

THE CURRENT STATUS OF BIODIVERSITY CONSERVATION IN MALAYSIA

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PROPOSED CONTENTS

- Definition of biodiversity revisited
- Malaysia as a Megabiodiversity country
- *Ex situ* and *in situ* conservation up-dated
- Biodiversity Policy and legislations
- Current developments in biodiversity conservation, addressing natural resources & Sustainable development
- Challenges in biodiversity conservation in adapting to climate change

ECOSYSTEM DIVERSITY

- **Climatic Formations :** Lowland dipterocarp forest, Hill dipterocarp forest & Upper dipterocarp forest, Montane oak forest & Montane Ericaceous forests
- **Edaphic Formations :** Mangrove swamp forests, Beach forests, Peat swamp forests, Riparian forests, Heath forests, Limestone hill forests
- **Biotic Formations :** Schima-bamboo Forests & Gelam swamp forests
- **Others :** Coastal forests, incl. regenerated secondary forests

- **Mangrove & Peat swamp forests**

A resource under-estimated by most stake-holders including policy makers & industrialists

- **Fresh water swamp forests - Much has been converted to other land-use**

- **Peat swamp forests – the full potential is yet to be realised yet threatened**

- **Man-made forests incl. plantations**





An example of deciduous forest in Langkawi



Limestone outcrop – evergreen forest – mangrove-limestone forest

SPECIES DIVERSITY

- **FLORA**
 - Flowering plants ca. 12,500-15,000 species
 - Ferns and Fern-allies ca. 1,159 species
 - Mosses ca. 562 species in PM; other bryophytes ?
 - Lichens ??
 - Algae ?? – Freshwater & marine algae
 - Fungi ca. 1,400 species

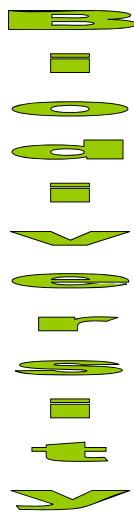


Value & benefits of Biodiversity

The value of Biodiversity was estimated as US33trillion ?

Ecosystem services

- Protection of Water Resources
- Soil formation and protection
- Nutrient Storage and recycling
- Pollution breakdown and absorption
- Climate stability
- Maintenance of ecosystems



Biological Resources

- Medicinal Resources
- Wood Products
- Breeding Stocks (Biotechnology)

Social & Aesthetic Benefits

- Research & Education
- Recreational
- Cultural Values

What do we know?

- **Flora**
 - **Ridleys's Materials (1898-1907) & Flora (1922-1925) - >6,000 species**
 - **Turner's Catalogue (1995) - >8,500 species**
 - **Tree Flora of Malaya (1972-1989) – 2,830 species**
 - **Tree Flora of Sabah & Sarawak (1996-now)**
 - **Flora of Peninsular Malaysia**
- **Fauna**
 - **We have no equivalents excepts for**
 - **Freshwater fishes (Azmi & Ambak)**
 - **Mammals 220 species**
 - **Birds >870 species**
 - **Herpetofauna**
 - **Moths & Butterflies**
 - **Other invertebrates**

MALAYSIA AND BIODIVERSITY



Fauna		Species	Flora		Species
Mammals	286		Flowering plants	15,000	
Birds	736		Orchids	>3,000	
Reptiles	268		Palms	536	
Amphibians	158		Ferns	1,167	
Marine fishes	4,000		Fungi	>700	
Freshwater fishes	449		Mosses	832	
Invertebrates	150,000				

Microorganisms including invertebrates:

Diversity in *Nepenthes*



GENETIC DIVERSITY

heritable variation within genes

ITS IMPORTANCE

- Potential of a species to respond and adapt to environmental changes
- Understanding organic evolution and population structure
- Potential in breeding for better breeds of plants and animals

IN MALAYSIA IT IS STILL AT ITS INFANCY
THOUGH BIOTECHNOLOGY IS A PRIORITISED

***In situ* conservation in Sabah**

- Forestry Department
- Sabak Parks
- Department of Wildlife
- Sabah Foundation
- Towards 1 million ha



***In situ* Conservation in Sarawak**

- Forestry Department
- Sarawak Biodiversity Centre
- Towards 1 million ha

**Aesthetic value
Scientific value
Heritage value
Deforestations
Development
Corridors**

***In situ* conservation in Peninsular Malaysia**

Department of Forestry -

Custodians of Permanent Reserved Forests and State Parks

Department of Wildlife & National Parks

Custodian of National Parks, Wildlife Sanctuaries etc

Department of Marine Parks

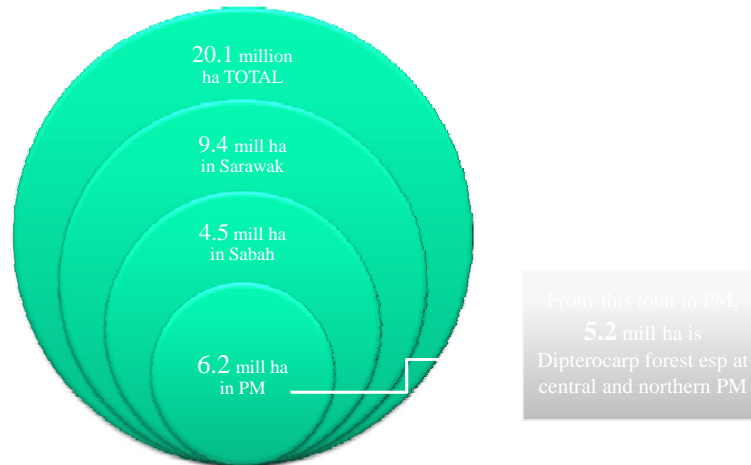
Custodians of marine parks

Other departments

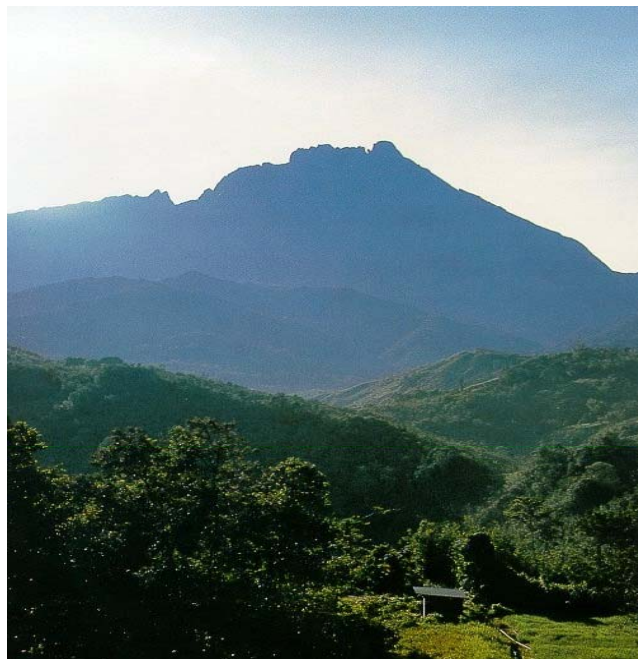
The role of state governments and local governments

**Johor, Selangor & Perak with their own State parks
Corporations**

COVERAGE NATURAL FORESTS IN MALAYSIA



A majestic scenario at the foot of Mt. Kinabalu a destination for eco-tourists that ensures some economic returns to Sabah and Malaysia



Some indicators of progress in our understanding of biodiversity conservation

- 1980's WWF Conservation Strategies for each state – shelved and unimplemented by EPU
- New growth centres + rapid urbanisation
- Towards Industrialisation
- GDP 1991-2007 – averaging 8%
- New Economic Policy
- Five-Year Development Plan
- New patterns of consumerism
- New Economic Initiatives etc etc

IMPLICATIONS on the country's policy

- Population increase & Rural-Urban migration
- New Migrants
- Demand for natural resources
- Responding to western globalisation
- Decline in environmental quality
- Slow incorporation of Green Economy
- Rise of brown issues
- Natural resources & biodiversity decline

MALAYSIA GDP BY SECTOR

	1970 RM million	1995
Agriculture, Forestry and Fishing	6,254	16,406
Manufacturing	2,994	39,825
Finance, Insurance, Real Estate & Services	1,854	12,884
Wholesale, Retail trade, Hotels & Restaurant	2,469	14,568
Government services	2,005	11,683
TOTAL ADDED VALUE	20,818	123,867

PROTECTED AREAS in Million ha

	NP	WLBS	Total
• Peninsular Malaysia	• 0.43	0.31	0.74
• Sabah	• 0.25	0.14	0.39
• Sarawak	• 0.08	0.18	0.26
• TOTAL	• 0.76	0.63	1.39





Mangroves at Pulau Langkawi – the government is spending millions in R & D and planting

**DISTRIBUTION OF TREE COVER 1994
MILLION HA**

	• Land Area	NatFor	PlanFor	AgricTrCr
• Peninsular Malaysia	• 13.16	5.95	0.07	3.41
• Sabah	• 7.37	4.41	0.09	0.64
• Sarawak	• 12.33	8.65	0.01	0.39
• TOTAL	• 32.86	19.01	0.17	4.44

MATANG MSF – A CASE

ITEM	REVENUE	NOTES
Charcoal premium & royalty	955,821	Premium RM2/t Royalty RM184/Kiln
Pole premium		Premium RM13/ha
Thinning I	130,459	Royalty RM3/30 m
Thinning II	115,771	
Others	30,330	
Total	1,232,775	
Cost of Reforest.	155,775	
Cost of Operation	716,384	
Nett Revenue	36,022	

GREEN ECONOMY & SUSTAINABLE DEVELOPMENT

- **Natural capital** – natural resources, living systems and ecosystem services
- **Human capital** – labour, skill and knowledge, culture & organisation
- **Manufactured capital** – infrastructure, technology, factories, machines
- **Financial capital** – cash, investment

FOREST MANAGEMENT – A CASE STUDY

- Products from timber, palm oil, food and tourism are moving towards Green Economy
- **Eco-certification, ISO 14000**
- Calls for biodiversity conservation and minimising environmental degradation through Sustainable Forest Management (SFM)

Mangroves



Sustainable Forest Management

- 50% Forest cover = 18.9 mil. ha
- 14.1 mil. ha designated as Permanent Forest Reserve (PFR)
- Balance between Production, Social obligation, Protection and Education
- 3.39 mil. ha designated as Protection Forests – National or State Parks, Wildlife Sanctuaries & Natural Reserves



Sustainable Forest Management

- Annual coupe for Peninsular Malaysia is set at 46,040 ha – a few states broke this
- Environmental Quality Act 1974 amended to include EIA for activities involving forest land use in 1988
- Reduce Impact Logging – an answer?
- Monitoring through GIS, Remote Sensing
- Good practice and certification

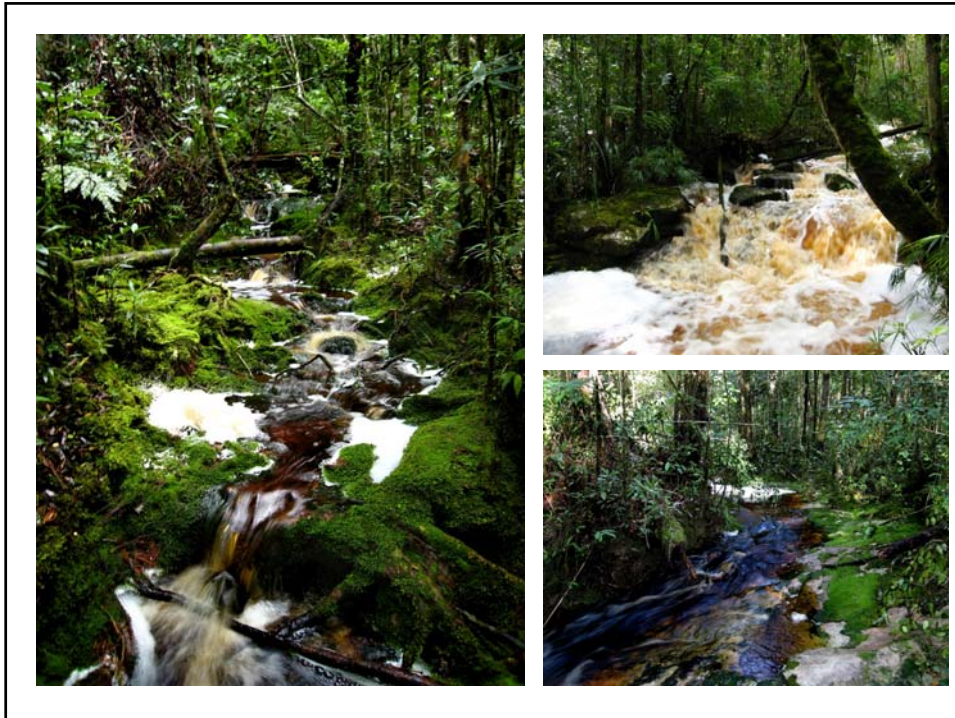


SFM – Sabah and Sarawak case

- **Production – confined to lowlands and moderately steep slopes of < 25 degree, industrial timber plantations in degraded areas**
- **Rise of plantation forests**
- **Conservation – areas >25 degree, water catchment areas, high density of wildlife**
- **Recreation – natural aesthetic values**
- **Community Forestry – traditional land use**

SFM – GREEN ECONOMY

- **Setting up long-term goals in forest management**
- **Resource security**
- **Sustainable utilisation of timber and timber-based products**
- **Multiple use of forest products – beyond logs**
- **Protection of environmentally sensitive areas**
- **Environmentally sound technology in harvesting**
- **Resource development by enrichment & rehabilitation**
- **Local community participation**
- **Regulatory and monitoring mechanisms**



ECOTOURISM

- **Potential spots for ecotourism and Recreation**
- **National and State parks**
- **Botanical Sanctuaries** – Pulau Pinang, Taiping, including ethnobotanical gardens
- **Rafflesia Sanctuary** – Tanbunan (Sabah) and Ulu Geroh (Perak)
- **Ginger Gardens** – Poring (Sabah)
- **Orchid Gardens** – Poring (Sabah), Semenggoh (Sarawak), Putrajaya
- **Aviary and animal farms**

Impact of tourism on the natural environment

ECOSYSTEM	IMPACTS
• Marine Parks and Islands	Deterioration of ground water & increase in marine pollution
• Forested areas and Parks	Effects on wildlife and trails Mass clearing of forests
• Mangrove swamps	Removal of trees, changes in hydrology, waste dumping
• Limestone hills and Caves	Affects of temperature and humidity changes, caves drying out
• Rivers, Waterfalls and Lakes	Changes in hydrology, littering & waste releasing

GOVERNMENT INSTRUMENTS

- **National Environment Policy 2002**
the goal is to achieve sustainable development
- **National Biodiversity Policy 1998**
to transform Malaysia into a Centre of Excellence in Biodiversity conservation and utilisation
- **National Forestry Policy 1978**
sound and sustainable forest management
- **National Agriculture Policy 1992**
sustainable agriculture, food security
- **National Policy on Domestic Animal Diversity**

LEGISLATION

- Protection of Wildlife Act 1972
- National Forestry Act 1984
- Fisheries Act 1985
- National Parks Act 1980
- Environmental Quality Act 1974
- Sabah and Sarawak have their own legislative Acts/Ordinances

National Biological Diversity Policy 1998

.....To conserve Malaysia's biological diversity and to ensure that its components are utilised in a sustainable manner for the continued progress and socio-economic development of the nations.





Biodiversity & Knowledge base

- **Knowledge on ecosystem functions would create ecotourism potential**
- **Knowledge of species diversity would create sustainable ecotourism**
- ***Paphiopedilum, Rafflesia, Nepenthes* are some of the genera with icon species**
- **In parallel with the the fauna icons such as Orang Utan, proboscis monkey, etc**



A revisit

- **Bidin, A. A. & A. Latiff. 1995. The status of terrestrial biodiversity in Malaysia. In : A. H. Zakri (Ed.). *Prospects in Biodiversity Prospecting*. Pp. 59-76. Genetic Society of Malaysia & UKM**
- **Parris, B. S. & A. Latiff. 1997. Towards a pteridophyte flora of Malaysia : A provisional checklist of taxa. *Malayan Nature Journal* 50 : 235-280**

Biodiversity & Conservation

- It is only through conservation efforts by the Federal, State and Local governments that could ensure the survival of our ecosystem, species and genetic diversity
- Wild species diversity that have relatives to agricultural races are important
- Nature Conservancy



Biodiversity & Public

- **Public participation at all levels also ensures conservation of pristine rural landscapes, species survival and more importantly the genomes that could become templates for the progress of biotechnology**
- **RM9 in particular gives emphasis on plant biotechnology**
- **RM10 VARIED BUT NO PRIORITY ON BIODIVERSITY**

Biodiversity & Climate Change

- Mutual concerns
- Depletion and degradation of quality of biodiversity impact ecotourism and sustainable utilisation
- Possible loss of ecosystems and species which are susceptible to temperature rise and loss of food sources

POSSIBLE CHALLENGES

- CALL FOR ADAPTATION MEASURES
- MINIMISE LONG TERM IMPACTS
- REDD
- FOR A SMALL COUNTRY THERE IS A LIMITED ACTIONS THAT WE COULD TAKE TO MAKE A SIGNIFICANT IMPACT
- DATA IS SCARSE
- ROLE OF G + NGO + NGI
- LOCAL AGENDA 21 MUCH TO BE DESIRED



CONCLUSION

- UNLIKE OTHER ASPECTS
- THE IMPACTS ON BIODIVERSITY ARE DIFFICULT TO MEASURE
- COULD BE MONITORED
- REQUIRED A LONG-TERM NATIONAL STRATEGY
- DIRECTED R & D



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