of international recognition.

Brunei has the opportunity to be the "Beacon of the Heart of Borneo", as suggested by the Deputy Minister of Industry & Primary Resources. Apart from all the positive factors mentioned above, it was Brunei that hosted the *Three Countries – One Conservation Vision* in Bandar Seri Begawan in April 2005. Thanks to the constructive involvement of all three Bornean governments, plus numerous other stakeholders and potential partners from the public and private sectors, this event set the ball rolling for HoB as a major regional endeavour. Since then, Brunei has seen the growth of a remarkable degree of public interest and support for HoB; and the country has hosted the first Trilateral meeting, as well as taking the lead in generating a national HoB roadmap, via the present project. Brunei's exemplary national effort can continue to light the way along a path of commitment and consensus for all three countries.

1.3 CONTEXT OF THE HEART OF BORNEO IN BRUNEI

1.3.1 HoB in Relation National Plans and Policies

1.3.1.1 National Development Plans

Brunei's economic development initiatives have been structured in terms of a series of five-year National Development Plans (NDP). Environmental policy directions and strategies are included in these plans, whereby the Government has continued to address the need to protect and conserve the country's environment from pollution and excessive exploitation of natural resources.

The 6th NDP (1991-1995) embraced the concept of sustainable development as central to socio-economic development. The main environmental issues addressed in the Sixth National Development Plan were environmental conservation and protection, solid waste management, water and air pollution.

The 7th NDP **(**1996-2000) further enhanced environmental protection components, through the introduction and implementation of the National Environment Strategy, which has the following thrusts:

- Raise environmental consciousness
- Integrate environmental dimensions in economic planning and development
- Improve environment and natural resources assessment and information database
- Strengthen urban and rural environmental improvement programmes
- Enhance environmental quality
- Protect vulnerable ecosystems, habitats and biodiversity
- Protect coastal and marine environmental resources
- Strengthen regional and international cooperation.

A total of B$59.7 million was allocated in the 7th NDP for the implementation of environment-related projects. Among the projects approved were the Wildlife Resource Inventory of Brunei Forests, Tropical Forest Biodiversity Development, Disused Land Area Rehabilitation, creation of new landfill areas and improvement of solid waste disposal system.

In the subsequent 8th NDP (2001-2005), environment-related projects were further increased to B$91.9 million or 1.26 per cent from the total development allocation.

1.3.1.2 Negara Brunei Darussalam Master Plan (2006 – 2025)

The latest Brunei Master Plan sets out the direction of growth of the country for the next twenty years. Although the study team has yet to gain access to this document, it is understood that there are no major conflicts in the Master Plan with the HoB vision. Most of the areas delineated as HoB are designated as National Landscape and Environmental Protection Zones. The National Landscape and Environmental Protection Zones include the existing reserves such as Ulu Mendaram, Bukit Teraja, Sungei Ingei, Bukit Bedawan and Temburong National parks. No major urban centre has been planned within the HoB boundary, although the Labi Corridor rural

development area is included. However a major road is being planned to cut across the Belait district connecting Miri to Limbang to Bangar in the Temburong District.

1.3.1.3 Negara Brunei Darussalam Master Plan (1987-2005)

The Negara Brunei Darussalam Master Plan (1987 – 2005) was completed in 1987. The plan, which took approximately two years to complete, included the preparation of comprehensive physical and conceptual framework for the realisation of national objectives; the identification of optimum locations for a full range of land uses; and the preparation of statutory physical development plans covering the whole of Brunei Darussalam.

In addition to extensive reporting on the macro-economic, sectoral, legislative and institutional aspects of development, the study resulted in the preparation of physical plans at four different levels:

a. The National Master Plan, at 1:200,000 scale, which set out long term development proposals, resulting from an evaluation of natural resources, alternative macro-economic scenarios and population forecasts.
b. 20-year Structure Plans for the three major urban areas, Brunei Muara, Kuala Belait-Seria and Tutong.
c. Development Planning Schemes which are designed as part of the statutory process of development control and include Proposal maps at 1:10,000 scale for the three major urban areas and a smaller 'Rural Areas' plan which covers all other land in Brunei Darussalam. And,
d. Detailed Local Plans, of which the Master Plan study prepared the Bangar Local Plan at a scale of 1:50,000 and recommended the preparation of others within the context of either the urban Development Planning Schemes or the Rural Areas Development Planning Scheme.

Relevance to HoB in Brunei

Of the component plans of the Negara Brunei Darussalam Master Plan, specific strategies that directly concern wildlife and forests are contained the National Master Plan (Main Volume) and the Rural Areas Development Plan. These strategies, which are briefly outlined below, fit very well with the HoB initiative.

Chapter 8 (Wildlife conservation) of the National Master Plan (Main Volume) contains recommendations for a Wildlife Conservation Enactment to replace the existing Wild Life Protection Enactment. This proposed legislation would provide for the establishment of a new Parks and Conservation Department, the establishment of a system of Totally Protected Areas (National Parks, Wildlife Sanctuaries and Nature Reserves) and for the licensing of activities in protected areas in accordance with the requirements of CITES. With regard to the Totally Protected Areas, the following areas were recommended:

In Belait district:	Ulu Mendaram Wildlife Sanctuary Sungai Ingei Wildlife Sanctuary Bukit Teraja Wildlife Reserve
In Tutong district:	Tasik Merimbun National Park (partly in Belait district) Tutong White Sands Nature Reserve

In Temburong district: Batu Apoi National Park
Labu/Selirong Wildlife Sanctuary
Peradayan Nature Reserve

The same chapter also contains recommendations for the development of management plans for the respective Totally Protected Areas, which would take into account the needs and customary rights of the native inhabitants.

In Chapter 9 (Forestry), forest management is rationalised based on recommendations from the Brunei Forest Resources and Strategic Planning Study (1984) to expand forest reserves, together with the recommendation from Chapter 8 to establish a system of Totally Protected Areas. It was noted that the latter recommendation would effectively transfer the jurisdiction over conservation forests from the Forest Department to the proposed Parks and Conservation Department.

With regard to a forestry development strategy, the Master Plan gave the following recommendations:

- Much of the primary forests currently on State land should be brought into the permanent forest estate, which should then be allocated to the various functional categories (namely production, protection, research/conservation, and recreation);
- No further grants of EDR or TOL land should be made within the proposed forest reserves and all development there should be strictly controlled.
- Although near total self-sufficiency is possible in the long term (70% of demand to be supplied from steady increase of second cuts yields from hill forests by 2050-55), a temporary deficit in the supply of hill forest logs would occur sometime after 2020. This deficit could be covered by additional imports, or by establishment of plantation forests. It was approximated that 10,000 ha would be required to be planted during the Master Plan period. A research programme into plantation types and sites should be initiated.
- No further logging should take place in the Andulau Forest Reserve (which had been extensively logged over by then), and sawn log extraction should shift to the Labi Hills reserve in Belait, the Ladan Hills reserve in Tutong and the Biang Ridge Reserve in Temburong.
- Existing sawmills should be brought under competitive pressure by allowing tariff free imports of sawn timber.
- Wastage should be reduced in the forest, sawmills, and in utilisation of end products.
- Finally, the potential of utilising waste and residual products of the industry to support the manufacture of wood-based panel products should be studied and evaluated.

1.3.1.4 National Forestry Policy

The National Forestry Policy of Brunei Darussalam, introduced in the 5th NDP, emphatically stresses and explicitly states that “In pursuance of the national development objectives and consistent with global strategies on bioecology in which the forests play a vital role, the Government of Brunei Darussalam commits itself to conserve, develop, and manage its forest resources for the promotion and upliftment of the quality of life; the promotion of social, political and economic well-being of the

people; and technological progress of the country; and for bringing about environmental amenity and ecological equilibrium over a time continuum".

The "Reduced Cut policy" has been implemented by the Forestry Department since 1990, via a quota system which limits the annual timber extraction to not more than 100,000 m^3 per year. Under the new policy, it is estimated that the remaining primary Mixed Dipterocarp forests (MDF) in State land and production forest reserves will be completely logged over by the year 2045 (Forestry Department, 1990). Under the previous extraction rate, which averaged over 200,000 m^3 per year, it was projected that the remaining primary forests would be completely logged over by 2015 (Forest Resources and Strategic Planning Study in 1984).

Relevance to the HoB

The National Forestry Policy clearly puts emphasis on environmental protection and the well-being on the Brunei people. The policy promotes sustainable forest management. The HoB aspires to exactly the things that the National Forestry Policy aims for. The HoB initiative will support the country's aspirations on the development and protection of its forestry resources.

1.3.2 HoB in relation to International Agreements and Conventions

Brunei is a party to the Convention in International Trade in Endangered Species of Wild Fauna and Flora (CITES) and has indicated an intention to join the Convention on Biological Diversity (CBD). Although Brunei has yet to join the United Nations Framework Convention on Climate Change (UNFCCC) or the Ramsar Convention on Wetland Protection (Ramsar), these also have relevance to HoB and His Majesty's Government may wish to consider becoming a party to them. A majority of countries have ratified them to ensure that environmental issues are addressed in the pursuit of development. There is, of course, a duty on the countries that ratify these conventions to observe the principles laid down in them in their relevant national and local level policies and plans.

1.3.2.1 CITES

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) obliges parties to regulate trade in listed species of animals and plants. It has no bearing on domestic protection of wildlife, etc. except in so far as it provides countries with legal avenues for redress and repatriation of animals and plants that have already been taken illegally out of the country and also obliges them to have policies, legislation and management that allow them regulate the flow of animals and plants into the country and to take action in cases where animals and plants have been brought in illegally and are found within the national borders.

These obligations require the creation of a "Scientific Authority" to provide relevant scientific and technical expertise and a "Management Authority" to provide the operational capacity. In practice, this creates a requirement for a considerable amount of expertise. At the very least, the Management Authority must be competent not only at regulating cross-border trade in close co-operation with the Customs Department, but it must also have staff with sufficient knowledge to identify CITES-

listed species. This calls for staff with a considerable degree of biological background knowledge, plus a “street-smart’” knowledge of how the wildlife trade works.

The global illegal wildlife trade is enormous, on a scale that places it with the illegal arms and drugs trades, with which it is often associated.

Relevance to HoB in Brunei

The illegal wildlife trade poses a threat to Bornean wildlife through a drain on wild populations of animals and plants. It is important that it be minimised and CITES is a major tool for this.

1.3.2.2 Convention on Biological Diversity

The Convention on Biological Diversity (CBD) is the first global agreement to recognize that conservation and sustainable use of biological diversity are the common concern for everyone and that they should become an integral part of the development process for every country. It is a framework agreement that sets out principles for national actions. Considerations of equity and shared responsibility are important elements of the CBD.

Brunei has yet to sign CBD but was a participant in the CBD side-meeting in Brazil in March 2006 when the three Bornean countries pledged to work together on developing the HoB.

The objectives of the CBD are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

Some of the relevant articles under this convention are :-

(i) Article 6 : General measures for conservation and sustainable use which include the development of national strategies, plans and programmes for the conservation and sustainable use of biological diversity and integrating as far as possible the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.

(ii) Article 8 : In-situ conservation by establishing a system of protected areas where special measures need to be taken to conserve biological diversity and developing where necessary, guidelines for the selection, establishment and management of protected areas.

(iii) Article 10 : Sustainable use of components of biological diversity by integrating consideration of the conservation and sustainable use of biological resources into national decision-making and supporting local populations to develop and implement remedial action in degraded areas where biological diversity has been reduced.

SECTION 1 : INTRODUCTION

Relevance to HoB in Brunei

Brunei is very rich in biodiversity. Large areas of the country have good forest cover and harbour a plethora of flora and fauna. Scientific work carried out by UBD and others has revealed a very rich flora composition, with Andulau FR having possibly the highest tree diversity in the world. These forests are a natural ecosystem. In addition to their intrinsic value as a natural wonder, they have great economic potential for biotechnological and pharmaceutical research. While the convention stresses the importance of protecting biodiversity, it also recognises the importance of using these resources in a sustainable manner.

The CBD provides a framework for conservation and sustainable use of biological diversity that can be adopted at the national level. Joining the CBD would give Brunei an obligation to formulate a National Policy on Biological Diversity. Besides fulfilling one of the requirements of the CBD, this would provide useful input for sustainable development planning in the country.

1.3.2.3 Agenda 21

Agenda 21 is a comprehensive global programme on sustainable development adopted at the United Nations Conference on Environment and Development (UNCED) held at Rio de Janeiro, Brazil in 1992. At UNCED, governments also adopted the Rio Declaration on Environment and Development. The Rio Declaration is a set of 27 principles that provides a context for specific proposals under Agenda 21. These principles define the rights of people to development and their responsibilities to safeguard the common environment.

The most important of the Rio Declaration principles with respect to the environment and development is *Principle No 4 : In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.*

Although there are a number of chapters in Agenda 21 which are related to sustainable development, the more important ones related to this study are as follows :-

(i) Combating deforestation: the importance of addressing the rapid global decline in forest cover has been repeatedly emphasized in many of the reports, decisions and recommendations of FAO, ITTO, UNEP, the World Bank, IUCN and other organizations (Chapter 11). The management activities related to combating deforestation are :-

- Sustaining the multiple roles and function of all types of forests, forest lands and woodlands
- Enhancing the protection, sustainable management and conservation of all forests, and the greening of degraded areas, through forest rehabilitation, afforestation, reforestation and other rehabilitative means
- Promoting efficient utilisation and assessment to recover the full valuation of the goods and services provided by forests, forest lands and woodlands
- Establishing and/or strengthening capacities for the planning, assessment and systematic observations of forests and related programmes projects and activities, including commercial trade and processes

(ii) Managing fragile ecosystems: Sustainable Mountain Development. Sustainable mountain development can be achieved through the proper management of highland resources, which are an important source of water, energy and biological diversity (Chapter 13). The management activities related to land use planning are :-

- o Improve coordination of regional efforts to protect fragile mountain ecosystems
- o Diversify mountain economies by creating and/or strengthening tourism, in accordance with integrated management of mountain areas
- o Integrate all forest, rangeland and wildlife activities in such a way that specific mountain ecosystems are maintained
- o Establish appropriate natural reserves in representative species-rich sites and areas

(iii) Integrating environment and development in decision-making. This can be achieved by improving and restructuring decision-making processes so that consideration of socio-economic and environmental issues is fully integrated and a broader range of public participation is fully assured (Chapter 8).

(iv) Integrated approach to the planning & management of land resources. This takes account of the fact that land resources are used for a variety of purposes which interact and compete with one another (Chapter 10).

(v) Conservation of biological diversity including the sustainable use of biological resources (Chapter 15).

(vi) Protection of the quality and supply of freshwater resources to ensure that the freshwater needs of the country are satisfied (Chapter 18).

Relevance to HoB in Brunei

Chapter 13 in Agenda 21 underpins the importance of forests and other natural habitats as fragile ecosystems that need protection, repositories for biological diversity and as important sources for freshwater supply. It also calls for land-use planning to be done in an integrated manner recognizing the importance of economic, social and environmental considerations in the decision making process. The principles in Agenda 21 provide a basis for the planning of the HoB area.

1.3.2.4 United Nations Framework Convention on Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC) is the global effort to combat global warming and its ultimate objective is the stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous man-made interference with the climate. The relevant commitments of parties are :-

(i) Develop, periodically update, publish and make available, national inventories of anthropogenic emissions by sources and *removals by sinks* of greenhouse gases.

(ii) Promote sustainable management, and promote and cooperate in the conservation and enhancement, of sinks and reservoirs of greenhouse gases, including biomass, forests and oceans.
(iii) Take climate change considerations into account, to the extent feasible, in relevant social, economic and environmental policies and actions.

Relevance to HoB in Brunei

Brunei has recently ratified the UNFCC. As Brunei's forests (in particular its peat swamp forests) are carbon sinks of global importance, the HoB initiative provides an avenue for Brunei to undertake – and to be seen to undertake – its global responsibility in the maintenance and sustainable management of these areas. In this regard, the outcome of the 13th Conference of Parties to UNFCC and the third meeting of the Parties to the Kyoto Protocol, to be hosted by Indonesia in December 2007, will be of great interest to Brunei, as it is expected to address the incorporation of forest issues (including reforestation and afforestation) in the climate change framework.

1.3.2.5 The Wetland (Ramsar) Convention

The Wetland, or Ramsar, Convention was adopted in the Iranian city of Ramsar in 1971. The official name of the treaty, *The Convention on Wetlands of International Importance especially as Waterfowl Habitat,* reflects the original emphasis on wetlands as waterbird habitat. Nowadays, however, the Convention is generally known as *The Wetland Convention*, reflecting its current scope to cover all aspects of wetland conservation and wise use. Wetlands are recognised as ecosystems that are extremely important for biodiversity conservation and for the well-being of human communities.

The Convention helps member countries to develop national policies and actions, including legislation to make the best possible sustainable use of their wetland habitats. It also provides an avenue for members to make their voices heard internationally and to bring prestige for the wetlands that are designated for the List of Wetlands of International Importance. Member countries must designate at least one wetland for the List.

The Convention also facilitates sourcing expert advice and international assistance on wetland matters, including site-specific management issues.

Relevance to HoB in Brunei

Relatively large areas of Brunei qualify as wetlands under the Convention. They include coral reefs in shallow water, coastal lagoons, mangroves, shallow lakes, floodplains and swamps of various kinds, plus human-made wetlands such as ponds and sewerage farms. Outstanding sites within the proposed HoB area would include Tasik Merimbun, Belait Peat swamp and Pulau Selirong. The Ramsar Convention presents an opportunity for Brunei to engage with the international community on showcasing and managing national sites that are of global significance individually, as well as being outstanding examples of the conservation and sustainable use that are central to the overall HoB vision.

1.3.2.6 ASEAN Agreement on the Conservation of Nature and Natural Resources

The ASEAN Agreement on the Conservation of Nature and Natural Resources was signed on the in July 1985, and came into force on the in 1986. The two fundamental principles of the agreement are as follows:

1) The Contracting Parties, within the framework of their respective national laws, undertake to adopt singly, or where necessary and appropriate through concerted action, the measures necessary to maintain essential ecological process and life-support systems, to preserve genetic diversity, and to ensure the sustainable utilization of harvested natural resources under their jurisdiction in accordance with scientific principles and with a view to attaining the goal of sustainable development; and
2) To this end they shall develop national conservation strategies, and shall co-ordinate such strategies within the framework of a conservation strategy for the Region.

The agreement contains 8 chapters, on the following topics:

I. Conservation and Development
II. Conservation of Species and Ecosystems
III. Conservation of Ecological Processes
IV. Environmental Planning Measures
V. National Supporting Measures
VI. International Cooperation
VII. International Supporting Measures
VIII. Final Clauses

Relevance to HoB in Brunei

This agreement is highly relevant to the HoB initiative, as it sets out a comprehensive framework for a national conservation (and environmental) strategy, as well as for regional cooperation. It should be noted that Brunei has signed, but has yet to ratify this agreement, the spirit of which was reinforced at the ASEAN summit in Singapore, November 2007, which included within it a detailed articulation of issues relating to sustainable development, including the following paragraph under the protection of natural habitats:

Paragraph 27: To promote conservation and sustainable management of key ecosystems, including forest, coastal, and marine habitats, such as coral reefs, through initiatives, in particular, the "Heart of Borneo", “Forestry Eleven forum”, and the “Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security”;

1.3.2.7 ASEAN Agreement on the Establishment of the ASEAN Centre for Biodiversity

The Agreement on the establishment of the ASEAN Centre for Biodiversity (ACB) was signed in April 2005, and the ACB was launched at the 9th Informal ASEAN Ministerial Meeting on 27 September 2005. The Agreement also establishes the ASEAN Biodiversity Fund with voluntary contributions of the ASEAN Member Countries, other governments and organizations as approved by the Governing

SECTION 1 : INTRODUCTION

Board. The Fund is to be utilized to meet the expenses of the Centre and its various initiatives.

Based in Manila, the ACB is an intergovernmental and international regional centre which aims to create, promote, and develop links with the public, private sector, civil society, international development institutions, and donor community for the sustainable use of biodiversity.

ACB's core function is to build strategic networking and partnerships so that resources could be mobilized optimally to augment effective programmes and enable knowledge management. The ACB is managed by a Governing Board, which is composed of the ASEAN Senior Officials on the Environment (ASOEN) and the Secretary-General of the ASEAN.

Funded by the ASEAN and the European Union, ACB will further enhance the collaboration among ASEAN nations to fulfill obligations to relevant treaties on conservation.

Relevance to HoB in Brunei

This Agreement is relevant to the design of management and implementation mechanisms for the HoB initiative at the national and trilateral levels. The ACB should be able to assist with networking and advice on fundraising and technical matters.

1.4 HOB VISION FOR BRUNEI DARUSSALAM – A POSSIBLE SCENARIO

By the mid-21st century, Brunei will have more than doubled its human population and its off-shore oil and gas reserves will have depleted considerably. Land-based wells will be more important and the overall economy will have diversified during the first half of the century.

The coastal zone, especially in Belait will be much more densely populated than today, with well developed light industry, especially that which requires high energy inputs and a skilled workforce producing high-tech, high value products. Coastal land-use will have taken account of climate change with measures to protect against a raised sea level and violent storms.

Over the previous 50 years, the number of people on the planet without access to proper supplies of drinking water will have more then doubled from the one billion that was estimated to be the case in 2000. Brunei will not suffer from this major global problem because it will have managed its water catchments and swamplands intelligently under its Heart of Borneo regime. Thus, domestic, industrial and agricultural water needs will be well catered for.

The majority of the country will remain as a forested landscape. The impacts of roads and other infrastructure, plus land-based oil, gas and mineral extraction, will have been carefully managed to mitigate adverse environmental impacts. Tourism and bio-technology will have led other economic growth. Tourism will be based on specific niches that are consistent with the strong “Heart of Borneo” brand that will have been built up over the years through the joint efforts of the three Bornean nations.

Birds, orchids, insects and amphibians will all attract a steady stream of enthusiasts from the huge world market that will have lived up to its promise at the turn of the century. They will choose Brunei because of its well conserved forests and wildlife, safe image, easy logistics, good guides and generally high level of comfort and luxury, supplemented by its uniquely fascinating Islamic culture for the less “eco-minded” members of the visiting families, plus the ready availability of packages that allow visits to other parts of Borneo.

Over the years, every tree that has fallen, every animal that has disappeared from its habitat in other countries, will have increased the conservation, scientific and tourism values of Brunei and those few other nations that have managed theirs successfully. The idea of the Heart of Borneo as a huge expanse of tropical rainforest will be well established around the world, making it a “once-in-a-lifetime” destination for many.

Biotechnology will not have matched the absolute economic value of tourism, but it will have grown into a major income earner, thanks to capacity-building based on carefully negotiated support from overseas experts. The foundation of this sector, like that of tourism, will of course be the carefully managed flora and fauna and their habitats. Timber and other forest products will continue to be carefully harvested, with yields managed to balance national demands against long-term sustainability. The country will also have integrated the management of carbon and biodiversity sequestration into its forestry regimes, having profitably marketed the offsets as model projects in this sector.

Brunei will have a strong global reputation as a stable country with an environment that provides both a pleasant home for its people and a haven for a treasure-house of flora and fauna that extends from its rugged interior, through the slopes and swamps, all the way to the sea.

1.5 HOB OBJECTIVES FOR BRUNEI DARUSSALAM

In order to realise the HoB vision for Brunei Darussalam, the HoB initiative in Brunei Darussalam shall have the following objectives:

1. To conserve representative forest and freshwater habitats, as well as the full range of biological diversity therein; for the enjoyment and benefit of future generations of Bruneians.

2. To contribute towards economic diversification by developing non-timber use of forests, particularly nature tourism, biotechnology, offsets and other innovative means.

3. To set out an integrated framework for the conservation and sustainable use of forests and related natural resources.

4. To re-establish forest connectivity and the greening of degraded areas, through forest rehabilitation, afforestation, reforestation other rehabilitative means.

5. To build public support towards the HoB initiative, and conservation awareness in general through the incorporation of avenues for public participation.

Alan (*Shorea albida*) peatswamp forest, Ulu Belait / D. Ong

SECTION 2
Spatial plan

SECTION 2 – SPATIAL PLAN

2.1 INTRODUCTION

The overarching vision of the HoB initiative is to attain forest conservation on a large-scale through the establishment of a core system of protected areas, linked by a network of sustainably managed, productive forests. In order to translate this vision (as well as the five HoB objectives for Brunei) into a reality on the ground, it is necessary to first develop a spatial plan, which will define, identify and zone the areas to be included in the HoB.

It is essential that the HoB area contributes to the economic development of the country and is not – and is not seen as – an area that is locked away from economic use. The spatial plan will allow for the designation of appropriate, sustainable uses of the various zones, as well as the formulation of the strategies and interventions required in order to strengthen the conservation and management of the entire area. The recommended areas and mapping in this report are not final in detail. They will need to be checked against official maps as well as the new Brunei Master Plan, and corrected as necessary. (See Intervention B9 which includes an overall mapping exercise for Protected Areas).

2.2 FORMULATION OF THE BRUNEI HOB BOUNDARY

The preliminary Brunei HoB boundary was drawn based on consensus reached at the HoB National Planning Workshop in May 2006. It was estimated that under this interim configuration, the HoB area would cover 61.3% (355,278 ha)[1] of Brunei (Figure 2-1).

This boundary was re-assessed at the Inception Workshop of this study in July 2007. The main outcome from this session was that the feasibility of including additional, very important conservation areas (especially Andulau Forest Reserve and Pulau Selirong) should be investigated, and that the HoB boundary should be revisited and refined.

Following the Inception Workshop, brief field surveys were conducted as necessary, and the Task Force was then able to refine the Interim HoB boundary. Based on the existing forest connectivity, it was found that it was possible to include Andulau Forest Reserve and Pulau Selirong in the HoB area, as well as making some other adjustments based on current land-use. The Interim boundary as presented in the Interim Report of this study envisaged 74% (426,675 ha) of Brunei to be included in the HoB (Figure 2-1).

On the basis of feedback received at the Interim Steering Committee and the Interim Stakeholders Workshop (both held in October 2007), this recommendation is maintained in this report. The zones have, however, been modified into the scheme recommended below; and greater emphasis is placed on the positive benefits from recommended land-uses.

Note that the HoB boundary does not define forest type or forest cover in Brunei. It defines the zone that can be managed as forested landscape. This includes forest itself of various natural types and ranging from pristine to disturbed or degraded, as

[1] Since re-measured under this study at 63% (362,476 ha) of Brunei

well as some forest plantation areas. The HoB land is under various protection statuses, from totally protected, through forest reserves to stateland. Embedded within the HoB area, there are also places where the forest has been replaced with other land-uses. The complex management issues that arise from this can be addressed through a system of zoning.

2.3 BRUNEI HOB ZONING SCHEME

A six-tier zoning scheme is proposed to realise the HoB vision and objectives for Brunei. The criteria for the six zones are defined below, with the accompanying recommended land uses described in the Table 2-1.

Zone 1a – Protected Area (Existing)

This zone encompasses existing protected areas, including areas that are recognized as protected areas by His Majesty's government, but have yet to be gazetted.

Zone 1b – Protected Area (Proposed)

This zone encompasses areas that are known to be of high conservation value (for wildlife, soil and water protection, etc.), but do not have protection status at present. This zone is temporary, in as much as the goal is to protect these areas through moving them into Zone 1a.

Together, Zones 1a and 1b should encompass all of the key sites for total protection in the HoB area. The Task Force recognises, however, that additional sites could be recommended in future as further survey information becomes available.

Zone 2a – Sustainable forestry area (Existing Forest Reserves)

This zone comprises of all Forest Reserves that fall within the HoB boundary, other than those that are assigned to Zone 1a or 1b above.

Zone 2b – Sustainable forestry area (Existing Stateland forests)

This zone comprises of all land within the overall HoB boundary that is not currently assigned to any other zone. It is intended to be temporary, in as much as the goal is to gazette the area as Forest Reserve, thus moving it into Zone 2a.

Together, Zones 2a and 2b encompasse the balance of the total HoB area that is not included in the other four zones. It is the "default area" and is currently under forest of various types. This strategy is intended to ensure the maintenance of the forested landscape that is central to the HoB vision, by giving the Forestry Department control over the whole area to manage sustainable economic forestry activities (timber harvesting, silviculture and forest plantation, as well as harvesting of non-timber forest products). This is currently the case in as much as such activities are either currently being carried out, or shall be carried out in the future, both in production Forest Reserves, and what is currently state land.

SECTION 2 – SPATIAL PLAN

Zones 2a and 2b play a critical role in maintaining the overall forest size and connectivity that is essential to maintain the full ecological functioning of Brunei's forests that is both a national goal and the main goal of the overall HoB initiative. As well as yielding multiple benefits in itself (e.g., river basin protection, timber and non-timber forest products, wildlife habitat, carbon sink, fire protection and local climate mitigation) it will provide buffer zones and wildlife corridors for and between the totally protected areas of Zones 1a and 1b.

Nevertheless, the Task Force recognises that there will almost certainly be future demands on the land in Zones 2a and 2b that may require some non-forest use in the area or for sites within it to be degazetted and moved into Zone 4 for other human use. For example, surveys for oil, gas and minerals are already envisaged and these could result in extraction operations. It is impossible at this stage to predict the exact localities or scale of such operations, so the zoning objective is to create a regime that protects the forest and ensures that the HoB vision is taken fully into account along with any other relevant national objectives when future land-use decisions are made. It is therefore very important that such land-use change should only be made with the agreement of the HoB Council. This provision is included in the recommendation for all zones. (See Table 2-1).

Zone 3 – Rehabilitation area

This zone encompasses sites where the natural forests have been degraded (e.g., due to forest fires) which are situated in areas critical for the re-establishment of forest connectivity (as described above for Zones 2a and 2b), therefore requiring human intervention to help expedite the natural reforestation process. This zone may be upgraded to Zone 1 or Zone 2 after a period of time.

Zone 4 – Settlements and human use zone

This zone encompasses sites of non-forest economic use or low-density human habitation that are located within the HoB area. These include existing and future developments along existing road corridors.

The following table lists for each zone the respective recommended land uses, treatments and general types of interventions that may be required. (Specific interventions are elaborated in the next chapter.)

SECTION 2 – SPATIAL PLAN

Table 2-1 : HoB zones, recommended land uses, and general interventions required

Zones	Recommended use	Treatment	General interventions required
Zone 1a **Protected Area (Existing)** **Zone 1b** **Protected Area (Proposed)**	• Species & habitat conservation • Water catchment • Eco-tourism • Scientific research • Education and awareness • Low impact recreation (e.g. rafting, trekking) • Carbon sink • Fire protection • Local climate mitigation	Totally protected area; each having its own management plan.	• Gazette using legislation appropriate to meet the specific area management objectives **(Zone 1a)** • Identify and gazette additional important areas using legislation appropriate to meet the specific area management objectives **(Zone 1b).** Once gazetted, these sites will be upgraded to Zone 1a • Develop appropriate legislation and institutional capacities to manage conservation areas such as National Parks and Wildlife Sanctuaries • Develop site specific management and operational plans • Delineate and map boundaries on the ground
Zone 2a **Sustainable forestry area (Current Forest Reserves)** **Zone 2b** **Sustainable forestry area (Current Stateland)**	• Sustainable harvesting of timber & forest products • Forest plantations • Non-commercial forest products by local native communities • Carbon sink • Fire protection • Local climate mitigation	Forest Reserves under sustainable forest management; no change in land use from forest without the agreement of the proposed Brunei HoB Council, but should allow for the establishment of forest plantations to a limit of 10,000 ha (after Brunei Forest Resources and Strategic Planning Study, 1984)[2], avoiding areas with high conservation value forests.	• Maintain and manage as production Forest Reserves **(Zone 2a)** • Survey and gazette relevant stateland forests as production Forest Reserves **(Zone 2b)** • Delineate and map boundaries on the ground • Refer all proposed conversions from natural forest to any other use (including timber plantations) to the proposed Brunei HoB Council. In this case, the role of the Council is to advise the Leadership on an appropriate decision. • Establish EIA regulations, with oversight by the HoB Council (See Intervention B14 and Section 3.4.3)

SECTION 2 – SPATIAL PLAN

Zones	Recommended use	Treatment	General interventions required
Zone 3 **Rehabilitation area**	• Forest rehabilitation • Reforestation • Carbon sink • Education & Awareness • Eco-tourism	Rehabilitation through replanting or natural regeneration, leading ultimately to rezoning.	• Survey and map potential areas, without setting a time limit • Establish replanting and management programmes, including education, awareness and tourism • Gazette using legislation appropriate to meet the specific area management objectives, e.g. as a protected area (Zone 1a) or Forest Reserve (Zone 2a) • Tree planting programmes involving public (Intervention E2)
Zone 4 **Settlements and human use area**	• Existing settlement with area designated for foreseeable future expansion • Sand mining in existing areas • Agro-based and SME • Oil, gas and mineral explorations and extraction	Zone of mixed human use that does not impact significantly on the environment or ecology of the other HoB zones (e.g. through air or water pollution crossing into adjacent zones) Strict management attention paid to impacts on adjacent HoB zones	• Liaison with District Offices, local communities and TCP to define zone limits in relation to existing settlements, sufficient for long-term human use without further expansion thereafter. • Develop guidelines and regulations for allowable activities • Develop sustainable management plan and regulations for existing sand mining • Develop protocols for environmental management for oil, gas and mineral extractions, meeting the highest possible global standards, with those of BSP as a guide • Establish EIA regulations, with oversight by the HoB Council (See Intervention B14 and Section 3.4.3)

Note:
Any land use activities other land those prescribed in Table 2-1 shall require permission from the proposed Brunei HoB Council

SECTION 2 – SPATIAL PLAN

2.4 BRUNEI HOB ZONES

The areas envisaged to be included within the six HoB zones are listed below. See Figure 2-8.

Zone 1a – Protected Area (Existing)

The areas falling within Zone 1a: Protected Area (Existing) are listed in the table below. See Figure 2-2.

Table 2-2 : Areas falling within Zone 1a

District	Area	Current designation	Approx. size (ha)
Belait	Bukit Teraja Protection Forest	Within Labi Hills FR	6,825
Belait	Bukit Batu Patam Protection Forest		921
Belait	Bukit Ulu Tutong Protection Forest		251
Belait	Sungai Ingei Conservation Area		18,491
Belait	Ulu Mendaram Conservation Area	State land	6,170
Belait	Belait Peat Swamp Forest Research Area		1,492
Belait	Badas Conservation Forest	Badas FR	76
Belait	Ulu Badas Forest Research Reserve	N/a	N/a
Belait	Luagan Lalak Recreation Forest	Within Labi Hills FR	375
Belait/Tutong	Virgin Jungle Reserve (Compartments 7 & 8)	Within Andulau FR	260
Belait/Tutong	Proposed Biodiversity Centre (Compartments 5&6)		112
Tutong	Bukit Bedawan Protection Forest	Within Ladan Hills FR	7,633
Tutong	Benutan Catchment Protection Forest		2,932
Tutong	Tasik Merimbun ASEAN Heritage Park	State land	7,800
Temburong	Ulu Temburong National Park	Within Batu Apoi FR	35,381
Temburong	Peradayan Recreation Forest	Peradayan FR	997
Temburong	Pulau Siarau Nature Reserve	N/a	488

Zone 1b – Protected Area (Proposed)

The areas proposed to be included in Zone 1b: Protected Area (Proposed) are listed in the table below. See Figure 2-3.

SECTION 2 – SPATIAL PLAN

Table 2-3 : Areas falling within Zone 1b

Proposed area	Current designation	Rationale for protection	Approx. size (ha)
Andulau Conservation Forest	Production forest (apart from Compartment 5,6,7,8)	• High tree biodiversity • Previously logged over	13,506
Ulu Mendaram Conservation Forest Extension	State land	• To protect entire peat swamp block south of Mendaram river	7,760
Ulu Temburong National Park Extension	Batu Apoi FR proposed 2nd extension	• Additional buffer zone for Temburong National Park	2,644
Pulau Selirong Conservation Forest	Selirong production Forest Reserve	• Important representative coastal wetland habitat	N/a
Bukit Teraja Protected Forest Extension	State land	• To protect ridge • To maintain connectivity with Ulu Mendaram CA	N/a

Zone 2a – Sustainable forestry area (Existing Forest Reserves)

This zone comprises of all Forest Reserves that fall within the HoB boundary other than those assigned to Zones 1a or 1b above. See Figure 2-4.

Zone 2b – Sustainable forestry area (Existing Stateland forests)

This zone comprises of all Stateland forests that fall within the HoB boundary. The two major areas in this zone are the Belait peat swamp forest, and the forests in the Inter-riverine Zone (IRZ) between the Tutong and Belait rivers. See Figure 2-5.

Zone 3 – Rehabilitation area

Additional ground surveys are required to identify areas to be included in Zone 3. In the interim, the following areas are identified as potential sites (See Figure 2-6) :

- The degraded forest linking Belait peat swamp forest and the sea, west of the Belait river.
- The degraded forests between Andulau Forest Reserve and Bukit Sawat.
- The degraded forests east of Labu Estate and Ulu Senukoh in Temburong District, especially where there is clearance and disruption of natural drainage patterns alongside the road to the border with Lawas.

Zone 4 – Settlements and human use zone

Zone 4 includes the two main road corridors within the HoB, i.e. the Labi and Kuala Balai roads, and a number of small villages including Kg Belabau and Supon in Tutong, as well as Kg Selapon and Labu Estate in Temburong. See Figure 2-7.

Tasik Merimbun, Tutong / D. Ong

SECTION 3
Strategies & interventions

SECTION 3 – STRATEGIES & INTERVENTIONS

3.1 INTRODUCTION

Four strategies have been formulated to achieve the HoB vision for Brunei Darussalam. Each strategy consists of a set of strategic thrusts and corresponding interventions, which are outlined below:

Strategy 1
The unique biological resources of the HoB shall be conserved and used with due consideration for the long-term sustainability of ecosystems, focusing on strengthening the protected area network, transboundary cooperation and improving management capacity.

Strategic thrusts
3.2.2 Enhance biodiversity conservation
3.2.3 Improve understanding of biodiversity
3.2.4 Strengthen the Protected Areas system
3.2.5 Forestry and biodiversity
3.2.6 Develop the framework for bio-prospecting
3.2.7 Offsets and Payments for Ecosystem Services
3.2.8 Cross-border issues and co-operation

Interventions
B1 Enhance legal and management framework for biodiversity conservation
B2 Develop institutional capacity for biodiversity conservation
B3 Establish the Brunei HoB 25 ha permanent forest dynamics research plot
B4 Survey of endangered cats in Brunei
B5 Survey of amphibians in Brunei
B6 Survey of insect biodiversity in Brunei
B7 Large mammal survey in the Inter-riverine Zone
B8 Survey of fish and aquatic invertebrates in Brunei
B9 Rapid assessment of the Protected Area System
B10 Gazette Belait Peat Swamp Complex as a Forest Reserve, and extend Ulu Mendaram Conservation Area
B11 Formulate a management plan for the Belait peat swamp forest
B12 Capacity-building and preparation of a national action plan for the wise use of peatlands and reduction of fire risk
B13 Conservation surveys and management of Kerangas forests
B14 Develop EIA process for the HoB area
B15 Generate Legislation for biotechnology, including bio-prospecting
B16 Establish national Bio-prospecting Programme
B17 Study potential of carbon and biodiversity offsets
B18 Ulu Temburong National Park transboundary connectivity
B19 Sungei Ingei/Gunung Mulu transboundary park
B20 Belait peat swamp forest transboundary connectivity
B21 Integrated management of Brunei Bay
B22 Combat wildlife crime
B23 Needs assessment for science-based management for CITES

SECTION 3 – STRATEGIES & INTERVENTIONS

Strategy 2

Tourism in the HoB shall be enhanced through development of niche nature tourism products and joint tourism promotion with the other Bornean countries. The scale of development shall take into account the environmental and cultural sensitivity of the areas being developed.

Strategic thrusts

3.3.2 Enhance regional tourism cooperation through HoB
3.3.3 Enhance nature tourism products
3.3.4 Develop niche tourism products

Interventions

T1 Formulate the National Ecotourism Masterplan
T2 Establish the Brunei Green Guide Programme
T3 Enhance local community participation in nature tourism
T4 Facilitate birdwatcher tourism
T5 Facilitate culinary tourism - The Hearty Food of Borneo
T6 Facilitate macro-photography tourism - Brunei in Close-up

Strategy 3

The development of non-renewable resources shall be carried out in a manner that imposes minimal impacts on the environment and protects the integrity of forest connectivity.

Strategic thrusts

3.4.2 Manage environmental impacts of sand extraction
3.4.3 Manage environmental impacts of onshore oil, gas and coal exploration

Interventions

R1 Develop measures to minimise the impacts of sand extraction

Strategy 4

Continuous environmental education and awareness, with focus on community outreach programmes, shall be promoted to ensure the sustainability of the HoB initiatives

Strategic thrusts

3.5.2 Develop HoB community outreach
3.5.3 Develop Environmental Education
3.5.4 Preserve Indigenous Knowledge

Interventions

E1 Develop the HoB national communications strategy
E2 Develop the HoB community reforestation programme
E3 Institutionalise Environmental Education at all levels of formal education
E4 Develop environmental awareness programmes for adults
E5 Establish the Brunei HOB Biodiversity field course
E6 Document indigenous knowledge

SECTION 3 – STRATEGIES & INTERVENTIONS

The four strategies provide a holistic approach to realisation of the HoB vision for Brunei. The strategies and strategic thrusts are not prioritised, as all the strategies are intended to be carried out in parallel. The interventions are however divided into three categories; each having a time span of three years :

Intervention category	**to commence in**
Short-term	2008
Medium-term	2011
Long-term	2014

SECTION 3 – STRATEGIES & INTERVENTIONS

This page has been left blank intentionally

3.2 Strategy 1 : The unique biological resources of the HoB shall be conserved and used with due consideration for the long-term sustainability of ecosystems, focusing on strengthening the protected area network, transboundary cooperation and improving management capacity.

3.2.1 Introduction

Borneo is undoubtedly one of the most important centres of biological diversity in the world. It holds biodiversity and endemism records for most plant and animal groups. The island is estimated to have about 15,000 plant species, including about 3,000 trees, 2,000 orchids and more than 50 carnivorous pitcher plants, as well as both claimants for the title of largest flower in the world – the Rafflesia and the Amorphophallus. The highest tree diversity recorded anywhere in the world – 1,175 species in a 52 ha plot – is found in Lambir Hills National Park, near Miri in Sarawak, closely rivaled by Andulau Forest Reserve in Brunei. The two sites are only about 50 km apart and lie on similar soils.

There are 44 endemic mammals on Borneo, 39 birds, at least 88 reptiles, more than 100 amphibians, and more than 160 fish – all of which are found nowhere else in the world. Given that about 36 new species are scientifically described every year, it is not surprising that biologists regard Borneo as one of the richest biodiversity hotspots on Earth.

Unfortunately, a high percentage of Bornean species are severely threatened. Like many tropical areas around the world, the natural forests of Kalimantan, Sabah and Sarawak are being cleared for commercial uses, added to which there is huge pressure from the illegal trade in wildlife, as logging trails and cleared forest give easy access to previously remote areas. There is little doubt that many species are going extinct even before they are discovered.

The full diversity of the forests of Borneo cannot be maintained if they are reduced to a patchwork. Reducing the habitat ranges of individual species leads to extinction and also causes genetic loss among smaller, isolated populations. Successful rainforest conservation requires the maintenance of very large blocks of inter-connected forest, without which hundreds, or even thousands, of species become extinct.

The Heart of Borneo is the only remaining place in Southeast Asia where the forests can be conserved on a truly large scale, reflecting the wealth of the biological treasures that they hold. Aside from the intrinsic value of flora and fauna for their own sake, they also represent massive reserves that may be measured in economic, scientific and social terms. The future of this area depends on the collaboration of all three countries, as no one of them can save the biological diversity of this unique area by acting alone.

The human pressures are relentless and the situation is urgent. Brunei is unique in that its forests have been much better conserved in relation to the size of the

country than is the case for Indonesia or Malaysia. However, this circumstance cannot be expected to continue without detailed planning and management, especially as the finite oil and gas reserves decline and the national economy becomes more diversified.

Biodiversity management requires national resolve, with appropriate legislation, policies and management. All these require institutional and human resource capacities. Currently, Brunei does not have sufficient of these capacities to do the job. This section looks at the specific issues involved and suggests steps needed to manage Brunei's biological diversity for the long-term national benefit.

3.2.2 Enhance biodiversity conservation

Responsibility for biodiversity management in Brunei Darussalam is shared between a number of agencies. In particular, the Museums Department via the Wild Life Protection Act 1978; Forestry Department via the Forest Act 1934, Fisheries Department via the Fisheries Enactment 1972; and the Agriculture Department, which is the national Management Authority for CITES.

Central to the protection of terrestrial wildlife is Wild Life Protection Act 1978, which contains provisions for the establishment of Wild life Sanctuaries and the protection of wildlife species listed in the Act (this list is being updated at present). The Negara Brunei Darussalam Master Plan (1987 – 2005) sought to replace this legislation through the introduction of the Wildlife Conservation Enactment, which would enable the establishment of a Parks and Conservation Department, and a system of Totally Protected Areas (National Parks, Wildlife Sanctuaries and Nature Reserves).

The HoB initiative is an opportunity to take a comprehensive look at national biodiversity management, including marine and freshwater species and habitats. Different countries use different divisions of authority in tackling this. While Brunei's neighbours tend to divide their wildlife authorities such that different agencies are involved in marine, freshwater and terrestrial management, there are examples of countries that take a more unified approach. (e.g., the USA has the Fish & Wildlife Service; francophone African countries typically have Water & Forests conservation agencies, etc.)

Biodiversity management in Brunei Darussalam currently suffers from a lack of specialised human resources and those that are available are fragmented between the various agencies. In addition, zoology as a science is almost entirely restricted to UBD and its overseas partners. There is an almost complete dearth of field zoologists in Brunei.

This has led to the current situation of a lack of survey and inventory information, uncontrolled hunting (traditional, recreational and commercial), some forests that obviously lack wildlife, and almost non-existent wildlife-based tourism. On the other hand, the forest habitats have been excellently mapped under the Brunei Forest Resources and Strategic Planning Study of 1984.

Brunei's priorities for national biodiversity management need to be assessed so that an appropriate management structure can be put in place, preferably without being bound by the remits and practices of the current wildlife management agencies.

Interventions
B1 Enhance legal and management framework for biodiversity conservation
B2 Develop institutional capacity for biodiversity conservation

3.2.3 Improve understanding of biodiversity

Biodiversity research in Brunei is undertaken mainly by the department of biology of Universiti Brunei Darussalam (UBD) and the Natural History Section (Wildlife) of the Museums Department. The Brunei Rainforest Project in 1991-1992, jointly organised by UBD and the Royal Geographical Society saw some 50 scientists from eight countries undertaking over 33 short-term and nine long-term projects in the Batu Apoi Forest Reserve, including inventories of mammals, ants, termites, bats, birds, beetles, frogs, river fauna, trees, ferns, rattans as well as the ethnobotany of forest plants. This project represented a milestone in biodiversity research in the country, as it facilitated the establishment of the Kuala Belalong Field Studies Centre, and coincided with the declaration of Brunei's first and largest national park, i.e. the Temburong National Park, by the Forestry Department.

Brunei's forests contain among the highest tree diversities in the world. A Tree Flora project, supported by UBD Forestry Department and BSP, is currently being carried out. As such, Brunei is perfectly placed to be at the forefront of tree/forest diversity research. Among the countless questions to be unraveled are: Why do tropical forests have high species diversity? How can that high diversity be maintained under conditions of human use? What role do tropical forests play in stabilizing our climate and atmosphere? How can we take advantage of and enhance their ability to store carbon? What determines tropical forests productivity? How can we utilize forests resources sustainably? Many such fundamental questions concerning tropical forests are best addressed by a comparative approach involving long-term, individual-based, mapped, permanent forest plots.

Reliable information on wildlife and habitats is fundamental for designing management and protection strategies. So far, the information on current wildlife distributions is patchy, not only for the smaller and more cryptic species, such as invertebrates, amphibians, reptiles and small mammals, but also for large mammals and birds. It is a reasonable assumption that Brunei's natural complement of wildlife should include much of the same array as in neighbouring parts of Borneo, but this is not necessarily the case. For example, Banteng (wild cattle) might still exist south of Tasik Merimbun in Tutong and Belait Districts, whereas they are considered to be extinct in Sarawak. On the other hand, Orang-utans are believed to be extinct in Brunei although they occur as nearby as Sabah's Crocker Range.

In addition to the lack of survey information on known Bornean species, there are many so far unrecorded species waiting to be discovered. Over the ten-year period between 1994 and 2004, at least 361 new species have been recorded on Borneo, ranging from dwarf tree frogs and blind lizards to orchids and fish. It is not only the small animals that are being discovered. The yellow barking-deer was only recognised as a separate species, exclusive to Borneo, living alongside the more

common Asian red barking-deer, in 1982; and Borneo's unique pygmy elephants were only recognised scientifically in 2003. It would be extraordinary if faunal surveys of Brunei did not yield at least dozens of new species.

In parallel to strategic thrust 3.2.2, initial steps can be taken towards comprehensive surveys of the country's fauna. Arbitrary decisions are needed as to which species to survey first. It would be practical to start such surveys focussing on species that are already of interest to experts in Brunei, as follows:

Cats

The following wild cats all may occur in Brunei and may be in danger of extinction: the Borneo clouded leopard, the bay cat, the flat-headed cat and the marbled cat. Currently no systematic information exists as to their abundance and distribution. Information is based on hearsay.

The Borneo clouded leopard, which has recently been identified as being a separate species from its cousin on the Asian mainland, is Borneo's largest predator. It may be in danger of extinction in Brunei, together with any or all of the other cats.

There is also no information as to what extent illegal hunting, poaching and 'traditional hunting' play a part in cat survival, movements and range.

Since UBD has the relevant expertise, it can lead cat surveys by employing camera traps and radio-telemetry. Cat surveys will inevitably yield useful survey information on other mammals from the camera traps and incidental observations.

Amphibians

Brunei is a world class (but little known) biodiversity hotspot for amphibians (mainly frogs). Ulu Temburong alone contains at least 60% of known lowland and hill amphibian fauna of Borneo. There is at least one frog species that is unknown outside Brunei. All this is because the habitats are transitional, where the eastern Sarawak hill forests meet the Borneo lowlands.

In addition, Ulu Temburong provides a rich variety of breeding sites, such as streams, waterfalls, forest canopy, etc., all of which are used by various species, including many that are highly specialized. Crucially, these habitats have been well protected in Ulu Temburong National Park.

Ulu Temburong therefore provides an opportunity to launch a nationwide amphibian survey by generating baseline information that can be used for rapid surveys elsewhere. The data generated would also contribute to the management of the National Park. UBD has the relevant expertise to lead this work.

SECTION 3 – STRATEGIES & INTERVENTIONS

Insects

Insects comprise the majority of the biodiversity of rainforests. They have a massive influence on our environment as pollinators, predators, prey, soil conditioners, etc. Most biodiversity inventories, however, tend to concentrate on vertebrates and, as a result, there is a paucity of knowledge on the insects and other invertebrates that can be found in all strata of the rainforest and in all habitats. This is a gap that needs to be filled to provide a realistic picture of national biodiversity.

The array of insects is so vast that focusing would be needed, for example, on selected groups for which at least some background data (e.g. distribution) are already available from Borneo: e.g., ants, moths and cicadas, which are relatively easy to survey. UBD has the relevant expertise to lead this work.

In addition, there are hearsay reports of large mammals (e.g., banteng or wild cattle, that are generally regarded to be extinct in Brunei) in the inter-riverine zone south of Tasik Merimbun in Tutong and Belait Districts that is currently zoned for plantation forestry. It is crucial to investigate this before converting the natural forest there to plantations.

Fish and Other Aquatic Fauna

In general, there is little information available on the physical, chemical and biological characteristics of rivers in Brunei. The Tutong river study, commissioned by the Department of Environment, Parks and Recreation (DEPR) in 2004 is the most comprehensive river study to date. The baseline information and recommendations from this study have been useful to DEPR for planning, among other things, water quality monitoring regimes and pollution source reduction programmes in the Tutong river catchment. Similar studies are planned in for the Belait and Temburong rivers.

In terms of biodiversity, UBD and the Museums Department have previously conducted fish surveys, mainly in Tasik Merimbun, and Temburong National Park. However, there is still a need for further surveys, with the discovery of new species being very possible in the rivers and wetlands of Brunei. This is especially so in the fast-flowing streams in the headwaters of catchments and in the peat swamps, where the aquatic biodiversity or number of endemics is expected to be greatest. Incidentally, these areas also tend to be the least studied, owing to the difficulties in reaching them.

Interventions

B3 Establish the Brunei HoB 25 ha permanent forest dynamics research plot
B4 Survey of endangered cats in Brunei
B5 Survey of amphibians in Brunei
B6 Survey of insect biodiversity in Brunei
B7 Large mammal survey in the Inter-riverine Zone
B8 Survey of fish and aquatic invertebrates in Brunei

3.2.4 Strengthen the Protected Areas system

National Coverage

Brunei is well forested with little pressure to clear natural habitats (Figure 3-1). Legal protection of forest habitats is afforded through a number of different laws, foremost being the Forest Act 1934. One loophole in this Act is that while it allows for the constitution of forest reserves, it does not provide for the gazettement of "protected" classes of forest reserves. Although the National Forestry Policy of Brunei Darussalam does specify five categories within the National Forest Estate, i.e. Protection Forests, Production Forests, Recreational Forests, Conservation Forests and National Parks, these remain as administrative categories without legal standing. It is expected that this will be rectified with the gazettement of the Forest Act (Amendment) Order 2007.

Although the Wild Life Protection Act 1978 does provide for the establishment of Wildlife Sanctuaries, this provision has never been used. Tasik Merimbun, which is managed by the Museums Department, is not a gazetted protected area under Brunei legislation, although it has been declared as an ASEAN Heritage Park under the ASEAN Declaration on Heritage Parks. Pulau Siarau, which is an important site for wildlife conservation is gazetted under the Antiquities and Treasure Trove Act 1967, although the general purpose of this act is to provide for the control and preservation of historical monuments, archaeological sites and antiquities.

On the whole, the present protected area (PA) system of forest reserves (various protection categories) and parks does not encompass all of the critical habitats. In particular, the Belait peat swamp forest is not included in the PA system, nor are patches of threatened Kerangas forest in the Tutong district.

Furthermore, the functions of PAs as biodiversity conservation areas have not been evaluated. There is no up-to-date survey information to provide forest conservation inputs to overall national land-use planning, in terms of representative habitats and the distribution of wild flora and fauna. The latest remote sensing information on habitats needs to be ground-truthed and studied in relation to data from faunal surveys that, for the most part have not yet been carried out. The results of such work could then be compared against the locations of PAs, and a gap analysis would lead to recommendations for the revision PA boundaries and the creation of new PAs (taking account of other, possibly competing, land-uses).

Peat swamp forests

Peat swamp forests dominated by even-crowned stands of *Shorea albida* (locally known as *Alan*) are unique to the northern coast of Borneo. This habitat extends from Batang Lupar in Sarawak to Sungai Tutong in Brunei Darussalam, of which the most extensive and well preserved block is found in Brunei, within the western part of Belait District. Estimated at around 70,000 ha in size, the Belait peat swamp forest is of particularly high conservation value due to its role in regulating water supply for domestic and industrial use in the coastal area, the unique and rare habitats it contains, the wildlife it supports (including the Borneo clouded leopard), and not least in its function as an enormous carbon sink of global importance (Figure 3-1).

SECTION 3 – STRATEGIES & INTERVENTIONS

However, the present status and management of this important forest complex does not reflect its importance. The bulk of the complex is on Stateland, making it vulnerable to conversion to other land use. Logging is on-going. Although the Forestry Department has taken various measures to effectively minimise its impact on the integrity of the peat swamp complex (most importantly by ensuring minimal draining of the water table), logging does take a seemingly irreparable toll on the unique *S. albida* forests. It has been found that *S. albida* does not regenerate in logged over forests, which therefore become dominated by a mix of other associated peat swamp species. Kobayashi (1998) reported that when *S. albida* blossomed in February 1986 in Brunei and Sarawak, the seedling population almost disappeared from the forest floor within a span of two years. Since then, there has not been a single fruiting year for *S. albida* in Brunei. Previous reforestation trials in the Belait peat swamp forest are said to have been unsuccessful. Due to the above phenomena, if the current logging practices are sustained, three things are likely to happen. These are a loss of the unique pure *S. albida* stands, a loss of genetic variability, and the eventual extinction of the species.

It should be noted however, that the entire peat swamp forest is not homogenous, but may be categorised into five main sub-types, occurring in a sequence from the perimeter to the centre of individual blocks (with each block being generally divided by tributaries of the Belait river):

- Transition between mangrove and Peat swamp forest
- Mixed swamp forest
- Alan (*Shorea albida*) forest (further divided into four sub-types)
- Mixed padang forest
- Padang keruntum forest

In their most perfectly formed state, these swamps grow into a unique formation, shaped like a convex lens with the deepest peat in the middle, where the padang keruntum forest forms a natural clearing of open savannah woodland with stunted trees.

The Ulu Mendaram Conservation Area contains Brunei's only example of such a fully-formed peatswamp lens. Apart from this site, which is located in the least accessible southwest portion of the habitat, the rest of the complex is unprotected Stateland forest, subject to a host of pressures including clear felling, logging, sand mining and urban development. The area designated as a Forest Reserve for Research has been razed by fire.

While the irreversible damage that logging contributes to the unique *S. albida* forests would call for the phasing out of logging operations in the long term (preferably at the end of existing concession periods), the Belait peat swamp forest complex should be managed as a contiguous system, in order to maintain the full range of its bio-physical values, in particular the maintenance of its hydrological functions, the conservation of the unique Alan forests, and its viability both as a habitat for plants and animals, and as a carbon sink.

Kerangas (Heath) forests

Kerangas forests – the name is an Iban term for places where rice cannot be grown – are mainly found on infertile, base-poor, highly acidic, predominantly sandy soils. By 1984, the Forest Resources and Strategic Planning Study showed that at least 55% of these forests had been degraded or destroyed, leaving about 3,455 ha on the ancient white-sand terraces along the coast, as well as on some sandy ridges further inland (Figure 3-1).

This forest type, which has its own characteristic assemblage of plants and animals, is poorly represented in Conservation Forest Reserves and is particularly vulnerable to fire. It would therefore be advisable to locate the best remaining examples and conserve them under PA status. In addition, due to the small size and vulnerability of kerangas patches, efforts should be made to rehabilitate (if possible) and enrich (where applicable) burnt over areas and remnants of these forests using native species to restore the natural biodiversity.

Brunei Bay

Brunei Bay, which is located in the northern part of the HoB area within Temburong District, harbours much of the country's most important coastal wetlands. The bay is large and shallow, and extends over 2,500 km^2, beyond Brunei's waters to the coasts of Labuan, Sarawak and Sabah. Due to the complex coastal processes, the bay it is vulnerable to the impacts of coastal and inland land use both in Brunei Muara and Limbang in Sarawak. Human access is very easy and difficult to monitor due to the complex maze of islands and channels, some of which shift over time.

The Brunei portion is a shallow estuarine complex of mangrove swamps, mudflats and tidal channels, fed by several rivers. Within this, the mangroves form a largely intact forest complex, whereas those within the adjacent Sarawak territory have been partly clear-felled to supply the wood-chip industry. Brunei's part of the bay receives high silt loads (principally from the Limbang and Temburong Rivers), urban pollution (principally from the Brunei and Limbang Rivers) plus peat and woody debris (principally from Temburong's peatswamps).

This study recommends that Temburong's mangroves be included in the HoB area, with total protection for Selirong and Siarau Islands.

In addition, it would be mutually beneficial to both Brunei and Malaysia to integrate the management of the bay's natural resources on a rational and sustained basis (Caldecott, 1987). This is a matter that can either be taken up by Brunei as a national issue, at least initially, or as a bilateral issue under HoB. The latter is preferable as almost everything that needs to be managed has an international aspect. See section 3.2.8.

Management

There are two key aspects to the effective management of PAs. First, is the creation of the plan, based on available data and the overall objectives of the PA. Second, is the implementation of the plan, which requires a legal and policy framework, a management authority and a management team for the PA itself.

Given the need for an integrated solution to nationwide wildlife management needs and the need for protected areas management, one option would be to create a Department of Biodiversity Protection and National Parks to bring together the skills and operations of these two closely-related and overlapping fields (See Intervention B1). This department would have responsibility for nationwide protection for wild fauna and flora, hence the term "biodiversity" rather than "wildlife" which is usually taken to mean terrestrial animals. It would also be the planning and management agency for PAs that are established for the protection of natural habitats and their use for such purposes as species conservation, scientific research, protection of unique geological features and ecotourism.

While these PAs might well have additional values, such as water catchment protection, recreational amenities and cultural conservation, they would be different from Protection Forest Reserves that are established for primarily for catchment protection and from parks in less natural areas that are established primarily as local amenities. There would a need to define the roles of the Environment and Parks Department, the Forestry Department, the Museums Department and the proposed Biodiversity Protection and National Parks Department at the outset.

Interventions

B9 Rapid assessment of the Protected Area System
B10 Gazette Belait Peat Swamp Complex as a Forest Reserve, and extend Ulu Mendaram Conservation Area
B11 Formulate a management plan for the Belait peat swamp forest
B12 Capacity-building and preparation of a national action plan for the wise use of peatlands and reduction of fire risk
B13 Conservation surveys and management of Kerangas forests

3.2.5 Forestry and biodiversity

Economic forestry

While economic forestry in Brunei is well planned and managed, there is still scope for improvement in terms of formally integrating biodiversity considerations into the existing framework.

The Forest Resources and Strategic Planning Study (1984) predicted an acute timber deficit by 2015, when the Mixed Dipterocarp Forests (MDF), the country's main source of timber supply, would be completely logged-over. To avert this, the Forestry Department halved the annual allowable cut from 200,000 m^3 to 100,000 m^3 per annum starting from 1990. This is predicted to delay the deficit to 2045.

At the same time, the Forestry Department also began the sawntimber plantation development programme with the objective of developing 30,000 ha of plantations within the Inter-riverine Zone (IRZ - the area between Belait and Tutong rivers), at a rate of 1,000 ha per year (Figure 3-2). It is predicted that at maturity the sawntimber plantations would yield about 200,000 m^3 per annum, more of less equivalent to the annual demand of the local timber industry. This study recommends that the 30,000 ha target set for plantation forests should be re-examined, in light of the original estimate that 10,000 ha would be sufficient to meet local demand, as well as to

reconcile with need to conserve existing high conservation value forests in the IRZ (See also Table 2-1.)

The first-generation plantation species, *Acacia mangium* and Caribbean Pine (*Pinus caribea* var*. hondurensis*) were found to have little or no value in supporting wildlife populations. While the Forestry Department since has moved away from these species for various reasons, the value of plantation forests as wildlife habitats is still low. As this is a general issue in plantation forestry throughout the tropics, it may be seen as an opportunity for Brunei to lead the way in wildlife-friendly forest plantation design. This should encompass improving the value of plantation forests as habitats through incorporating wildlife requirements into design at landscape, habitat and site levels, for example:

- By leaving known fruit trees standing;
- By incorporating Virgin Jungle Reserves/conservation areas/small breaks within the plantation mosaic, especially in sites where these can function as wildlife reservoirs and corridors between larger blocks of natural forest; and,
- By conserving natural vegetation in riparian strips along watercourses.

In order to facilitate the evaluation of forest plantations as wildlife habitats, representative large mammal surveys should be conducted of existing plantations and areas within Inter-riverine Zone that are scheduled for conversion to sawntimber plantations, with particular emphasis on those areas where forests are still in relatively good condition (Intervention B7). This will provide baseline information that can be used in specific EIAs.

Interventions
B14 Develop EIA process for the HoB area

3.2.6 Develop the framework for bio-prospecting

Bio-prospecting for new pharmaceutical and agricultural agents has been a productive enterprise since the early 1990's. It is the foundation of all biotechnology. Biologically derived compounds occur in more than 50% of common prescription drugs. More than 60% of anti-cancer and anti-infective agents developed between 1984 and 1995 were of natural origin. The value of global trade in plant-based pharmaceuticals in 1991 is estimated at around US$150-120 billion. This results in the continuing industrial interest in finding new biological compounds from almost the entire range of life forms, and in every corner of the world. Many, if not most, new drugs and new genes from natural products come from biodiversity-rich developing countries. Despite this commercial interest, these nations have limited involvement in such research due to their lack of technical capacities.

In 1992, MIPR requested the Industrial Development Unit of the Commonwealth Secretariat for technical co-operation to undertake a survey and study on medicinal and aromatic plants for potential drug development and commercialization. The technical team listed relevant plants and generated a plan for the establishment of

facilities needed to support a bio-prospecting programme. There are several factors which may contribute to the prolonged delay in the implementation of this plan. One is the large monetary investment required and second is the realization of the time that it will take before any revenue or profit can be made from such a venture.

Alternative approaches have been considered, mainly in the form of projects submitted by pharmaceutical companies overseas to screen Brunei's plants for potential drugs. However, these proposals have generated serious concerns about one-sided, exploitative agreements which would not protect Brunei's long term interests in such matters as financial returns, protection of copyrights and capacity building. Brunei needs to protect itself from exposure to such adverse developments before entering into agreements with external partners.

In addition to the above, there are other concerns that need to be addressed urgently. The most important is the lack of laws governing bio-technological research and development in Brunei. Such legislation is crucial for the proper conduct of any research involving natural resources of the country. Otherwise the resources in question can be misappropriated, exploited and used freely without the authorization of the source country.

Currently, the flora and fauna of Brunei remain largely unexplored and not utilized for the benefit of the country. However, if properly investigated and used they can be the source of massive revenues in the years to come. The opportunities are therefore limitless provided a properly structured, systematic and scientific approach is used.

Thus, Brunei should establish an integrated programme for the discovery of biologically active terrestrial and aquatic flora and fauna for drug development and biodiversity conservation. At the same time, it is important to ensure that local communities and the nation as a whole derive maximum benefits from their biological resources and intellectual contributions.

At present, Brunei lacks the capacity to properly assess such bio-prospecting proposals as come up from time to time. Therefore, the opportunity to benefit from this sector while sustainably managing the HoB forests is being missed.

Capacity building is needed to support the research and conservation efforts of the overall bio-prospecting project by building laboratory infrastructure and information-handling capabilities, and by promoting exchange of resources, information and ideas through formal links between collaborating institutions.

Interventions

B15 Generate legislation for biotechnology, including bio-prospecting
B16 Establish national Bio-prospecting Programme

3.2.7 Offsets and Payments for Ecosystem Services

The economic value of the world's natural ecosystems is increasingly recognised by scientists and policymakers. These economic benefits that nature provides free of charge to humanity are called ecosystem services. Examples include hydrological services, soil stabilization, pollination, and carbon sequestration. The value, however, of most of these ecosystem goods and services does not pass directly through existing markets. Nevertheless they still have tangible economic value, and in the last few decades economic techniques to calculate these values have been developed and refined.

Conservation values are beginning to inform consumer and investor decisions. Eco-labeling schemes have been devised to certify that products are produced in ways that are consistent with sustainable environmental management. e.g., timber certification. In various ways, ecosystem services are forming the basis of new markets and payment schemes for conservation, creating a new asset class of ecological products. Eco products include carbon credits from forestry and land management, endangered species banks, wetland banks, water quality credits and other cutting-edge instruments for environmental transactions. The global carbon credit market nearly tripled between 2005 and 2006 to trade over US$30 billion globally. Given that the three biggest environmental challenges of the 21st century are climate change, the declining availability of fresh water and the loss of biodiversity, it is inevitable that increasing value will be put on compensating for these trends. The underlying ecological assets will become more valuable and investors will want to capitalise on the trend.

In proportion to its land area, Brunei contains a major carbon sink in its forests, especially the peatswamps which also double as wetland banks. The Task Force did not analyse the carbon credit market in relation to Brunei, but it seems likely that the country is in a strong position to profit. Many, if not most, rainforest countries face economic and population pressures that will have to be overcome in order to create confidence that those nations that want to trade their sequestrated carbon as offsets can really maintain the sequestration. Brunei, with its lack of land-pressure, economic and political stability, and outstanding track record in forest conservation could surely both trade *per se* in carbon offsets and also play a global role as a model of carbon sequestration in tropical forests. The latter role might attract technical co-operation and investment from governments and agencies. It is recommended that this be investigated.

Biodiversity conservation is also emerging as a tradable right, particularly in the US. In this case, where land-use changes cause negative impacts on ecosystems or species, developers may be required to offset the impacts by some mix of protecting habitat elsewhere or re-creation of similar habitat. In response to the increasing demand for these offsets, a biodiversity banking industry is emerging that will buy up properties and develop them for particular types of habitat in demand in the region, such as ponds, particular vegetation types or riparian zones.

While this localized biodiversity banking and trading does little for habitats in the developing world, the seed has been sown. There is an increasing interest in how the concept may be applied to emerging markets, particularly in relation to rainforest conservation. As carbon markets have grown, interest has turned to

rainforest conservation as a component of the global carbon market. Avoided deforestation is an important issue that governments have to deal with, often as a result of public demand either at home or in the countries in which they market their products. For example, the agribusiness sector is also coming under increased scrutiny for ecological side-effects, such as land clearing for oil palm. Deforestation destroys species, so while the climate change benefits are taking the highest profile in the global media, biodiversity is already a central driver for efforts to conserve forests. Investors are known to be considering projects that create conservation banks as the basis for selling offsets based on biodiversity impacts. For example, an Australian company has been working with clients in Africa and Southeast Asia on projects that seek to develop these concepts and demonstrate that intact tropical rainforests could become assets in their own right for both carbon and biodiversity benefits. The idea is that the model could provide sustainable revenue streams through annuity payments for forestry preservation and maintenance.

As recently as 26th November 2007, the Government of Sabah signed an MoU with one such company, New Forests Pty Limited of Australia, regarding the joint development of a wildlife habitat conservation bank to be implemented in a forest reserve comprising 34,000 ha of prime wildlife habitat. This is the first such agreement for Sabah and is probably the first on Borneo. It is a pioneering initiative and should be of interest to Brunei. The same reasons that are mentioned above as creating confidence in Brunei as a location for carbon sequestration, would apply to Brunei as a location for secure biodiversity sequestration. While this market is currently in its infancy, Brunei should quickly develop an understanding of its potential and follow-up as appropriate.

Intervention
B17 Study potential of carbon and biodiversity offsets

3.2.8 Cross-border issues and co-operation

There are several areas where Brunei's biodiversity management would benefit from transboundary co-operation.

Production forests, protected areas, wildlife management and the coastal zone would all benefit from:

- Bilateral agreements with Malaysia/Sarawak on joint boundary patrolling and rights of hot pursuit;
- Cross-border joining of forest reserves and PAs to maximise forest contiguity and area/perimeter ratios;
- The integrated management of Brunei Bay's natural resources; and,
- Bilateral proposals for technical aid, to make stronger cases for support.

PA management would benefit from:

SECTION 3 – STRATEGIES & INTERVENTIONS

- Cross-border buffering of PAs on one side with production forest on the other; and,

- Cross-border tourism.

Species conservation would benefit from:

- Management of cross border smuggling, both through customs checkpoints and elsewhere along the entire border, using both the CITES framework and protocols for bilateral and trilateral co-operation which can be established;

- Scientific co-operation, through exchanges, joint expeditions, networking and working out complementary, rather than competing, roles for institutions of research and learning (such as universities, field centres, national HoB centres, etc.);

- Capacity building through training attachments; and,

- Bilateral and trilateral proposals for technical aid, to make stronger cases for support.

Interventions

B18 Ulu Temburong National Park transboundary connectivity
B19 Sungei Ingei/Gunung Mulu transboundary park
B20 Belait peat swamp forest transboundary connectivity
B21 Integrated management of Brunei Bay
B22 Combat wildlife crime
B23 Needs assessment for science-based management for CITES

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B1	**Enhance legal and management framework for biodiversity conservation**
Strategic thrust	3.2.2
Time frame	Short term
Lead agency	MIPR
Project partners	• Museums Department • Forestry Department • Agriculture Department • Environment, Parks and Recreation Department • Fisheries Department • Marine Department • Attorney General's Chambers • Universiti Brunei Darussalam

Benefit(s)

1. Updated and comprehensive wildlife and habitat protection laws
2. Effective administrative structure in place

Description

Rationale

Brunei does not have a department that is dedicated to, and properly equipped for, the conservation of wildlife and other biodiversity, plus the management of national parks and sanctuaries. The various responsibilities are shared between a number of different departments, mandated though a number of different legislation. This situation needs to be studied in detail in order to identify and subsequently develop a suitable legal and management framework for the country.

Scope

1. Assess the effectiveness of existing legal and management framework for biodiversity (terrestrial and marine) conservation and management.
2. Revisit the recommendation in the Negara Brunei Darussalam Master Plan (1987 – 2005) for the introduction of the Wildlife Conservation Enactment to replace the existing Wild Life Protection Act 1978.
3. Streamline/revamp the existing legal and administrative framework as appropriate.
4. Establish new legislation and department for biodiversity protection if required.

Given the need for an integrated solution to nationwide wildlife management needs and the need for protected areas management, one option would be to create a Department of Biodiversity Protection and National Parks to bring together the skills and operations of these two closely-related and overlapping fields. This department would have responsibility for nationwide protection for wild fauna and flora, hence the term "biodiversity" rather than "wildlife" which is usually taken to mean terrestrial animals. It would also be the planning and management agency for PAs that are established for the protection of natural habitats and their use for such purposes as species conservation, scientific research, protection of unique geological features and ecotourism.

Cost : B$ 250,000 (short-term consultancy)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B2	**Develop institutional capacity for biodiversity conservation**
Strategic thrust	3.2.2
Time frame	Medium term
Lead agency	MIPR
Project partners	• Museums Department • Forestry Department • Agriculture Department • Environment, Parks and Recreation Department • Fisheries Department • Marine Department • Universiti Brunei Darussalam
Benefit(s)	
1. Agencies strengthened or created to manage wildlife and habitats and enforce the law	
Description	
Rationale There is a lack of expertise in Brunei within the specialised fields in biodiversity management e.g. zoologists, botanists, biochemists, protected area managers. The Museums Department, which is charged with protection of terrestrial wildlife, suffers a lack human resource to enable it to effectively carry out its work. **Scope** • Identify human resource requirements for various departments. • Address UBD and other sources of professional and technical staff so that available young people with the right aptitudes are encouraged to join the new or revamped wildlife protection agency as soon as possible. The sourcing of overseas talent may also need to be considered as an interim measure.	
Cost : B$ 500,000 (developing training modules, conducting training, toolkits and study tours)	

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B3	**Establish the Brunei HoB 25 ha permanent forest dynamics research plot**
Strategic thrust	3.2.3
Time frame	Medium term
Lead agency	UBD
Project partners	• Centre for Tropical Forest Science (CTFS) of the Smithsonian Tropical Research Centre (STRI) & Harvard University – International Collaborator & Advisor • Forestry Department – Local Facilitator

Benefits

1. Generate local and international interest in long term studies of Brunei's forest and biodiversity
2. Form part of global CTFS network which will put Brunei at international forefront in research together with other 14 CTFS partner countries (i.e. 2 Africa, 7 Asia & 5 Latin America).
3. Showcase Brunei's scientific support for HoB

Description

Rationale

Brunei's forests contain among the highest tree diversities in the world. As such, Brunei is perfectly placed to be at the forefront of tree/forest diversity research. The objective of this proposal is to increase research field facility in Brunei Darussalam for long term studies of its tropical rain forests. The creation of this large plot will enhance the value of Kuala Belalong Field Study Centre (KBFSC) as a research station. It will provide opportunities for local and international scientists to conduct research, and unparalleled opportunities for the education and training of students. Information gathered will be useful for relevant forest management and policy decisions. Furthermore, the plot will also generate research interest in other scientific areas.

These points are scientifically critical and are likely to result in strong scientific support for the proposal. It should be noted that CTFS is a highly respected, global leader in this field of research.

Scope

Assuming that all the required manpower is provided, the duration in the setting up and complete enumeration of all the trees shall be around 2-3 years. The methodology will follow standard procedure prescribed by CTFS to ensure that it is comparable to the other CTFS plots worldwide. This involves marking, measuring, plotting and identifying every tree of one cm diameter at breast height and above in the 25 ha plot. An initial tree census and periodic follow-up censuses will yield long term information on species growth, mortality, regeneration, distribution, and productivity.

Cost : B$ 300,000 (establishment of plots, field assistants, equipment, logistics)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B4	**Survey of endangered cats in Brunei**
Strategic thrust	3.2.3
Time frame	Short term
Lead agency	UBD
Project Partners	• Museums Department • Forestry Department

Benefits

1. Data vital for the conservation and management of cats and their habitats in Brunei
2. Data relevant to CITES on issues of poaching/trafficking of these and other species
3. Data relevant to the establishment of protected areas and management of buffer zones, etc.
4. Advanced scientific training in field biology to UBD students to address the acute national shortage of field biologists.

Description

Rationale

Currently no systematic information exists as to the abundance and distribution of clouded leopards and other wild cats in Brunei. Data are needed on their numbers, range, habitat use, hunting pressures, etc.

Scope

This project will use expertise available in UBD and the Brunei Museum, as well as overseas experts, to assess the current status of Brunei's wild felines by employing camera traps and radio-telemetry. Local graduate and post graduate students should be employed.

Cost : B$ 300,000 (field equipment and research assistants, logistics)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B5	**Survey of amphibians in Brunei**
Strategic thrust	3.2.3
Time frame	Medium term
Lead Agency	UBD
Project Partners	• Museums Department • Forestry Department

Benefits

1. Data vital for the conservation and management of amphibians and their habitats in Brunei The results will have bearing on CITES on issues of poaching/trafficking/export of these species
2. Advanced scientific training in field biology for UBD students, helping to address the acute national shortage of field biologists.

Description

Rationale

This project will help to address the national shortage of wildlife survey information. Amphibians, especially frogs, appear to especially vulnerable both to specific habitat degradation and climate change.

Even in protected areas, they may be endangered because amphibian breeding sites (for example) can be very restricted and easily impacted even by otherwise benign developments that are deemed to be necessary for park management and tourism.

The results of this work will provide important scientific information and contribute to the prestige of the park and the country. They can also help to provide an additional attraction in the National Park for specialized, niche ecotourism.

Scope

The project would first focus on Ulu Temburong to generate detailed information that can then be applied to nationwide survey techniques. Ulu Temburong is a world class biodiversity hotspot for amphibians (mainly frogs). Specifically, it contains at least 60% of known lowland and hill amphibian fauna of Borneo. There is at least one frog species that is unknown outside Brunei.

In addition, Ulu Temburong provides a rich variety of breeding sites, such as streams, waterfalls, forest canopy, etc., all of which are used by various species, including many that are highly specialized. This rich environment is likely to yield similarly high diversities of other types of animals, but they have not yet been studied in detail. A study of the frogs and other amphibians would be a logical place to start.

This project hopes to use the expertise available in UBD and the Brunei Museum as well as foreign expertise. Local graduate and post graduate students should be employed.

Cost : B$ 150,000 (field equipment, research assistants, logistics)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B6	**Survey of insect biodiversity in Brunei**
Strategic thrust	3.2.3
Time frame	Medium term
Lead agency	UBD
Project partners	• University of Landau (Germany) • University of Basle (Switzerland) • British National History Museum (UK)

Benefits

1. Identification of new species of insects in Brunei.
2. Data on insect habitat requirements, vital for the planning of core protection areas within the HoB area.
3. Data for the IUCN red listing of insects that is so far neglected.
4. Advanced scientific training in field biology to UBD students
5. Information that can be used in niche tourism planning (e.g., butterflies, macro-photography)

Description

Rationale

In spite of the huge numbers and array of invertebrates in Brunei's forests, and their significance for forest ecology, agriculture, biotechnology, etc., they are little studied and virtually not inventoried. This project will address this gap by focusing on three insects groups for which at least some background data are already available from Borneo: ants, moths and cicadas.

Scope

This intervention focuses on three insects groups for which at least some background data (e.g. distribution) are already available from Borneo: ants, moths and cicadas. The studies on ants so far demonstrated a zonation along mountains and clear stratification within the forest. It was also noted that logging and landscape fragmentation reduced diversity and affected gene flow between populations. The methodology to assess ant biodiversity is well established and pictorial web based keys exist on the internet which guarantee quick knowledge transfer and allows the involvement of many institutions. With an Asian ant group (ANeT) existing and the possibility of making this a key IUCN ant project the group is well suited to address open questions on beta diversity on Borneo.

Several moth groups have in the past been used successfully to analyze effects of habitat variation on assemblages of tropical herbivore insects and their spatial structuring. Large data sets of quantitative samples for some families are already available to us and form an excellent basis for further, conservation-related studies.

Cicadas are, unlike many Lepidoptera, very poor dispersers. In the past, high levels of endemism were shown in other parts of the Southeast Asia, making this taxon suitable to uncover fine-scale patterns of habitat isolation. A large fraction of these insects can be attracted to artificial light sources (similar to most moths), allowing relatively easy faunal surveys.

The research approach will be twofold - analysis of the available data on species distributions (including museum collections, in combination with GIS modeling), and field sampling in those regions proposed to be included in the HoB initiative.

Cost : B$ 150,000 (field equipment and research assistants)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B7	**Large mammal survey in the Inter-riverine Zone**
Strategic thrust	3.2.3 & 3.2.5
Time frame	Short to medium term
Lead agency	Universiti Brunei Darussalam
Project partners	• Forestry Department • Museums Department • Overseas experts, NGOs, etc.

Benefits

1. Inventories on the larger mammals in the forests south of Tasik Merimbun
2. Habitat-use data that may be applied to plantation forest planning and management to mitigate the impacts of plantations on the local wildlife

Description

Rationale

Brunei is thought to lack the biggest mammals on Borneo, such as elephant, rhinoceros, banteng and orang-utan. Banteng are of very limited distribution on Borneo, very vulnerable to hunting and generally thought to have gone extinct in Brunei during the 20th century. Given that the Museums Dept is aware of hearsay reports of their presence in the Inter-riverine Zone that is proposed for conversion to plantations (See Figure 3-2), it is crucial to investigate so that the decisions on conversion can be made in the light of appropriate information, not just on banteng, but on larger mammals generally.

Scope

The survey techniques have yet to be designed. They would need to cover representative examples of all the habitat types in the area, as well as following up on hearsay information and local knowledge. Strip surveys would be appropriate, either by a small team working over a two-year period, or by many teams working concurrently. There are pros an cons of both options, but the latter, which no doubt requires more organisation, lends itself to being a spectacular opportunity that can bring in experts at relatively low cost if scheduled during university vacations.

Cost : B$ 200,000 (field equipment, logistics and research assistants - some of the equipment purchased in Intervention B4 may be utilised)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B8	**Survey of fish and aquatic invertebrates in Brunei**
Strategic thrust	3.2.3
Time frame	Medium term
Lead agency	Universiti Brunei Darussalam
Project partners	• Museums Department • Overseas experts, NGOs etc

Benefits

1. Identification of new species of fishes and aquatic invertebrates.
2. Identification and description of important aquatic habitats, vital for the planning of core protection areas within the HoB area.
3. Data for the IUCN red listing of fishes and aquatic invertebrates.
4. Advanced scientific training in field biology to UBD students.

Description

Rationale

Baseline surveys of fishes and aquatic invertebrates are important both to record what species are present now for scientific and management purposes, and to establish a basis for monitoring trends. To put it simply, if we do not know what is there, and whether or not the populations are increasing or declining, how can the biota be managed properly? Furthermore, in many parts of the world, indigenous fish are seriously at risk from pollution, sedimentation and the introduction of exotic species; and these influences may be at work on Brunei's indigenous fish.

Scope

- A scoping exercise based on existing data should be carried out to prioritise the most critical sites to be surveyed.
- Emphasis should be given to least studied areas, and areas where biodiversity and/or number of endemics is expected to be high, such as headwaters of rivers, and peat swamps.
- The surveys should also incorporate collection of additional information useful for river management, such as observation of unsustainable practices, identification of endangered indigenous species and harmful introduced species, scoping of areas having tourism potential, etc.

Cost : B$ 200,000 (field equipment, logistics and research assistants)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B9	**Rapid assessment of the Protected Area system**
Strategic thrust	3.2.4
Time frame	Short to medium term
Lead agency	Forestry Department
Project Partners	• Universiti Brunei Darussalam • Museums Department • Town and Country Planning Department • Land Department • Survey Department

Benefits

1. Comprehensive, site-based management survey information on the conservation functions of the national forest estate
2. Basis for boundary revisions, classification and management regimes of forest reserves and other protected areas.

Description

Rationale

Brunei is currently a well-forested country, but the latest integrated report of survey information to provide forestry inputs to overall national land-use planning, in terms of representative habitats, water-catchments, production forestry, biodiversity, tourism, community use, etc. is that of the Brunei Master Plan (1987). This needs to be updated by integrating the latest remote sensing data with other information.

Currently, the forest reserves and parks do not provide adequate protection for all types of habitats and their functioning as biodiversity conservation areas has not been evaluated. For example, although there is an annotated checklist of trees, it has not been cross-checked against site information and there is a lack of faunal and floral survey information for most if not all habitat types, including damaged or degraded areas which might nevertheless have conservation value.

Furthermore, most production forestry is carried on outside the forest reserves. There should be a national plan to identify all land that is to be used for sustainable forestry and that land should be in the permanent forest estate under the administration of the Forestry Department.

Scope

1. Analyse latest remote sensing information (starting with the information collated under the PIF) together with other survey, management and scientific information to estimate the status, functions and values of all of Brunei's forests.
2. Identify required changes to land-uses and legal classification .
3. Study feasibility of those areas proposed as Zone 1b (proposed protected areas) in Section 2 of the PIF.
4. Carry out detailed mapping of protected area boundaries.

Separately from this project, these results would need to be integrated with other land-use interests for national planning

Cost : B$ 500,000 (Consultancy)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B10	**Gazette Belait Peat Swamp Complex as a Forest Reserve, and extend Ulu Mendaram Conservation Area**
Strategic thrust	3.2.4
Time frame	Long-term
Lead agency	Forestry Department
Project partners	• Universiti Brunei Darussalam – technical and scientific advice • International agencies, such as IUCN or WWF, which may be interested due to its global importance

Description

Gazette Belait Peat swamp complex

Although the Belait peat swamp forest was proposed as a forest reserve by the Brunei Forest Resources Strategic Planning Study (1984), it was never constituted as such. This proposal is still valid, as and the Forest Department is the most suitable agency to manage the peat swamp complex, due to its long experience in the area. Therefore, it is proposed that the entire Belait Peat Swamp be constituted as a forest reserve under the Forest Act 1934.

Extend Ulu Mendaram Conservation Area

It is understood that the Ulu Mendaram Conservation Area (c. 6,170ha) was gazetted as a Forest Reserve in 1996. This was the most suitable area to be constituted as a conservation area, as it is located in most inaccessible part of the peat swamp, and contains the non-commercial, but interesting sub-type of padang keruntum (*Combretocarpus rotundatus*), which occurs only in the most highly developed peat swamps.

It would be logical to increase the size of the Ulu Mendaram Conservation area in order to include the entire peat swamp block south of the Mendaram river. The conservation area would then also include undisturbed patch of *S. albida* (Alan bunga sub-type) forest . This would entail the following:

- A forest survey to ascertain if the proposed additional area still contains pristine forests which would be worth including (which is the case from examination of satellite images).
- Legal gazettement through the Forest Act 1934.

See Figure 3-4.

Cost : B$ 200,000 (Additional forest surveys)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B11	**Formulate a management plan for the Belait peat swamp forest**
Strategic thrust	3.2.4
Time frame	Medium term
Lead agency	Forestry Department
Project partners	Universiti Brunei Darussalam
Description	

Rationale

The Belait Peatswamp forest is of high conservation value due to its various functions including as a reservoir, natural water filtration plant, in flood control; for the unique and rare habitats it contains, the wildlife it supports (including the Borneo Clouded Leopard), and its role as a carbon store. Due to rapid conversion of peat swamp forest to agriculture elsewhere in Borneo, the Belait peat swamp may soon become the largest remaining peat swamp forest complex in the whole of Borneo.

It is important that the entire complex is managed as contiguous system, and that the maintenance of the full range of its bio-physical aspects is considered in the development of land use and sectoral plans.

Scope

- Conduct a Multi-Disciplinary Assessment (MDA) of the Belait peat swamp forest complex in order to develop an understanding of (among others) its biodiversity, ecology, hydrological regime, and socio-economic values.
- Based on the MDA, develop a sustainable management plan for the area.
- Make recommendations as appropriate for the gazettement of Protected Area(s) in the core conservation zones identified, a plan for sustainable resource use (i.e. to rationalize with other planned use including agriculture and mining), as well as rehabilitation of damaged areas, and mitigation against forest fires.

Note: Through the ASEAN-Australia cooperation, Australia has agreed to extend assistance to Brunei in developing a management plan for the Belait Peat Swamp Forest

See Figure 3-4.

Cost : B$ 500,000 (short-term consultancy)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B12	**Capacity-building and preparation of a national action plan for the wise use of peatlands and reduction of fire risk**
Strategic thrust	3.2.4
Time frame	Short term
Lead agency	Forestry Department
Project partners	• Global Environment Centre (GEC) • Environment and Disaster Management Unit, ASEAN Secretariat • Environment, Parks and Recreation Department • Universiti Brunei Darussalam • Brunei Fire Department

Benefits

1. The capacity of government agencies in peat land management and fire prevention and control will be substantially increased.
2. The knowledge base on the extent and management issues in Brunei will be increased.
3. A National Action Plan for peatlands will provide a generally endorsed and supported document to guide the implementation of projects for the wise use of peatlands in Brunei.

Description

Rationale

Brunei still has a large area of pristine peat swamp forest. Undisturbed peatlands have many values. They serve to reduce flood peaks in adjacent rivers and maintain base flow during dry periods, preventing saline water intrusion up the rivers. The vegetation communities on peat domes in Brunei are globally important for biodiversity conservation. Moreover, they are large carbon stores and actively accumulate carbon, mitigating the effects of climate change. However, degraded areas are increasing. These areas are extremely susceptible to fire, causing serious environmental problems such as haze and emitting large amounts of carbon dioxide, contributing to climate change.

At present, there is a lack of capacity on the wise use of peatlands and the rehabilitation of degraded areas. This project aims to address these gaps by drawing on the experience of other ASEAN countries in the conservation of peatlands, rehabilitation of degraded areas and strategies to prevent and control fire in peatlands.

Scope

1. Training on peat land and fire assessment.
2. Field peat land and fire assessments.
3. Latest information gathered on issues affecting peatlands in Brunei.
4. Preparation of a National Action Plan for peat land management by end February 2008 through the organisation of a stakeholder workshop.
5. Participation of Brunei in the design of a peat land fire prediction and monitoring system for ASEAN.

Financing by ASEAN Australia Development Cooperation Program (AADCP).

Cost : B$ 600,000
(preparation of training modules, conducting training programmes, consultancy for preparing national action plan & workshops)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B13	**Conservation surveys and management of Kerangas forests**
Strategic thrust	3.2.4
Time frame	Short to medium term
Lead agency	Universiti Brunei Darussalam
Project partners	• Viikki Tropical Resources Institute (VITRI), University of Helsinki, Finland • Brunei Forestry • ISB Million Trees Programme

Benefits

1. Identification of the suitable Kerangas forests of conservation and/or rehabilitation
2. Acquisition of expertise and new techniques in rehabilitating degraded or deforested land
3. Enhancement of the management capability for degraded land
4. Restitution of forest biodiversity on degraded land
5. Enhancement of forest connectivity in HoB

Description

Rationale

In Brunei, there are 3,455 ha of undisturbed Kerangas (heath) forests in addition to 1,339 and 2,814 ha which are classed as exploited and remnant kerangas, respectively (Anderson & Marsden, 1984). These forests are found mainly in the coast al zone of Brunei where most of the development is taking place (Figure 3-1).There are many casual observations of threatened wildlife in these areas (e.g., sun bear, clouded leopard, hornbills, etc.). Nevertheless, there has been much degradation of the kerangas forests here through a relatively long period of disturbance, which has included forest fires occurring frequently enough to retard and overcome recovery of the vegetation through normal regrowth.

Scope

This project will start with surveys of the kerangas areas marked on the Anderson & Marsden maps, with additional guidance from recent remote sensing. Depending on the results of the survey, plans will me made to rehabilitate or restore (if possible) and enrich (where applicable) burnt over areas and remnants of these forests using native species to restitute the forest biodiversity – but only where future protection is a possibility. Sites or areas which are `secure' (against forest fires and further disturbance) will need to be identified. The setting up of fire breaks is probably still deemed necessary. The identification of native species, germination and raising of seedlings, and other resources that will be used and methodologies adopted will be discussed with the international collaborator.

The project should result in the establishment of total protection for selected high conservation value sites, plus the rehabilitation of sites/plots which will be closely monitored for different parameters in order to identify and determine factors that can be used in management practices for degraded sites elsewhere in Brunei. The plots can be used for education, teaching and research. Depending on where they are sited, they may also play a significant role in joining up forests in the HoB area which have become partially or fully isolated due to habitat destruction.

Cost : B$ 500,000 (field surveys and equipment, research assistants)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B14	**Develop EIA process for the HoB area**
Strategic thrust	3.2.5
Time frame	Medium term
Lead agency	Forestry Department
Project partners	• Museums Department • Environment, Parks and Recreation Department • Attorney General's Chambers • Universiti Brunei Darussalam

Description

Rationale

The Environmental Impact Assessment (EIA) is a multi-disciplinary tool that predicts and evaluates the possible range of impacts of proposed projects on the receiving environment, and subsequently prescribes mitigation measures and monitoring requirements. It is a planning tool that can add value to a project, particularly in terms of improving design, siting, as well as the overall efficiency and/or profitability of the project.

Scope

In order to ensure that due consideration is given to the impacts of major developments in the HoB on the environment and biodiversity, the appropriate framework to enable implementation of the EIA should be developed and incorporated, especially with regard to activities such as:

- Conversion of natural forests to other land use.
- Plantation forest development (with separate EIAs for each discrete block).
- Logging concessions over 500 ha size.
- Onshore oil, gas, coal and any other minerals exploration.

The following aspects should be considered:

- Appropriate legislation and regulations, procedures, approval process.
- Development of guidelines for formulating the EIA.
- Technical capacity of government agencies to evaluate the EIA.
- Follow-up requirements e.g. implementation of Environmental Management Plan and monitoring.

This should be done in consultation with all stakeholders, including government agencies, sawmill operators and NGOs, under the overall guidance of the Brunei HoB Council. There are numerous examples of EIA applications for tropical forest landscapes available in neighbouring countries - these should be modified and improved as necessary.

Cost : B$ 200,000 (short-term consultancy, publications)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B15	**Generate legislation for biotechnology, including bio-prospecting**
Strategic thrust	3.2.6
Time frame	Medium-term
Lead agency	MIPR
Partners	• Forestry Department • Agriculture Department • Museums Department • Ministry of Health • Attorney General's Chambers • Universiti Brunei Darussalam • Corporate sector

Benefits

To provide the legal basis for a framework to protect and manage the national patrimony of resources that are of potential or proven value for biotechnological application

Description

Rationale

Brunei's biological resources are of immense potential value to biotechnology. This is a sector that is undergoing rapid global development with the OECD countries in the lead, mainly through corporate enterprise. Brunei stands to lose a lot if organisms and compounds are discovered in this country, taken overseas and developed without Brunei having any share in the enterprise. Currently, Brunei has no laws that are specifically designed to guard against this threat.

Scope

1. Undertake a rapid review of the global biotechnology industry and options that are open to source countries to participate in the industry while protecting their national property and rights. Where possible, take account of the experiences of neighbouring countries that have attempted to develop such legislation.
2. Develop a suitable legal framework to govern the management and handling of biological resources and intellectual property rights, to ensure that local communities and the nation as a whole derive maximum benefits for their biological resources and intellectual contributions.

Cost : B$ 100,000 (drafting of legislation)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B16	**Establish national Bio-prospecting Programme**
Strategic thrust	3.2.6
Time frame	Medium-term
Lead agency	Universiti Brunei Darussalam
Partners	• Forestry Department • Agriculture Department • Brunei Museums • Ministry of Health • Corporate sector • International collaborators/institutions/private sectors

Benefits

1. Enhancing/upgrading existing skill, acquisition of new specialized expertise and building on human resource capacity
2. The establishment and development of specialized infrastructural research facilities for drug and gene discovery
3. Diversification of the nation's economy
4. Integration of scientific research, product development and socio-economic development
5. Establishing local and international networking on Bio-prospecting project through HOB
6. Provide a foundation for the biotechnology industry

Description

Rationale

Biotechnology is a rapidly growing field that is expected to yield massive health, agricultural and other benefits. It depends on biological discoveries which provide new materials for application. The discoveries themselves depend on bio-prospecting. Brunei has enormous untouched biological wealth in the two most diverse habitats on earth: the rainforests and coral reefs.

Like most biodiverse, developing countries, Brunei has little involvement in bioprospecting due to a lack of technical capacities. This project would start a co-ordinated move towards developing this sector nationally. If successful it would greatly enhance the economic value of pristine natural habitats.

Scope

Establish an integrated programme for the discovery of biologically active terrestrial and aquatic flora and fauna for pharmaceutical drug development and biodiversity conservation.

Cost : B$ 400,000 (consultancy, capacity building)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B17	**Study potential of carbon and biodiversity offsets**
Strategic thrust	3.2.7
Time frame	Short-term
Lead agency	MIPR
Project partners	MoFAT

Benefits

Provide accurate overviews of the carbon and biodiversity offsets markets and how Brunei might engage with them, as a basis for possible future action.

Description

Rationale

Brunei is a natural, well maintained carbon sink, as well as being the home of a rich diversity of globally important wild species of plants and animals. Both of these aspects of the natural heritage have the potential to be marketed *in situ* for their value to planetary conservation. The nation needs to develop its expertise in these markets as a first step in understanding their potential to make direct contributions to the national economy. Further decisions on the possibility of entering these markets may then be made on the basis of this study.

Scope

Expert study of the carbon and biodiversity offset markets with recommendations for possible national involvement thereafter, including the development of model interventions based on well managed resource sequestration.

Cost : B$100,000 (Short-term consultancy)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B18	**Ulu Temburong National Park transboundary connectivity**
Strategic thrust	3.2.8
Time frame	Short term
Lead agency	Forestry Department
Project partners	Ministry of Foreign Affairs & Trade Tourism Brunei

Benefits

1. Forest connectivity (maintain Ulu Temburong's connection with the rest of HoB)
2. Biodiversity protection
3. International prestige

Description

Rationale

Forest connectivity is the foundation of the HoB vision. It must be vigorously pursued throughout HoB. Ulu Temburong NP is the jewel in Brunei's forest crown. It must not be allowed to suffer the effects of isolation in a man-made landscape.

Brunei should therefore seek a commitment from Sarawak to maintain in perpetuity at least a buffer zone of permanent forest estate, much of which may be under sustainable production forestry, through which Ulu Temburong would remain linked to the rest of HoB through the Mulu area (which links directly back to Brunei through Sg Ingei) and/or through the Ulu Limbang to the Kelabit Highlands in the north central spine of HoB (Figure 3-3).

There would be some benefit to Sarawak in this, in as much as a large core of virgin rainforest adjacent to Sarawak's production forest would have ecological benefits, such as helping to maintain elements of the natural ecosystem in the logged area, including for example, dipterocarp seeding. Furthermore, there could be joint management research, patrols, etc.

Scope

The work would focus on negotiating Sarawak's commitment to the maintenance of the necessary forested landscape and transboundary co-operation on enforcement, etc.

1. *Years 1 & 2:* Exploration of possibilities and negotiation with Sarawak, culminating in joint declaration of intention or memorandum of understanding
2. *Thereafter*: Such follow-up as may be appropriate to maintain the forest connectivity.

Cost : B$ 100,000
(Feasibility study. Further costs to be determined following agreement with Sarawak Government)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B19	**Sungei Ingei/Gunung Mulu transboundary park**
Strategic thrust	3.2.8
Time frame	Medium to long term
Lead agency	MIPR
Project partners	• Forestry Department: lead operational agency for Brunei • Ministry of Foreign Affairs and Trade : international relations • Museum: wildlife management and research • Ministry of Defence: management of military exercises in the area • Universiti Brunei Darussalam: science & management research

Benefit(s)

1. Forest connectivity (Brunei's most viable link with the rest of HoB)
2. Water catchment protection (Belait river basin)
3. International prestige
4. Biodiversity protection
5. Scientific Research
6. Ecotourism

Description

Rationale

Forest connectivity is the foundation of the HoB vision. It must be vigorously pursued throughout HoB. The proposed transboundary park would link a World Heritage site in Malaysia (Mulu) to an important conservation forest in Brunei and through to other forests in the Belait river basin (Figure 3-3).

Nevertheless, work in the area must take account of the Sungei Ingei Protection Forest Reserve's role as the only place in Brunei which has extant mixed dipterocarp forest, freshwater swamp forest, peat swamp forest and heath forest all within a relatively small area and all in good condition. It is of critical importance for this alone. It is also a sensitive environment and any developments, especially anything that involves building, needs to be done with the utmost care, with proper planning to avoid harmful environmental impacts.

Scope

The project would require co-ordination to plan and execute in harness with Sarawak along the lines indicated in the time frame above. It would be two-pronged at the beginning, focusing on:

- Organising an international scientific expedition to gather scientific and management information, raise global awareness on HoB generally and Brunei's forests specifically, and facilitate day-to-day operational co-operation between the conservation authorities of Brunei and Sarawak.
- Negotiating Sarawak's commitment to the creation of an international transbounday park.

The results of these exercises would be applied in the early management planning phase.

1. Y1-2 : Negotiation with Sarawak, scientific expedition and preliminary management plan.
2. Y3-5 : Formal international agreement and legal instruments, initial management and tourism investments for Sungei Ingei area, and development of transboundary management practices.
3. Long-term – establishment of park infrastructure, management and facilities in Sungei Ingei area, plus transboundary tourism marketing and development.

Cost : B$ 800,000
(Preliminary management plan, Scientific expedition, Management plan)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B20	**Belait peat swamp forest transboundary connectivity**
Strategic thrust	3.2.8
Time frame	Medium term
Lead agency	Ministry of Foreign Affairs and Trade
Project partners	• Forestry Department • Survey Department

Description

Rationale

The Belait peat swamp complex, in its natural state stretches to the eastern banks of the Baram river in Sarawak. Although much of the forests on the Sarawak side have been logged over or converted to agriculture, there remain some patches of forests in relatively good condition. Most importantly, these patches are located adjacent to the Ulu Mendaram Conservation Area, and the proposed forest rehabilitation zone west of the Belait river near Kuala Belait.

In order ensure that the integrity of its boundaries are secured, it is important that cooperation be established with the Sarawak Government to manage the adjacent forests on the Sarawak side of the border (east of the Baram river); most pertinently to maintain the forested area adjacent to the Ulu Mendaram Conservation Area (Figure 3-3 and 3-4).

Scope

Establish working cooperation with the Sarawak Government. The objective would be to retain the remaining forests on the Sarawak side of the border as a buffer zone, and to manage the impacts of non-forest land use to ensure minimal impacts on the integrity of the Belait peat swamp forest.

Cost : Covered in Intervention B11

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B21	**Integrated management of Brunei Bay**
Strategic thrust	3.2.8
Time frame	Short-term
Lead agency	MIPR
Project partners	• MoFAT • Fisheries Department • Museums Department • Environment, Parks & Recreation Department • Universiti Brunei Darussalam
Benefits	
Integrated management of Brunei Bay's natural resources and the transboundary activities of people in the area	
Description	
Rationale Brunei Bay is a natural system that is interconnected through the complex natural coastal processes, and is affected by human activities both in Brunei (Brunei Muara and Temburong) and in Sarawak (Limbang) (See Figure 3-3). While parts of it can be managed individually, impacts occur from place to place within the overall system (including from the human population which can freely cross borders). It would therefore be more effectively managed as an integrated coastal resource zone. **Scope** • Assess the effectiveness of Brunei's existing legal and management framework. • Initiate discussions with Sarawak/Malaysia to explore joint management options. • Generate detailed recommendations for both governments to consider.	
Cost : B300,000 (Short-term consultancy)	

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B22	**Combat wildlife crime**
Strategic thrust	3.2.8
Time frame	Short-term
Lead agency	Agriculture Department
Project partners	• Customs Department • Police • Judiciary • Attorney-General's Chambers • Ministry of Communications

Benefits

1. Systematic survey information on national law-enforcement capability
2. Training in wildlife crime prevention for enforcement officers.
3. Training in wildlife crime law for judges and prosecutors.
4. Training in customs and border checkpoint operations.

Description

Rationale

Brunei has been a member of CITES since 1990, and has signed three additional agreements with its partners at regional level which are pertinent to managing its trade in wild animals and plants:

- ASEAN Statement on CITES (2004);
- ASEAN Regional Action Plan (RAP) on Trade in Wild Fauna and Flora (2005);
- ASEAN Wildlife Enforcement Network (ASEAN-WEN), implementing RAP Objective 2.

Brunei has requested the ASEAN-WEN Support Program (implemented by TRAFFIC and Wildlife Alliance) to provide national level support in implementing its obligations to develop inter-agency taskforces to combat wildlife crime.

Scope

- National-level survey of Law Enforcement Capacity.
- Wildlife Crime Investigation Course (including joint activities with Indonesia and Malaysia).
- Judicial Training Course.
- Customs and Border Checkpoint Training Courses.

Cost : B$250,000

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention B23	**Needs assessment for science-based management for CITES**
Strategic thrust	3.2.8
Time frame	Medium term
Lead agency	MIPR
Project partners	• Universiti Brunei Darussalam • Fisheries Department

Benefits

1. Scientific basis for implementing CITES management obligations
2. Information networking with other countries' CITES authorities, including Indonesia and Malaysia

Description

Rationale

For Brunei to manage any legal harvest and trade of CITES-listed species, sustainability assessments and assurances of legal chains of custody should be carried out. These should be based upon systematic assessments of the resource base to ascertain levels of off-take from the wild that would not negatively impact the survival of populations in the wild, known in CITES terminology as a 'non-detriment finding'.

Scope

To develop management strategies, and to ascertain a scientific basis for any permitted trade that complies with BN national laws and CITES procedures, levels of trade for selected species would be examined using the experience of previous and ongoing TRAFFIC research methodology. Exemples include Box Turtle *Cuora amboinensis*, Agarwood/Gaharu *Aquilaria spp.*, Common Rat Snake *Ptyas mucosa*, Humphead Wrasse *Cheilinus undulatus*. This would also assist Brunei in strengthening the workings of its CITES Scientific Authority, as well as providing the exchange of vital information on populations' status, harvesting and trade.

Cost : B$ 80,000
B$20,000 (needs assessment)
B$60,000 (per selected species or category studied)

This page has been left blank intentionally

Strategy 2 : Tourism in the HoB shall be enhanced through development of niche nature tourism products and joint tourism promotion with Bornean countries. The scale of development shall take into account the environmental and cultural sensitivity of the areas being developed.

3.3.1 Introduction

Blessed with some of the most well-preserved dipterocarp, montane, peat swamp, heath and mangrove forests in Borneo, which contain an astounding variety of plants and animals, there is great potential for growth in the nature tourism industry in Brunei Darussalam. Brunei's "green" image, coupled with the rich cultural heritage the Sultanate has already been adopted as the strategic market positioning for the country. This is underlined by the current tagline utilised by Brunei Tourism: "The Green Heart of Borneo – A Kingdom of Unexpected Treasures".

As the presence of more established markets in the region, coupled with restrictions on alcohol and entertainment mean that standard resort, golf, conference and exhibition markets cannot be competitive, the importance of the nature tourism component in the overall development of Brunei Darussalam's tourism industry should not be underestimated.

However, nature tourism here is very much in its infancy – both in product and market development. Apart from Temburong National Park and the proboscis monkeys, the products on offer have limited appeal to the average tourist, useful facilities are minimal at most sites, there is limited information available to the tourist, and niche markets (e.g., birding) have been neglected. In terms of brand awareness. The low percentage of tourists who visit the nature tourism sites indicates that Brunei is not yet recognised as a nature tourism destination. In other words, the full potential of nature tourism in Brunei Darussalam is yet to be realised. When this potential is fully developed, it is very possible that revenue from nature tourism sources would provide substantial income to the national economy and local communities, as well as to help fund conservation programmes.

However, without a coherent Masterplan to develop the nature tourism industry as a whole, there will remain a lack of vision, the development of infrastructure and human resource will continue to be *ad hoc*, and the marketing message will not be in tune with the reality on the ground. Another limiting factor is the lack of cohesion between, on the one hand, the various government agencies that manage the attractions and related land uses, and, on the other hand, Brunei Tourism which is tasked with general tourism development and marketing, and the tour companies that run the packages.

Enhancing transboundary cooperation with Sabah, Sarawak, and Kalimantan, and developing a marketing strategy for Borneo as a whole would be beneficial for all three countries. Brunei Darussalam needs to develop its niche in this as a natural 'Gateway to Borneo'. Since both Kota Kinabalu and Kuching are already developed as competitors, with higher traffic volumes, Brunei would best work in co-operation

with them through packages that offer complementary experiences in both Brunei and Malaysia (and Indonesia, in time).

Therefore, the following strategic thrusts and interventions are based on two underlying premises; i.e.:

- Although the development of the local nature tourism industry cannot be rushed due to the presence of a number of inter-related factors, nevertheless there must be a clear vision and overall plan to steer the direction of this industry.
- Cooperation between Bornean states is the key to tourism growth in Brunei; and this is the core area in which the HoB initiative may be of value.

3.3.2 Enhance regional tourism cooperation through HoB

Tourism is very unevenly developed between the different states of Borneo. While it is best developed in Sabah (reflected in its ability to earn about twice as much per tourist as Peninsular Malaysia), and both Sabah and Sarawak have good physical tourism infrastructure and receive substantial state and federal investments in promotion, Kalimantan lacks the physical infrastructure for major tourism growth and Indonesia's airlines have been declared unsafe by the EU. Brunei on the other hand has excellent physical infrastructure and boasts a very safe environment with a number of attractions, but lacks the scale and variety for developing the long-term market. Its strategy is therefore to develop a strong short-stay market.

"Borneo" is already a global brand in itself, having a long history of romantic imagery based on longhouses, head-hunters, the Sultanate, deep jungles and orang-utans, etc. If all three countries use the term *Heart of Borneo* in their tourism promotions for the island, this could strengthen the overall tourism branding of the area, but this will only benefit returns from HoB if the accompanying messages and the in-country tourism operations themselves build on their own strengths in nature and community based tourism.

This does not mean that all three countries must simply compete for exactly the same market segments (although some such competition is inevitable). Already, Indonesia has special attractions for the back-packer and adventure segments, because the other side of the coin of lack of infrastructure is "off the beaten track". Sabah has successfully developed the high-end segments, offering marine and wildlife adventure, along with Gunung Kinabalu and some of the best luxury hotels and golf resorts in the region. Sarawak has developed some wildlife and longhouse tourism, but cannot package this with competitive beach resorts and has not really built on the "headhunters/White Rajahs" imagery that is an obvious possibility. Brunei offers the cultural allure of the unique Sultanate and the most luxurious hotel in the region, together with excellent short-term forest experiences, but has not really developed the longer term forest experience or wildlife viewing sectors.

The existing BIMP EAGA Working Group on Joint Tourism Development is the most appropriate platform to foster a closer working relationship between the three countries. While there is a likelihood of initial feelings all round that tourism must be competitive between the three countries, there is potential for enhancement of cooperation in areas such areas as:

- Open borders - to facilitate international packages, especially where access to one country's attractions is most convenient via another country. For example, Pulau Selirong could be conveniently reached via Limbang or Kota Kinabalu. Likewise, Betung Kerihun and Danau Sentarum and their local communities would benefit from easy tourist access from Sarawak. In both of these examples, the originating countries' tourist companies would benefit from additional attractions to market.
- Emphasizing package tours which provide a combination of destinations within Brunei, Kalimantan, Sabah and Sarawak.
- Airline agreements – especially for packages that involve arrival on Borneo in one country and departure via another.
- Facilitating cross-border investments by the private sector.
- Attracting niche ecotourism markets (e.g., bird watching and orchid discovery tours) where there may be high-end inter-continental demand for seeing in one tour a number of key species that are spread out over the island.
- Handicraft production – for example, since production costs are high in Brunei, it may be feasible to outsource from neighbouring countries.
- Developing overall branding.
- Developing a Borneo travel planner.
- Joint marketing and promotions, as well as sharing booths at tradeshows.

At the same time, effort must be made to ensure that the unique identity of Brunei Darussalam is not lost within the greater HoB context.

3.3.3 Enhance nature tourism products

Although there are many nature based sites in Brunei, the two major attractions which are geared towards international tourism are Temburong National Park, currently managed by the Forestry Department, and Tasik Merimbun Heritage Park, managed by the Museums Department. The other attractions, such as Selirong mangroves, are not as well-known yet, and there are a number of opportunities to capitalise on specific biodiversity highlights of Brunei Darussalam's rich terrestrial biodiversity (See following strategic thrust).

There is a need for a masterplan to guide the sustainable development of nature-based tourism in Brunei. Apart from ensuring that this industry is developed according to a shared vision, such a plan will also serve to facilitate local and foreign investment into these areas.

The strategy here is to develop general nature tourism in Brunei based upon the existing major attractions, i.e. Ulu Temburong National Park and Tasik Merimbun Heritage Park. This entails managing and developing tourism in these areas in a sustainable manner, in view of increasing visitation numbers and length of stay to achieve optimum revenue while, being mindful that increased use does not negatively impact the natural environment.

A major setback to the development of the nature tourism industry in Brunei is the lack of specialized nature guides. This is a shame, in view of the great opportunity for wildlife spotting in the easily accessible forests in Brunei. It is also difficult to

market niche nature tourism (e.g. birds, butterflies) if there is no local capacity in these areas.

The lack of interest stems from a general belief that the market for nature tours is limited, coupled with the general preference for more stable employment in the public sector. Existing generalist tour guides are not interested to venture into nature tourism, perhaps due to a lack of interest in nature or simply because there is no opportunity for them to pick up the essential skills and knowledge required.

It is thus important to educate the public that a career in nature guiding can be exciting as well as rewarding. Thus the objectives of this strategy are two old – to improve the quality of and number of nature guides in Brunei

Interventions
T1 Formulate the National Ecotourism Masterplan
T2 Establish the Brunei Green Guide Programme
T3 Enhance local community participation in nature tourism

3.3.4 Develop niche tourism products

Product and market development share a 'chicken and egg' type relationship. Essentially, a tourism product cannot be fully marketed if it is not properly developed (i.e. has sufficient facilities, interpretation material, skilled guides etc.), and conversely it is usually not feasible to develop the tourism product if there is a lack of a ready market .

At present, niche tourism markets are not well developed, only a very small number of tourists take up bird tours, which are offered by an even smaller number of specialised ecotourism outfits.

The potential of niche tourism products and lesser known nature sites should be recognised, and gradually developed in a sustainable manner.

Interventions
T4 Facilitate birdwatcher tourism
T5 Facilitate culinary tourism - The Hearty Food of Borneo
T6 Facilitate macro-photography tourism - Brunei in Close-up

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention T1	**Formulate the National Ecotourism Masterplan**
Strategic thrust	3.3.3
Time frame	Short term
Lead agency	Brunei Tourism
Project partners	• Forestry Department • Museums Department

Benefits

1. A shared vision and plan for eco-tourism, rather than *ad hoc* development
2. Sustainable development of tourism facilities in nature based sites
3. Encourage local and international investment

Description

Rationale

The HoB initiative opens up vast opportunities for nature in Brunei. It is therefore vital that the growth of ecotourism development is carefully charted to ensure robust growth and the natural environment is safeguarded.

Scope

The National Ecotourism Masterplan should :

- Develop a vision and strategy for ecotourism development in Brunei.
- Identify existing and potential ecotourism sites in Brunei.
- Specify the types of activities/development allowed at each site.
- Highlight unique ecotourism niches and areas to be developed.
- Develop guidelines for ecotourism including facilities for accommodation, infrastructure, nature trails and activities.
- Identify business and management plans required for each major site: Based on scientific data and analysis of the biophysical environment, these plans should set out the management objectives, Limits of Acceptable Change (LAC), zoning, infrastructure development, marketing and communications and management requirements etc for each site.

Cost : B$ 400,000
(Consultancy to develop masterplan and guidelines, capacity building)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention T2	**Establish the Brunei Green Guide Programme**
Strategic thrust	3.3.3
Time frame	Medium term
Lead agency	Brunei Tourism
Project partners	• Universiti Brunei Darussalam • Museums Department • Forestry Department

Benefits

1. Enhancing quality of nature guiding
2. Creating specialist naturalist guides
3. Establishment of nature guiding as a rewarding career

Description

The Green Guide programme can be integrated into the existing tourist guide certification scheme. The Green Guide certification scheme may include the following:

- Basic Green Guide certification
- Specialist Green Guide Certification
- Local Community Green Guide certification
- Green Guide Trainer certification
- Youth Green Guide certification

Local and regional experts from various fields would be required to develop the modules, and conduct the initial courses. The basic modules may include:

- Knowledge of wildlife
- Knowledge of plants and trees, including ethnobotany
- Conservation issues, and caring for the forest
- Jungle survival and first aid skills
- Public presentation and language skills

The course should be field based, with emphasis on experiential learning. Follow up activities to enable continuous improvement for Green guides include study tours to other parts of Borneo, video screening, and joint events with nature societies including Brunei Nature Society and Panaga Natural History Society.

Cost : B$ 400,000 (develop programme modules, training)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention T3	**Enhance local community participation in nature tourism**
Strategic thrust	3.3.3
Time frame	Medium term
Lead agency	Brunei Tourism
Project partners	• Universiti Brunei Darussalam • Museums Department • Forestry Department

Benefits

1. Creating additional income for to the local communities
2. Increasing sense of ownership, pride and environmental awareness among the local community
3. Enhancing experience for the tourists

Description

Rationale

At present, there is limited avenue for local community participation in tourism in Brunei. It is important that this situation is addressed, in view of the many potential benefits that this may bring.

Scope

Local community participation should be incorporated gradually, at sites where it is feasible to do so. As a start, model projects may be developed for local communities living in proximity to Tasik Merimbun and Temburong National Parks, as these areas are among top ecotourism attractions in Brunei, with potential scope for local community involvement in tourism. The general steps to be taken are:

1. Feasibility study: To assess local interest, and specific areas for involvement
2. Design business programme and business plan: Identify specific goals, partners, modalities

Food preparation may be the easiest area to start, whereby local communities prepare meals for visiting tour groups on demand. This is also an intimate cultural experience for the tourists, as they get to sample home-cooked, traditional food. Other possible areas include cultural shows, community tours (e.g. forest herb tours, village tours), homestay, and handicraft production.

Possible contact points may be via the various Ketua Kampungs (village heads), or the existing co-operatives established under the One Mukim One Product programme.

This intervention is linked to the Local Community Green Guide certification (Intervention T2). It should be remembered that in projects involving local communities, it may take a long time to see results, and as such a long term view should be taken in planning and implementing these projects.

Cost : B$ 200,000 (feasibility study and plan, capacity building)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention T4	**Facilitate birdwatcher tourism**
Strategic thrust	3.3.4
Time frame	Short to medium term
Lead agency	Brunei Tourism
Project partners	• Museums Department: habitats management, species protection • Forestry Department: habitat management

Benefit(s)

1. Growth in ecotourism through development of a large, resilient niche market
2. Good business for Brunei tourism companies
3. Job opportunities for nature lovers with little formal education required

Description

Rationale

Birdwatcher tourism is in its infancy in Brunei. The potential market is large and lucrative, with literally millions of people being members of birders' associations. e.g., the British Ornithologists Union is said to have close to a million members. The Oriental Bird Club is a thriving organisation of people who have a specific interest in the birds of this part of the world. Similar groups can be found in many other countries. It only takes a tiny percentage of the world's birdwatchers to sustain an ecotourism industry – so long as the attractions are there, backed up by infrastructure and services, including expert guidance. The market is presumably segmented, from backpackers to high-end, luxury tourists who will pay top-dollar (up to US$100 per day guide fees were reported in the 1990s) to see specific birds (e.g., Borneo endemics).

Basic requirements

- sites where they can easily see a variety of local birds, covering the national range of habitats from coastal to montane.
- chances to see Bornean endemics (29 species, e.g., Borneo Bristlehead, Bulwer's Pheasant; Dusky Munia), and other species that are generally rare or hard to observe.
- chances to see nesting and other aspects of bird behaviour that may interest them (the rarer and more unusual a sighting, the higher its value; e.g., aerial jousting helmeted hornbills, which has been seen at least twice in Brunei but is not yet scientifically described, would be at the top of any global list).
- well-trained and knowledgeable guides.
- travel logistics made easy.
- convenient attractions for spouses and families who are not birdwatchers (e.g., golf, beaches, shops, etc.).
- a variety of packages or do-it-yourself opportunities to choose from.

Scope

- assessment of current national status of birdwatching tourism (statistics, promotion, companies, investments, role of government, successes, handicaps, etc.).
- basic market research in one or two probable source countries (e.g., Japan, UK. Netherlands) focusing on demand factors and means of communication through specialist media, iconic personalities (e.g., Bill Oddie) who could be invited to Brunei to report back on what is on offer (but only when the sites and services are operating to high standards).
- rapid assessment of current birdwatching tourism in Malaysia for lessons learned and to assess possibilities of direct competition, joint venture operations and expert assistance.
- guides (current status, training, incentives, etc.).
- focus-points for development (e.g., priority sites, priority species).

Cost : B$ 200,000 (market research, develop marketing plan, capacity building)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention T5	**Facilitate culinary tourism - The Hearty Food of Borneo**
Strategic thrust	3.3.4
Time frame	Short to medium term
Lead agency	Brunei Tourism
Project partners	• Museums Department: cultural expertise & expert advice • Agriculture Department: expert advice on traditional cultivation • Forestry Department: habitats management

Benefit(s)

- Growth in tourism through development of a new niche market
- High profiling of Brunei culture and nature
- Good business for Brunei tourism companies
- Job opportunities for specialists with little formal education required
- Tourism business links with other HoB countries

Description

Rationale

There is a large and growing interest in culinary tourism. Nowadays, a significant number of tourists are fascinated by traditional foods, as found in homes and roadside stalls, etc., in as exotic and little-known destinations as possible. Interest, as shown in TV programmes, is also turning to how food is produced.

As Borneo boasts a myriad of cultures and forests that are year-round producers of edible fruit, herbs and vegetables, there must be a market opportunity in developing this sector. It may be possible to link health and wellness (e.g., organics, natural tonics such as *Tongkat Ali*) to health virtues from an alcohol-free holiday.

Given the linkage of food and culture, this would naturally link up to Brunei's cultural attractions, ranging from Kampong Ayer to stunning mosques. Brunei's unique selling proposition would be the link to the forest and the ability to take visitors there to see foods and medicines in their natural homes, as well as having demonstrations of traditional harvesting and preparation.

Basic requirements

- sites where they can easily find the fruit, herbs & vegetables growing naturally or in traditional cultivation.
- demonstrations by suitably skilled local people.
- well-trained and knowledgeable guides.
- travel logistics made easy.
- a variety of packages or do-it-yourself opportunities to choose from.

Scope

- basic market research in one or two possible source countries focusing on demand factors and means of communication through specialist media (especially TV), iconic personalities who could be invited to Brunei to report back on what is on offer (but only when the sites are ready to receive tourists).
- site development, based on a few rural communities/forests that can be developed for this purpose (Linked to intervention T4).
- TV programme planning for global outreach.
- guides (current status, training, incentives, etc.).

Cost : B$ 150,000 (market research, develop marketing plan, capacity building)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention T6	**Facilitating macro-photography tourism - Brunei in Close-up**
Strategic thrust	3.3.4
Time frame	Short term
Lead agency	Brunei Tourism
Project partners	• Brunei Museums: species expertise • Forestry Department: habitats management
Benefit	
Growth in tourism through development of a new niche market	
Description	

Rationale

Borneo is a world centre of invertebrate diversity, with dozens of new species being discovered annually. Moths, butterflies and beetles are already the subject of special interest groups in many parts of the world and there is at least a small niche market for this. The possibilities, however, go further. For example, a day trip to Ulu Temburong can yield, for the avid arachnologist, evidence of several new species of spiders, which can be photographed, if not collected. While it seems unlikely that strong niche markets can be developed based on specific types of invertebrates – there just may not be enough spider enthusiasts, for example, to make this viable – there may be a considerable market for macro-photography that would take advantage of Brunei's amazing diversity of insects, spiders, flowers, etc. Certainly, worldwide interest in macro-photography is evidenced by the books and magazines dedicated to this; and rapidly developing technology is bringing this hobby within the reach of more and more people.

Scope

This project would yield a preliminary assessment of the possibilities.

Cost : B$ 50,000 (preliminary assessment)

3.4 Strategy 3 : The development of non-renewable resources shall be carried out in a manner that imposes minimal impacts on the environment and protects the integrity of forest connectivity.

3.4.1 Introduction

The proposed HoB area contains much of the natural resource wealth of Brunei Darussalam, the continued sustainable use of which is of great importance to the economy and security of the country.

The forests are a source of timber, which is extracted purely to meet local demand; they are also a source of food and building material for the native communities living in the interiors (although out-migration to towns and increases in material wealth have greatly reduced this use in Brunei). The forests are a storehouse of plants which may have value in the health and pharmaceutical industry; and perhaps most important, but least recognised of all, forests play a integral function in the maintenance of the country's physical environment – ensuring that water supply needs are met, that the occurrence of flooding is minimised, and air is purified. The forests are also a carbon sink (particularly the peat swamp forests) which play a role in the mitigation of global climate change.

In previous times, forests around the villages were converted for swidden farming, particularly hill paddy. Now many of these farms have been abandoned, as the villagers migrate to the towns. The current agriculture strategy of Brunei, which emphasises establishing the Brunei Halal brand, and on developing high-value processing further up the chain, as well as poultry, livestock and hydroponic farming, means that there is very limited demand for land from the agriculture sector. Furthermore, development of plantations (especially oil palm) is not encouraged, but seen to be in conflict with the general socio-economic aspirations of His Majesty's government.

Apart from the forests, the interior of Brunei contains mineral deposits, including petroleum, natural gas and coal; the bulk of which still remain untapped. While most of the of the natural resources required for the housing and construction industry are imported from neighbouring Sabah and Sarawak, Temburong is an important source of gravel, and the peat swamp forests around the Belait-Tutong areas are an important source of sand.

3.4.2 Manage environmental impacts of sand extraction

Sand is an important aggregate for the construction industry. In Brunei, this resource is available in close proximity to the main housing scheme developments which are along the coast in the Belait district. A common low-cost method of obtaining sand is by use of burrow pits, which are essentially shallow pits approximately 4-5 metres deep. These are generally located on the margins of the peat swamp forests along the southern side of the Tutong-Seria highway and the Seria by-pass, particularly at Sg. Liang at Lumut, Lorong Tengah and Pandan

(Figure 3-5). While this activity may have a number of potential impacts on the environment, there are as yet no specific environmental regulatory requirements.

Intervention
R1 Develop measures to minimise the environmental impacts of sand extraction

3.4.3 Manage environmental impacts of onshore oil, gas and coal exploration

A large portion of the proposed HoB area in Brunei falls within three onshore petroleum blocks. The largest of these is Block M (3010.59 km^2), which covers the bulk of the Belait district including the Belait peat swamp forest, Labi Forest reserve, and the Inter-Riverine Zone (IRZ). The second largest, Block L (2,252.74 km^2) overlaps with the HoB area around Tasik Merimbun, and at the Selirong forest reserve (Figure 3-6). The BSP onshore agreement block overlaps at the edge of the proposed HoB boundary along the Seria-Kuala Belait highway and the Rasau/Sg Teraban area.

Coal was first reported from Brunei Darussalam in 1837. Since then, there have been sporadic investigations by private companies and the government. Coal deposits occur at Brooketon, Kianggeh & Mentiri Valleys, Berambang island, Upper Tutong - Keduan Valleys, Ingei - Topi Valleys, Lumut and the Labu Syncline (Figure 3-7). Although there are no mines currently operating, there has been some recent interest to begin exploration for commercial extraction.

Mining concessionaires are important stakeholders in HoB, in that they are responsible as principle users, occupiers and managers of the land in their respective concession areas. The concession agreements are the key documents which specify roles and rights of the concessionaires, and procedures for use by contractors or third parties etc.

BSP has developed a comprehensive land management system, which also prescribes environmental procedures. For instance, before occupying any surface area or areas of Scheduled Land for its operations, BSP must conduct a comprehensive baseline environmental survey of the area so as to ensure that potential environmental liabilities can be properly addressed.

For future mining within the proposed HoB area, the following should be considered:

- To entirely avoid high impact operations (e.g. open cast mines) in high conservation value forests (Zone 1a and 1b)
- To ensure that future concession agreements take into cognizance procedures suitable to ensure environmental and conservation requirements
- To make Environmental Impact Assessments (EIA) a mandatory requirement (See Intervention B14 – Develop EIA process for the HoB)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention R1	**Develop measures to minimise the environmental impacts of sand extraction**
Strategic thrust	3.4.2
Time frame	**Medium-term**
Lead agency	Environment, Parks and Recreation Department
Project partners	• Town and Country Planning Department • Housing Department • Land Department • Agriculture Department • District Offices

Description

Rationale

There are a number of potential impacts of sand extraction on the surrounding environment; the two main ones being the impact on the hydrological regime of the peat swamp forests, and the unmitigated extension of burrow pits causing loss of the forest margins.

However, as there are at present no regulatory requirements to look into the environmental impacts, these impacts are not clearly understood, thus effective mitigation measures to limit these impacts cannot be taken. This situation needs to be rectified.

Scope

The Environment, Parks and Recreation Department shall conduct a study of the impacts of sand extraction on the environment through the various extraction methods. The study components may include the following:

- Impacts to hydrology and water quality
- Impacts to the health of adjacent peat swamp forests
- Air and noise impacts

The study should then be able to produce recommendations for the mitigation of the environmental impacts, including:

- Improved methodologies (e.g. to dig deeper pits in order to avoid having to use larger areas),
- Regulations and procedures
- Suitable closing and rehabilitation

Cost : B$ 100,000 (short-term consultancy)

This page has been left blank intentionally

3.5 Strategy 4 : Continuous environmental education and awareness, with focus on community outreach programmes, shall be promoted to ensure the sustainability of the HoB initiatives

3.5.1 Introduction

As the success of the HoB initiative requires sustained support from all sectors of society, communications, education and awareness are thus key aspects to be considered.

It should be noted that environmental consciousness is already relatively strong amongst the Brunei population, especially among the youth, due to sustained efforts of the government, particularly the Department of Environment, Parks and Recreation and the Forestry Department. In addition, there is strong support from private organizations such as Brunei Shell Petroleum (BSP) and HSBC through their respective Corporate Social Responsibility (CSR) initiatives. The programmes and activities have taken the form of exhibitions, talks, camps, and competitions such as essay writing, quizzes and photography. Printed material, including books, magazines, brochures and posters are also produced.

Awareness programs organized by the Forest Department place emphasis on forest conservation, for instance the annual tree planting and nature camp held each year in conjunction with World Forestry Day, and the Brunei Shell Petroleum Company supported annual Princess Rashidah Young Nature Scientist Award (PRYNSA), which provides the opportunity for students to conduct scientific studies on forest-related environmental issues.

As the Government of Brunei has been proactive in promoting conservation through the many awareness programmes, the next natural step is to develop a long-term environmental education programme that is integrated into the formal education system.

This strategy also takes into cognizance the eight ethnic groups that traditionally occupied the interiors of Brunei. Although the level of dependency on the forest for livelihood has reduced immensely over the last two decades, in tandem with an improved economic status, it is widely believed that the rich traditions and culture of these ethnic groups are slowly disappearing with the advance of modernisation. Therefore, the foremost task that should be undertaken is the documentation of indigenous knowledge of the environment.

3.5.2 Develop HoB community outreach

The success of the HoB initiative requires the sustained support of all sectors of society including the government, public and private sector. In order to do this, the initiative must be visible, with a clear message so that its vision, objectives and strategies are understood; or better yet, taken aboard with a sense of ownership.

The most direct and effective way to achieve this is through allowing avenues for public participation.

Tree planting programmes are the most obvious ways in which public participation may be incorporated. Leading the way in this respect is the Million Trees Project, initiated by the International School Brunei (ISB) in support of the HoB initiative, which aims to plant one million trees throughout Borneo. Already, it has put Brunei Darussalam in the spotlight in being able to attract the world renowned conservationist, Professor David Bellamy, and Nobel laureate, Professor Wangari Maathai to its launch at the Borneo Global Issues Conference in March 2006.

However, other sectors of the public, and other schools particularly should also be provided an avenue to do the same. After all, the more trees planted the better!

Interventions
E1 Develop the Brunei HoB national communications strategy
E2 Develop the Brunei HoB community reforestation programme

3.5.3 Develop Environmental Education

At present, there is no official policy to integrate Environmental Education (EE) in the national education curriculum. However, the Ministry of Education has set up the Science, Technology and Environment Partnership (STEP) Centre of Brunei Darussalam to implement environmental education programmes. STEP's current focus is on enhancing collaboration and communication between educational institutions and other government organisations (at national, regional and international levels) with regard to the development of science, technology and environmental studies in Brunei.

It is widely recognized that a long-term EE program that is integrated into the national education curriculum is crucial to the promotion of conservation and environmental protection. Environmental education as a syllabus in the formal education system will ensure the continuous process of acquiring knowledge, skills and values on conservation and environmental protection among the students. Via the formal education system, the context of EE can be more holistic, and cover a wider range of issues than ad-hoc programmes can.

In addition, EE programs may also be established for adults. This may be done through developing in-house EE training programmes for the various target groups (e.g. government departments, private organizations and social groups).

Interventions:
E3 Institutionalise Environmental Education at all levels of formal education
E4 Develop environmental awareness programmes for adults
E5 Establish the Brunei HOB Biodiversity field course

3.5.4 Preserve Indigenous Knowledge

There are eight indigenous ethnic groups in the Brunei HoB area, i.e. the Lun Bawang/Murut, Bisaya, Dusun, Iban, Belait, Kedayan, Tutong and Penan. While much of the population have migrated to the towns, those remaining in the villages are well taken care of by the government, and have access to basic amenities including health and education. However, it is widely believed that the current trend towards modernisation has led to a change in lifestyles, and the erosion of traditions and culture. These include knowledge of traditional farming systems, traditional uses of plants and non-timber forest products, handicrafts, languages, folk tales etc.

Although it is the right of the indigenous people to chose development and modernisation, a wealth of culture, traditions and wisdom may vanish within the next few decades with the passing of the older generation.

Until recently, little was known about indigenous cultures in Brunei, as there have been very few studies on this subject. In recent years, UBD researchers have conducted some ethnic studies particularly on the Dusun and Penan groups. However, there is still a gap in the documentation of indigenous knowledge, as the research findings have not been widely disseminated. Therefore, an effort needs to be made to document traditional indigenous knowledge in Brunei Darussalam.

Intervention
E6 Document indigenous knowledge

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention E1	**Develop the Brunei HoB National Communications Strategy**
Strategic thrust	3.5.2
Time frame	Short term
Lead agency	Brunei HoB Centre
Project partners	• Government information services • District offices • National media

Description

Rationale

The HoB initiative can only be achieved through the sustained support of all sectors of society including the government, public and private sector. In order to do this, the initiative has to be visible and communicate a clear message so that its vision, objectives and strategies are understood; or better yet, taken aboard with a sense of ownership. A well thought out communications strategy is needed.

Scope

A thorough plan would encompass strategies for communications with the various stakeholder groups including project partners, government departments, educational institutions, tour operators and communities living in the HoB. Various forms of media e.g. posters, magazines, newsletters, VCD and brochures may be used. It is important that a dedicated HoB website is set up, as this will have a global outreach.

It is suggested that a communications officer be appointed within the HoB centre. The Centre shall oversee the development of this strategy and follow up implementation.

The communications officer shall also be responsible for liaison with the communities living within the HoB area. For example, the unit may be required to sit in the various Mukim & Village Consultative Councils as an open channel of communication on HoB.

Cost : B$ 150,000
(employment of a full time communications officer or procurement of consultancy services)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention E2	**Develop the Brunei HoB community reforestation programme**
Strategic thrust	3.5.2
Time frame	Short to medium term
Lead agency	Forestry Department
Project partners	• Education Department • Brunei Tourism • International School Brunei

Description

Rationale

Tree planting is needed at HoB rehabilitation zones. It requires both trees and labour and is an excellent way of involving the community in the vision and work of HoB. The community outreach program on tree planting is a committed effort to rehabilitate forest in the HoB areas in Brunei. The objective is to enable all groups including the general public, schools, government departments, the private sector and tourists to carry out tree planting activities.

Scope

Suitable rehabilitation sites shall be identified (Zone 3), including sites identified for different planting regimes and tree species. For instance, sites near villages to be planted with fruit trees; sites within coastal forests to be planted coastal forest species etc. The Forestry Department will help to establish nurseries and propagate of seedlings for the various sites.

Follow-up activities may be incorporated to make the programme more interesting. For example, individual schools can be allowed to adopt specific sites where they may carry out weekly monitoring (e.g. to measure growth rates) and maintenance, as well as carrying out additional faunal and floral surveys in the area. This will help to inculcate a sense of caring and ownership of the specific area.

To add to this, IT may be utilised. Schools may be encouraged to start websites/blogs to share their experience both nationally and internationally.

Cost : B$ 350,000 (field equipment, seedlings, logistics, publicity)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention E3	**Institutionalise Environmental Education at all levels of formal education**
Strategic thrust	3.5.3
Time frame	Medium term
Lead agency	Ministry of Education
Project partners	• Environment, Parks and Recreation Department • Universiti Brunei Darussalam • Forestry Department

Description

Rationale

A national Environmental Education (EE) programme requires a national EE policy if it is to be sustained. The policy must then be translated into action.

Scope

The Ministry of Education shall develop a policy to integrate EE into the curriculum of pre-school, primary, secondary and tertiary levels. The policy shall address the following components:

- Development of EE curriculum framework for all levels of formal education
- Development and production of EE teaching materials
- Training key personnel from the Ministry of Education, tertiary institutions, teacher training institutions and schools.

The institutionalization of EE at all levels of formal education can be realized through the following steps:

- Organise multi-sectoral workshops to plan, design and formulate a multi-disciplinary curriculum framework for the integration of environmental topics at all levels
- Pilot-test the EE curriculum (particularly the objectives, content, learning activities and assessment procedures)
- Revise the EE curriculum and make necessary changes
- Prepare guidelines for the development and production of EE support materials in various formats (module, poster, multimedia, etc)
- Conduct workshops to develop EE support materials on the local and regional environment with the assistance from various experts
- Incorporate local and regional environmental issues, experiences and practices (e.g. HoB initiative) in the EE support materials
- Produce EE support materials for all levels of formal education
- Organize a series of training workshops for the key personnel from the Ministry of Education, tertiary institutions, teacher training institutions and schools on EE, using the support materials produced

Cost : B$ 200,000 (Short-term consultancy, workshops, training)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention E4	**Develop environmental awareness programmes for adults**
Strategic thrust	3.5.3
Time frame	Long term
Lead agency	Environment, Parks and Recreation Department
Project partners	• Forestry Department • Ministry of Education

Description

Rationale

To increase the general level of environmental awareness among the adult population, a long-term environmental awareness program may be developed. The approach is to develop short (1-2 hours long) training modules that may be conducted in-house by the personnel of the organization.

Scope

This approach will require competent and effective in-house trainers. Hence, focus will be on developing the capacity of a pool of trainers from the various target groups including community, private and public organisations. The trainers will then be charged with facilitating in-house programmes at their respective organisations, and consequently implementation of projects.

It is important that the programmes are relevant to the target audience, and use experiential learning methods as much as possible. For instance, the course should inculcate various lifestyle changes that would empower the target groups to make positive contributions, such as the reduction, recycling and reuse of office material, car pooling etc.

There are five stages in this programme:

1. Pre-implementation : Review existing EE programs or initiatives, i.e. fact-finding, data collection, gap analysis and strategic planning.

2. Module and resource development : Module and resource materials developed and improved following feedback.

3. Training of trainers/leaders : To train core group of volunteers from various organisations.

4. In-house training : The core group of volunteers will become in-house trainers for their respective organisations. They should also organise environmental initiatives and projects for their organisation.

5. Monitoring and Evaluation : The first few sessions should be monitored to assess the practicality of the training method and content, modules and resource materials.

Cost : B$ 100,000
(consultancy services to develop training module, conduct training, publications)

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention E5	**Establish the Brunei HOB Biodiversity field course**
Strategic thrust	3.6.3
Time frame	Medium to long term
Lead agency	Universiti Brunei Darussalam
Project partners	• Forestry Department – Facilitating • Brunei Tourism – Marketing
Benefits	
1 Generate local and international interest Brunei's biodiversity **2** Generate revenue for various sectors, in particular tourism and hospitality	
Description	
Rationale There is a global demand for field-courses and fieldwork that volunteers can be involved in. Some of this appears to be entirely commercial and may be unknown to the authorities in the host countries. (e.g., see info@travellersworldwide.com) Others may be linked to universities. There is an opportunity for Brunei to enter this market. It is proposed that UBD shall design and regularly run a short-term HOB biodiversity field course. The objective of this course is to provide graduate and undergraduate students the opportunity to take part in scientific field studies in Brunei, and to experience living and working in a field environment in the tropics. In addition, Brunei students would have the opportunity to participate, with their expenses being covered by the income from foreign participants. **Scope** The course shall be open to graduate and undergraduate students from overseas universities (and UBD). Arrangements would be made to allow them to qualify for credit hours at their respective universities. Students must fulfil set course requirements in order to earn the credit hours. Duration shall be around 2-3 weeks. Ideally, there should by one course offered per semester, with the students being exposed to a variety of studies, tasks and sites. For example: • Site 1: Small mammal trapping at a kerangas forest (1 week) • Site 2: Flora survey and mapping at a peat swamp forest (1 week) • Site 3: Park management at Ulu Temburong NP (1 week)	
Cost : B$ 250,000 (field equipment, training modules, logistics, publicity)	

SECTION 3 – STRATEGIES & INTERVENTIONS

Intervention E6	**Document indigenous knowledge**
Strategic thrust	3.5.4
Time frame	Short to medium term
Lead agency	Universiti Brunei Darussalam
Project partners	• Museums Department • Academy of Brunei Studies • Community bodies and leaders • HoB Centre

Description

Rationale

Valuable knowledge, especially in relation to the environment generally, to traditional agriculture and to the forest and its products, is being lost as indigenous people integrate with modern society and move away, geographically and culturally, from their roots. A concerted effort is needed if this knowledge is not going to be lost for ever.

Scope

An indigenous knowledge committee shall be formed comprising members from Academy of Brunei Studies, UBD lecturers, Museums Department, and indigenous community leaders. This committee shall oversee the overall documentation process, from collating existing information to conducting interviews with the local elderly.

Masters students may conduct both research work and desk studies (Some research papers on indigenous cultures are available from the UBD library). Interviews, especially with the older generation of the indigenous groups, shall be conducted to obtain first hand information.

Three types of outputs are envisaged from the exercise, i.e.

- Systematic documentation of indigenous knowledge,
- Showcase of various aspects of the knowledge for public awareness e.g. in the form of publications, exhibitions, television documentaries
- Modern day application of traditional knowledge (e.g. in agriculture or medicine)

Cost : B$ 150,000 (Researchers, logistics, publications)

This page has been left blank intentionally.

Native durian species, Temburong / D. Ong

SECTION 4
Management framework

SECTION 4 : MANAGEMENT FRAMEWORK

4.1 INTRODUCTION

The successful implementation of the strategies and interventions for the Brunei HoB requires a strong commitment from all stakeholders, a robust and effective management framework and the strong backing of the Government. The magnitude of the task is immense but with organisation and resolve, it is achievable. The country needs an institutional arrangement that can effectively steer and support translating the HoB PIF into successfully implemented programmes, both for the national endeavour and for the trilateral co-operation.

4.2 OVERALL GUIDANCE : THE NATIONAL HoB COUNCIL

A National HoB Council should be established to ensure the successful implementation of the Heart of Borneo Project Implementation Framework for Brunei Darussalam. It is recommended that the National HoB Council should be chaired by the Deputy Minister of Industry and Primary Resources (MIPR). The HoB Centre (see section 4.3 below) could serve as the Secretariat.

Given the diversity of tasks for the implementation for the HoB programmes, it may be appropriate that the Council also includes non-governmental organizations and the private sector. The aim here is to engage and empower the NGOs and the private sector to actively participate so that the HoB is seen as a programme involving the entire population of Brunei and not something executed purely by the Government.

The National HoB Council shall include representatives of the relevant government departments and co-operating organizations that have direct bearing on the successful implementation of the programme. Membership should be drawn from the following :

- Ministry of Industry and Primary Resources (Chair)
- Prime Minister's Office
- Ministry of Finance
- Ministry of Foreign Affairs and Trade
- Ministry of Development and Environment
- Ministry of Culture, Youth and Sports (Museums Department)
- Ministry of Defence
- University of Brunei Darussalam
- National Committee on the Environment
- Corporate/private sector representatives[1]
- NGOs

The recommended Terms of Reference for the National HoB Council are :

- Provide general guidance for the overall direction, management and timely implementation of the programmes for HoB.
- Facilitate and coordinate activities across relevant institutions and stakeholders.
- Prioritize programmes and interventions.

[1] Including "Platinum Sponsors". See section 4.5

- Raise funds from both within and outside the country.
- Oversee the operations of the HoB Centre.
- Report to the Leadership

4.3 THE NATIONAL HEART OF BORNEO CENTRE

The Brunei Heart of Borneo Centre (HoB Centre) is proposed as the main institution to facilitate the implementation of the HoB programmes. The HoB Centre should be more than just a secretariat. While it would be available to provide the Brunei National Secretariat (including HoB trilateral relations) or to assist the Forestry Department in this respect, it should also provide other functions including :

- Marketing and fundraising for the national HoB initiative.
- National clearing house for biodiversity information.
- Co-ordinating the planning, development, execution and monitoring of HoB projects and other interventions.
- Focal point for the environmental awareness programmes.
- Focal point for the community reforestation programme.
- A training centre for the rehabilitation of forests and wildlife habitat.
- Rehabilitation, captive breeding and reintroduction centre for wildlife of HoB, with visitor facilities[2].

It is proposed that the HoB Centre executive be established in an office in Bandar Seri Begawan for practical convenience in day-to-day running. Thereafter, it is envisaged that the technical functions might be located at a suitable site within the HoB area; with one option being at the yet-to-be-built National Tropical Biodiversity Centre in Mukim Sungai Liang.

4.4 INTERIM CO-ORDINATION

Whatever else happens, it is essential that the current momentum in the HoB initiative is not lost due to a hiatus in activity. It would therefore be prudent to make interim arrangements for a small unit to carry out the first steps of HoB implementation, during a two-to-three year period, under the guidance of the current National HoB Steering Committee for as long as it shall exist and thereafter under the HoB Council or whatever body the Government shall establish to steer HoB.

This unit would be responsible for:

1. Acting as the National HoB Secretariat, including providing the secretariat for the HoB Council, or assisting the Forestry Department in these functions.

2. Acting as the gatekeeper for general communications between Brunei's HoB effort and other parties.

3. Co-ordinating the planning and development of the National HoB Centre.
4. Marketing and fundraising for the national HoB initiative.

[2] Depending on where the HoB Centre is ultimately located, it may be advisable to use a different location, or locations, for species rehabilitation and re-introductions.

SECTION 4 : MANAGEMENT FRAMEWORK

5. Co-ordinating the planning, development, execution and monitoring of HoB projects and other interventions.

The Task Force recommends that the "Brunei Heart of Borneo Co-ordination Unit" be established as early as possible in 2008. Initially, it should be planned and budgeted for at least a two-year period, with an option for extension, if necessary. It will require the following:

1. Fully equipped office facilities in Bandar Seri Begawan, suitable for a staff of three professionals, two support staff and at any time two visitors on short-term attachment

2. Staff consisting of:

   i. The CEO.

   The CEO's job is to ensure the efficient implementation of the HoB Council's directives, as well as giving sound advice and other feedback to the Council.

   This is a very senior position for a capable and mature team leader, with a proven track record. He or she must have at least 15 years of relevant professional experience, and sufficient credibility to interact effectively at all levels of government, with the private sector, with the media, with counterparts in Indonesia and Malaysia, and with the global environmental community. He or she must be an excellent ambassador and advocate for HoB with a wide variety of audiences both inside and outside HoB. As the leader of a small unit, he or she must also be capable of "hands-on" involvement in the work, as may be necessary.

   ii. Project Cycle Manager

   The Project Cycle Manager will be responsible for ensuring and facilitating all aspects of project development, elaboration of support required (including funding), monitoring and reporting, and follow-up. He or she will also be responsible for the day-to-day work of running the secretariat functions of the Unit[3].

   This is management position for a person with at least five years of relevant professional experience. He or she must be well qualified in an environmental field (preferably at least at masters degree level), as well as having a flair for project administration and the use of such planning tools such as the logical framework.

   iii. Communications and Fundraising Executive

[3] WWF-Malaysia has developed an excellent model of this position over the years. It is recommended that the appointed person have a short training attachment there at the beginning.

The Communications and Fundraising Executive will be responsible for the day-to-day work of media relations (including record-keeping), editorial assistance for HoB publications (national or trilateral), packaging funding proposals for specific target agencies, corporations, individuals, etc., and preparing communications and fundraising briefings for the Chairman of the HoB Council and the Centre's CEO.

This is an executive position for a person with a flair for communication that includes strong (and quick) writing skills. Some professional environmental background would be preferable but is not essential. Ideally, the position would be best suited to a very bright young person, possibly with a bachelor's degree and only two or three years working experience. However, such people are very hard to find and the Director should be given leeway to explore other options, including part-time work from a more senior person and/or out-sourcing.

iv. Secretary

This is a crucial position for an experienced and energetic individual who will contribute importantly to the effectiveness of the three professional staff. The Secretary will provide a full range of standard secretarial services, including basic administration.

v. Driver

The responsibilities of this position will include normal driving, ensuring vehicle maintenance, errands and general office assistance.

3. A 4WD vehicle suitable for use both in town and outstation.

4. Operating budgets to include:

   i. staff costs (including recruitment, training & housing)
   ii. office set up, running costs and rent
   iii. vehicle costs
   iv. local travel
   v. international travel (Indonesia, Malaysia and global)[4]
   vi. contingency allowance

4.5 COSTING

4.5.1 Core costs of interim co-ordination

The interim office is expected to operate approximately until March 2010. Over the two year period, it is currently estimated that the office will require B$1.6 million to operate and sustain itself. This figure is currently being revisited in the hope of making savings.

[4] Has to allow for members of the team to attend trilateral and other meetings. Also, within the region, fundraising travel to ASEAN, ADB, etc HQs. Also global travel for fundraising purposes.

4.5.2 Estimated costs of interventions

Preliminary cost estimates have been given for each intervention in the previous chapter. These estimates are tabulated tallied in Table 4-1. Based on these figures, the total cost for the 36 interventions over 9 years is B$ 9.4 million.

It should be noted that these figures only include the basic costs (startup and three-year implementation costs) for each intervention, and do not include the costs for subsequent long term implementation, which may be substantial in some cases.

4.6 FUNDING AND FUNDS MANAGEMENT

Funding for the interim office is expected to come from:

- 50% Private Sector
- 50% Government

It is recommended that companies in Brunei be approached for financial and other forms of support for both core and project costs for the national HoB effort. Categories of partners should be established: e.g., Platinum, Gold, Silver and Bronze, defined by the amount of the sponsorship. The amounts involved have yet to be determined, but they should be substantial.

Recognition will be given to all partners on the website and on marketing materials. In addition, Platinum Members will be included in the Steering Committee and HOB Council once this is formed.

Note that one of the functions of the Interim Unit is to raise funds for HoB, not only for its own core costs but also for the projects and other interventions that will be needed for the full implementation of HoB in Brunei.

It is further recommended that a separate legal entity be established for the Brunei HoB Centre and the interim office. For ease of operation and to facilitate public-private partnership, it is suggested that a Brunei Heart of Borneo Trust be incorporated as a company limited by guarantee, with full tax deductibility and exemptions both for its own income and for donors. The Trust should be under the direct control of the Ministry of Industry & Primary Resources through its Registered Members and Board of Directors. Other agencies and individuals should be brought in as Members and Directors, at the discretion of the Ministry, taking account of the advice of the proposed HoB Council.

In addition to the functions outlined under sections 4.3 and 4.4 above, the Trust would hold and manage funds in the interests of the HoB initiative, giving project grants under the strict supervision of its Directors, much as – for example – WWF-Malaysia operates in that country. Transparency, integrity and professional expertise should be supervised and guaranteed by the Members and Directors, working through a Chief Executive who would also be the National HoB Co-ordination CEO, as described in section 4.4 above.

SECTION 4 : MANAGEMENT FRAMEWORK

Table 4-1 : Estimated costs of interventions

Intervention		Costs (B$)									Total cost per intervention (B$)
		Short term (2008-2010)			Medium term (2011-2013)			Long term (2014-2016)			
		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	
B1	Enhance legal and management framework for biodiversity conservation	250,000									**250,000**
B2	Develop institutional capacity for biodiversity conservation				200,000	200,000	100,000				**500,000**
B3	Establish the Brunei HoB 25 ha permanent forest dynamics research plot				150,000	75,000	75,000				**300,000**
B4	Survey of endangered cats in Brunei		150,000	75,000	75,000						**300,000**
B5	Survey of amphibians in Brunei				50,000	50,000	50,000				**150,000**
B6	Survey of insect biodiversity in Brunei				50,000	50,000	50,000				**150,000**
B7	Large mammal survey in the Inter-riverine Zone			100,000	75,000	75,000					**250,000**
B8	Survey of fish and aquatic invertebrates in Brunei				100,000	50,00	50,000				**200,000**
B9	Rapid assessment of the Protected Area System		300,000	200,000							**500,000**
B10	Gazette Belait Peat Swamp Complex as a Forest Reserve, and extend Ulu Mendaram Conservation Area							200,000			**200,000**
B11	Formulate a management plan for the Belait peat swamp forest				300,000	200,000					**500,000**
B12	Capacity-building and preparation of a national action plan for the wise use of peatlands and reduction of fire risk	300,000	200,000	100,000							**600,000**
B13	Conservation surveys and management of Kerangas forests			300,000	200,000						**500,000**
B14	Develop EIA process for the HoB area				200,000						**200,000**
B15	Generate legislation for biotechnology, including bio-prospecting				100,000						**100,000**
B16	Establish national Bio-prospecting Programme					200,000	200,000				**400,000**
B17	Study potential of carbon and biodiversity offsets		100,000								**100,000**
B18	Ulu Temburong National Park transboundary connectivity		50,000	50,000							**100,000**
B19	Sungei Ingei/Gunung Mulu transboundary park		100,000	500,000	200,000						**800,000**

SECTION 4 : MANAGEMENT FRAMEWORK

Intervention		Costs (B$)									Total cost per intervention (B$)
		Short term (2008-2010)			Medium term (2011-2013)			Long term (2014-2016)			
		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	
B20	Belait peat swamp forest transboundary connectivity				-						
B21	Integrated management of Brunei Bay			300,000							**300,000**
B22	Combat wildlife crime		250,000								**250,000**
B23	Needs assessment for science-based management for CITES				20,000	60,000					**80,000**
T1	Formulate the National Ecotourism Masterplan		250,000	150,000							**400,000**
T2	Establish the Brunei Green Guide Programme				200,000	100,000	100,000				**400,000**
T3	Enhance local community participation in nature tourism				100,000	50,000	50,000				**200,000**
T4	Facilitate birdwatcher tourism			100,000	50,000	50,000					**200,000**
T5	Facilitate culinary tourism - The Hearty Food of Borneo			100,000	50,000						**150,000**
T6	Facilitate macro-photography tourism - Brunei in Close-up			50,000							**50,000**
R1	Develop measures to minimise the impacts of sand extraction		80,000								**80,000**
E1	Develop the HoB national communications strategy	100,000	100,000								**200,000**
E2	Develop the HoB community reforestation programme		100,000	100,000	100,000						**300,000**
E3	Institutionalise Environmental Education at all levels of formal education					100,000	100,000				**200,000**
E4	Develop environmental awareness programmes for adults							50,000	50,000		**100,000**
E5	Establish the Brunei HOB Biodiversity field course						100,000	75,000	75,000		**250,000**
E6	Document indigenous knowledge		50,000	50,000	50,000						**150,000**
Total cost per year (B$)		**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Total**
		650,000	**1,730,000**	**2,175,000**	**2,270,000**	**1,210,000**	**875,000**	**325,000**	**125,000**	**0**	**9,410,000**

SECTION 4 : MANAGEMENT FRAMEWORK

This page has been left blank intentionally

Beach, Kuala Belait / D. Ong

SECTION 5
Bibliography

SECTION 5 : BIBLIOGRAPHY

Alan K. J. Tan (1998) *Preliminary Assessment of Brunei's Environmental Law.* Asia-Pacific Centre for Environmental Law, Faculty of Law, National University of Singapore.

Anderson, J.A.R. and Marsden, D. (1984) *Brunei Forest Resources and Strategic Planning Study*. 2 Volumes. Report to the Government of His Majesty the Sultan and Yang Di-Pertuan of Negara Brunei Darussalam.

ASEAN PCF (2007) *PCF Report Brunei Darussalam (Final Draft).* ASEAN Peer Consultation Framework (PCF) in Forestry (Pilot Exercise).

BSP (1996) *The Geology and Hydrocarbon Resources of Negara Brunei Darussalam*. Edited by S.T Sandal. Brunei Shell Petroleum Company Sendirian Berhad.

Bugna, S.C. (2002) A profile of the protected area system of Brunei Darussalam. Asean Biodiversity. 2, 4(Oct. - Dec. 02), p.40-43.

Caldecott, J.O. (1987) *International Co-operative Management of Brunei Bay*. Paper presented at the Conference on Wetland and Waterfowl Conservation in Asia. 23-28 February 1987, Malacca, Malaysia. IWRB & Interwader.

Cranbrook, Earl of & Edwards, D.S. (1994) *Belalong : A Tropical Rainforest*. Royal Geographical Society & Sun Tree Publishing.

Department of Agriculture. *Lokasi Kawasan Kemajuan Kemajuan (KKP).* Ministry of Industry and Primary Resources.

Department of Agriculture. Multifunctionality of Agriculture. Ministry of Industry and Primary Resources.

Department of Town and Country Planning (1987) *Negara Brunei Darussalam Master Plan (Main Volume).* Ministry of Development.

Department of Town and Country Planning (1987) *Negara Brunei Darussalam Master Plan (Rural Areas Development Plan).* Ministry of Development.

Dk Siti Nurbani Tengah (2006) *Brunei Darussalam: Environmental Law and Policy*. Paper presented at the Commonwealth seminar for the Asia region on the implementation of international environmental instruments and policy development. 2-8 October 2006, Malaysia.

Forestry Department (1995) *Development of Sawntimber Plantations in Brunei Darussalam*. Ministry of Industry and Primary Resources.

Forestry Department. *Forest Management Plan for Brunei Darussalam*. Part 1 - Overview of Forest Management in Brunei Darussalam. Ministry of Primary Industry and Resources.

Forestry Department. *Forest Management Plan for Brunei Darussalam*. Part 2 – Management Plan Operating Procedures for the Production Forest Reserves. Ministry of Industry and Primary Resources.

SECTION 5 : BIBLIOGRAPHY

Forestry Department (2003) *Preparation of a Masterplan for Brunei Tropical Biodiversity Centre (Interim Report).* Forestry Department, Ministry of Industry and Primary Resources.

Forestry Department (2004) *Forestry Sector 20-year Strategic Plan 2004-2023*. Ministry of Industry and Primary Resources.

Forestry Department (2004) *Preparation of a Masterplan for Brunei Tropical Biodiversity Centre (Final Report).* Forestry Department, Ministry of Industry and Primary Resources.

Forestry Department (2007) *Strategic Framework 2006-2010*. Ministry of Industry and Primary Resources. PowerPoint Slides.

Government of Brunei Darussalam: Laws of Brunei. Revised Edition 1984. *Chapter 40: Land Code*

Government of Brunei Darussalam: Laws of Brunei. Revised Edition 1984. *Chapter 102: Wild Life Protection.*

Government of Brunei Darussalam: Laws of Brunei. Revised Edition 2002. *Chapter 46: Forest.*

Government of Brunei Darussalam: Laws of Brunei. Revised Edition 2002. *Chapter 31: Antiquities and Treasure Trove Act.*

Government of Brunei Darussalam: Brunei Darussalam Government Gazette. *Chapter 61: Fisheries Act.*

Jurutera Tempatan (2005) *National Masterplan Review : Sectoral Paper 7 (Forestry & Wildlife).* Report submitted to Town and Country Planning Department, Ministry of Development.

Kamariah A.S. and Becker, P. (1991) *Ecotourism and Conservation: Resolving the Conflict*. Paper presented at Seminar on Promoting Development Opportunities in Ecotourism, Forest Conservation and Biodiversity Management, 18-19 December 1991, Ministry of Industry and Primary Resources, Bandar Seri Begawan, Brunei Darussalam.

Kobayashi, S. (1998) *Forest structure and regeneration process of peat swamp Alan forests (Shorea albida) in Brunei Darussalam.* In: Proceedings of the Second International Symposium on Asian Tropical Forest Management. PUSREHUT Special Publication. 166-187.

Lim, H.S. (1996) *Land Policies and Planning in Brunei Darussalam. Purih: A Collection of Essay on Brunei Darussalam*. Akademi Pengajian Brunei, Universiti Brunei Darussalam.

Mahmud Yussof (1990) *Basic guidelines for logging in Mixed Dipterocarp Forest in Negara Brunei Darussalam.* Ministry of Industry and Primary Resources. Unpublished.

SECTION 5 : BIBLIOGRAPHY

Mahmud Yussof (2007) *HoB Centre in Brunei Darussalam: Its Conceptual Establishment*. Ministry of Industry and Primary Resources. Unpublished.

Mittermeier, R.A. (1982) *Brunei Protects its Wildlife*. Borneo Research Bulletin 14(2): 85-87.

MIPR, Forestry Department: *National Forestry Policy.*

MIPR (1998) *Tourism Masterplan for Brunei Darussalam*. Ministry of Industry and Primary Resources.

MIPR (2006) *Heart of Borneo – Brunei National Planning Workshop*. Bandar Seri Begawan. 25th & 26th May 2006.

MWH (2005) *Sungai Tutong Catchment Environmental Study*. Report submitted by MWH New Zealand Ltd. to Department of Environment, Parks and Recreation, Ministry of Development.

Museums Department. *Wildlife Sanctuaries of Brunei Darussalam*. PowerPoint Presentation. Ministry of Culture, Youth and Sports.

Phillips, V.D. (1998) *Peatswamp ecology and sustainable development in Borneo*. In: Biodivesity and Conservation 7, p651-671. Chapman & Hall.

Public Works Department. *Development of integrated water resources management in Brunei Darussalam*. PowerPoint presentation. Ministry of Development.

Sirinanda, K.U. (1992) *Biophysical Environment of Brunei Darussalam*. Sumbangsih UBD: Esei-esei Mengenai Negara Brunei Darussalam. Editor-in-Chief: Dato Seri Laila Jasa Awang Haji Abu Bakar bin Haji Apong. Akademi Pengajian Brunei, Universiti Brunei Darussalam.

Wong, K.M. (1990) *Environmental Degradation in Brunei's Coastal Areas: Perspectives Important to Planning and Impact Assessments*. Seminar on Environmental Planning 12-13 December 1990.

Wong, K.M. (1990) *In Brunei Forests*. Forestry Department, Ministry of Industry and Primary Resources.

Wong, K.M. and Kamariah, A.S. (1999). *Forests and Trees of Brunei Darussalam*. Universiti Brunei Darussalam.

Wong, T.M. (1989) *The Forest Reserves of Brunei Darussalam*. Bulletin of the Brunei Nature Society. Vol. 2(2).

Zuraidah Kamis (2005) *Biodiversity Action Plan for Anduki Forest Reserve, Brunei Darussalam*. Brunei Shell Petroleum.

SECTION 5 : BIBLIOGRAPHY

Websites

ASEAN Centre for Biodiversity
http://aseanbiodiversity.org/

Department of Environment, Parks and Recreation
http://www.env.gov.bn/

Forestry Department
http://www.forestry.gov.bn/

Penaga Natural History Society
http://www.bsp.com.bn/panagaclub/pnhs/

Petroleum unit
http://www.petroleum-unit.gov.bn/oil_gas.htm

1992 Protected Areas of the World : A review of national systems. BRUNEI DARUSSALAM
http://aseanbiodiversity.org/cgi-bin/abiss.exe/ldnew?SID=1300645883&iso3=BRN&ld=ctry/law_md.htm