



Appendix K

Country Paper: Malaysia

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Prior to her work in Malaysia, Ms. Linatoc was Science Research Specialist/Ecosystem Management Specialist at the ASEAN Regional Centre for Biodiversity Conservation (ARCBC), and as a Forester in the Laguna CENRO of the Department of Environment and Natural Resources, both in the Philippines.

MALAYSIA'S CURRENT POLICY AND RESEARCH INITIATIVES TOWARD CLIMATE CHANGE – IMPACTS TO BIODIVERSITY

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Maryati Mohamed



International Conference-Workshop on Biodiversity and Climate Change in Southeast Asia: Adaptation and Mitigation, 19-20 February 2008, Manila

Realizing Challenges, Exploring Opportunities

Proceedings of the International Conference-Workshop on Biodiversity and Climate Change in Southeast Asia: Adaptation and Mitigation

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Realizing Challenges, Exploring Opportunities

352

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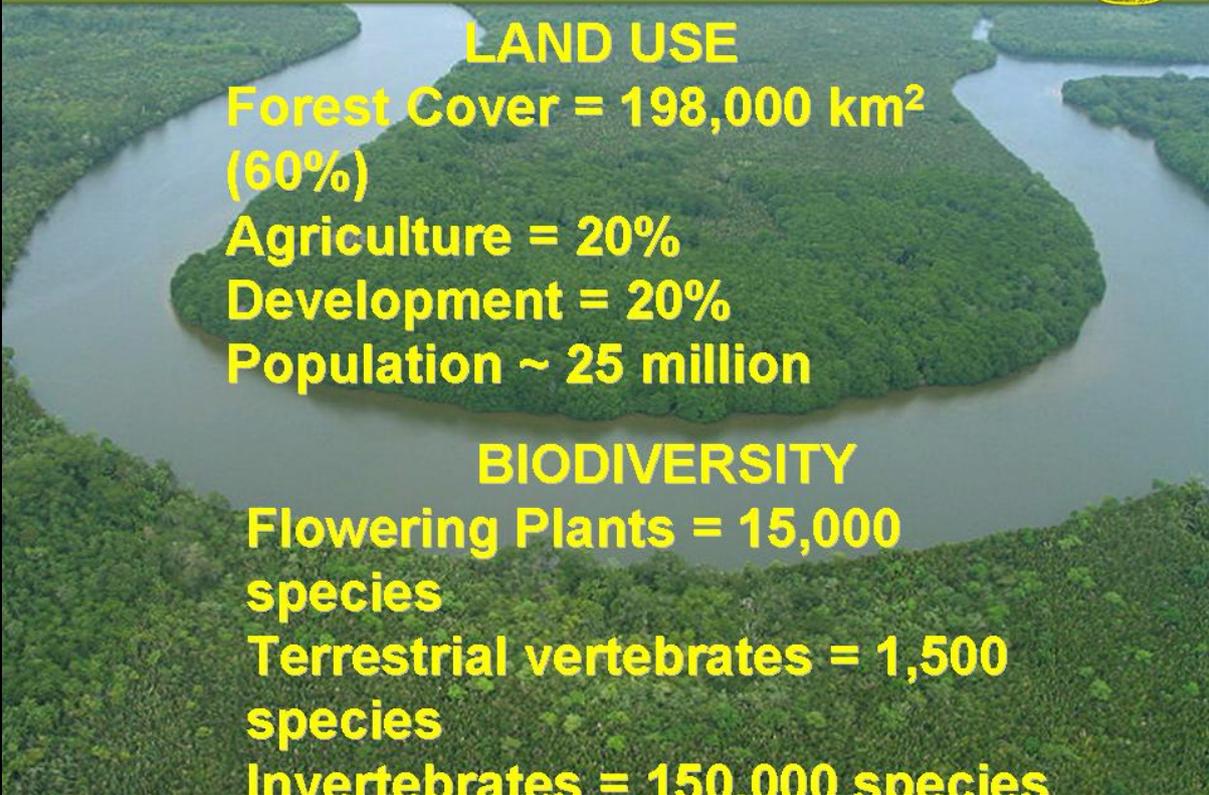


Realizing Challenges, Exploring Opportunities

353

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 **COUNTRY PROFILE** 

LAND USE
Forest Cover = 198,000 km²
(60%)
Agriculture = 20%
Development = 20%
Population ~ 25 million

BIODIVERSITY
Flowering Plants = 15,000
species
Terrestrial vertebrates = 1,500
species
Invertebrates = 150,000 species



 **COUNTRY PROFILE** 

- **Annual export earning from the forestry sector = US\$4.4 billion**
- **Improved conservation and management practices:**
 - **skills and capacities**
 - **research and development**
 - **cooperation in regional and global efforts and multilateral environmental agreements**



COUNTRY PROFILE



- **1970s – Regulatory and non-regulatory measure to restore balance to the goals of socio-economic and environmental sustainability**
- **Long-term and short-term development plans (i.e. Malaysia 5-yr Development Plan, Vision 2020)**
- **Prevention and control of pollution and other envt'l degradation, land-use planning, etc.**
- **Signatories to various environmental international agreements (CBD, Ramsar**



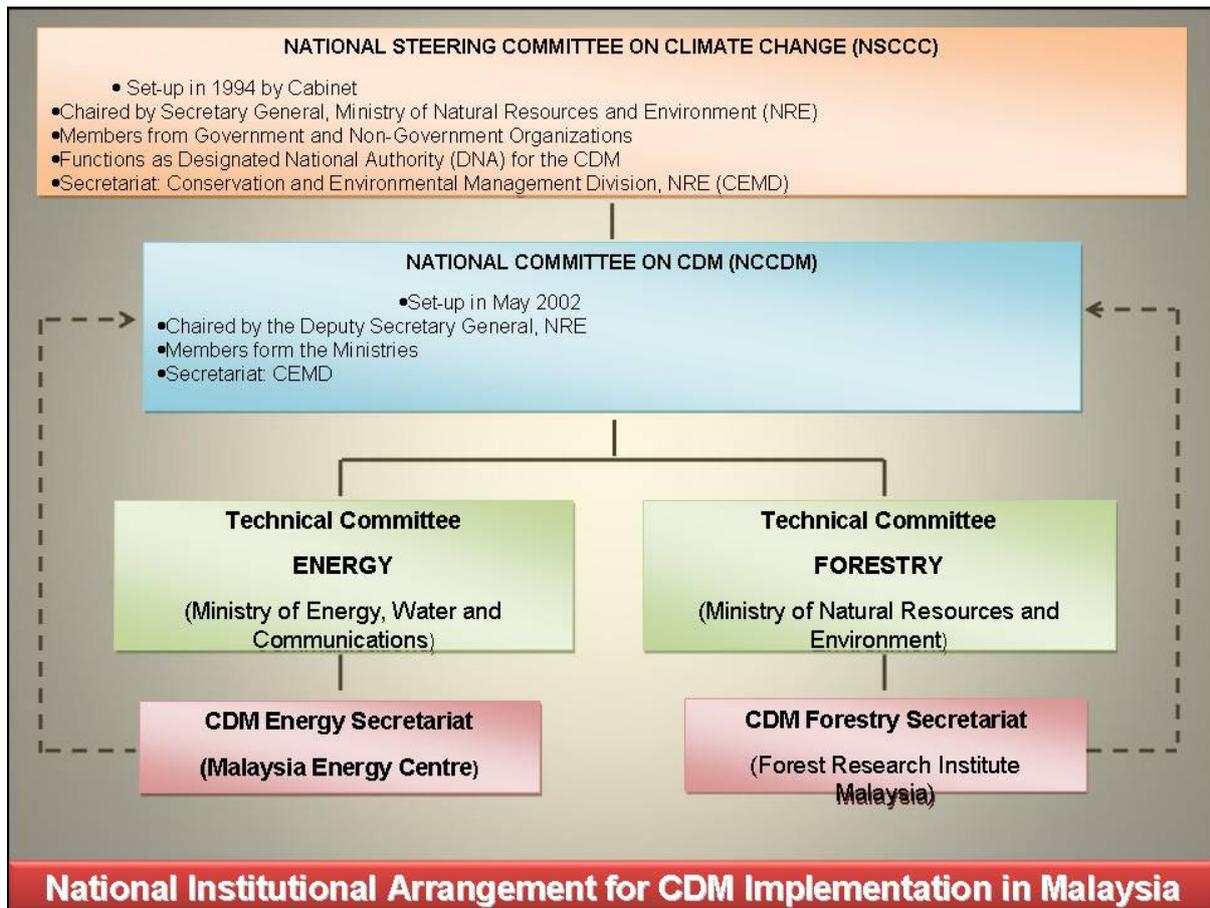
 **CLEAN DEVELOPMENT** 

MECHANISM

CDM POTENTIAL IN MALAYSIA

1. Renewable energy projects
2. Industrial energy efficiency
3. Supply and demand side energy efficiency
4. Landfill management
5. Fuel switch to less carbon-intensive fuels
6. Biogas to energy
7. Reduced flaring and venting in the oil and gas sectors
8. Land-use, land-use







 CLEAN DEVELOPMENT 	
MECHANISM	GENERAL CRITERIA
	<ol style="list-style-type: none">1. Support sustainable policies in Malaysia2. Involve participation of Annex 1 Party/Parties3. Provide technology transfer benefits and/or improvement in technology4. Fulfill all conditions underlined by the CDM Executive Board5. Justifiable



 **CLEAN DEVELOPMENT** 

MECHANISM

CDM POTENTIAL IN MALAYSIA FORESTRY SECTOR

- Capitalize on the potential of degraded areas and their carbon capacity
- Lobbying to international markets (i.e. Annex 1 Parties)
- CDM Energy: 320,000 CERs = US\$3.1 M)



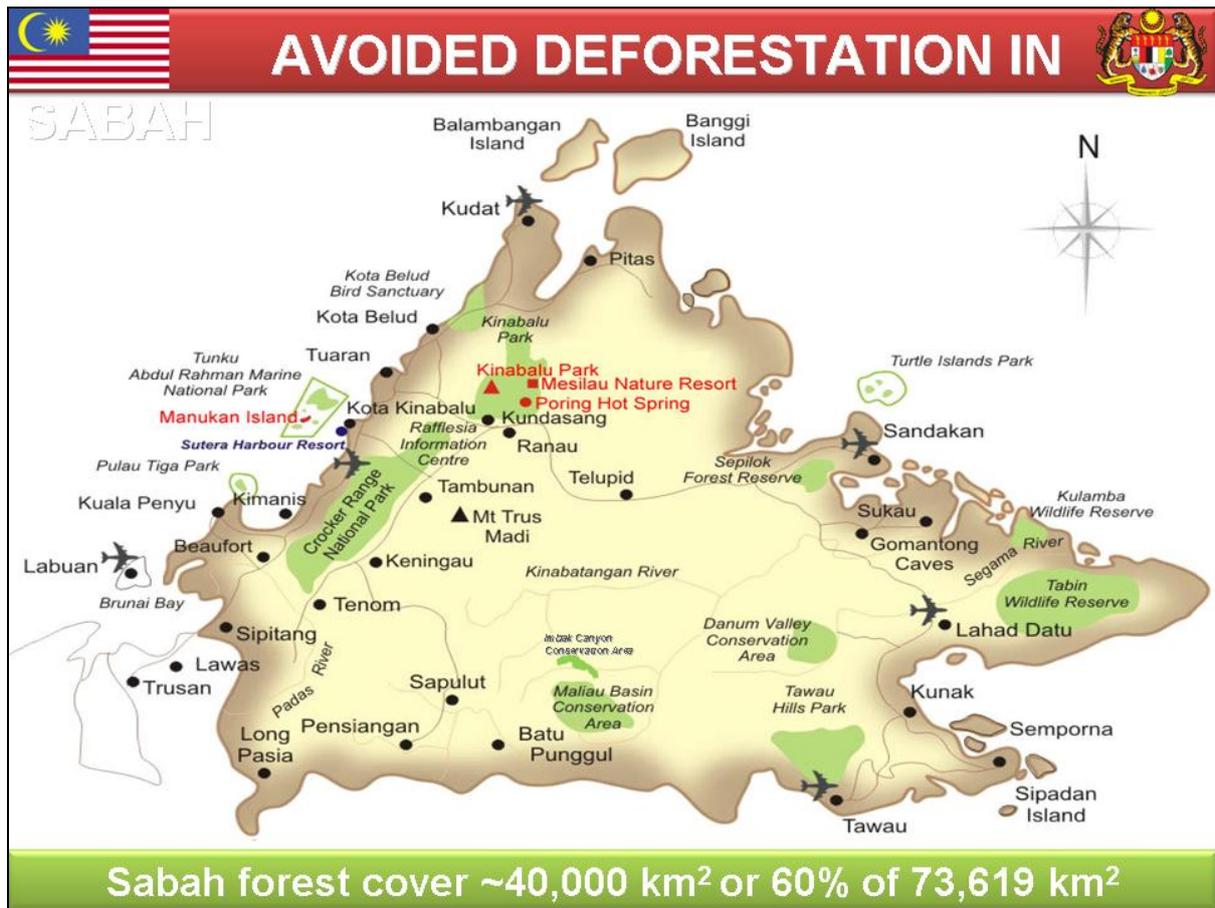


 **MARKETING OF BIODIVERSITY** 

CREDITS



- In collaboration between Sabah government (Sabah Foundation) and New Forests Pty Ltd; October 2007
- To protect 34,000 ha – Malua Forest Reserve
- Buyers: oil palm companies/ producers, energy companies, biodiesel businesses, etc.



Realizing Challenges, Exploring Opportunities

362

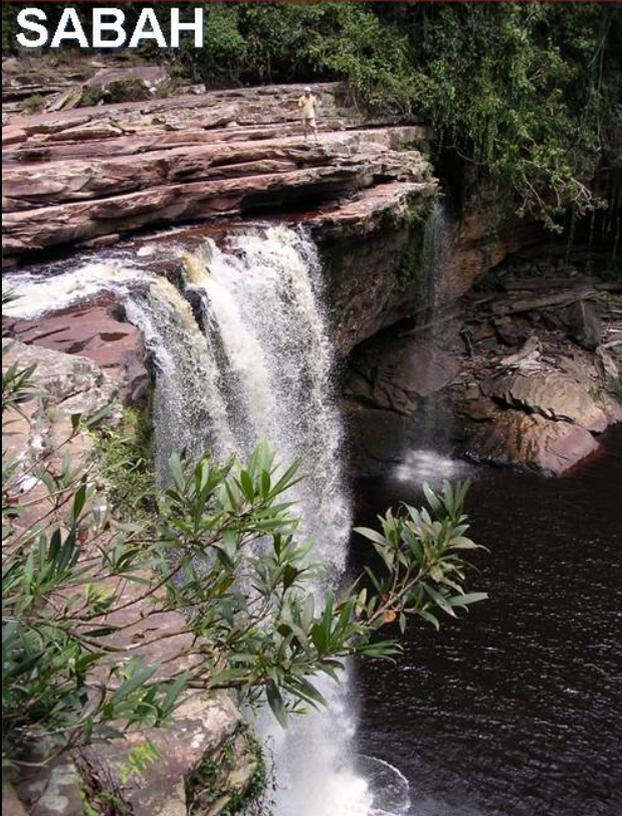
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 **AVOIDED DEFORESTATION IN** 

SABAH



Designation of Conservation Areas and Carbon Sequestration Programmes

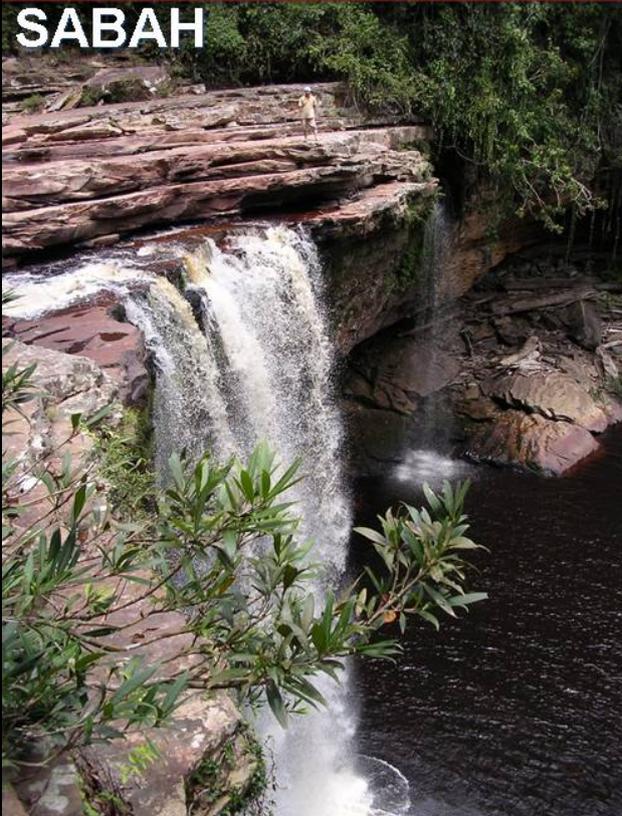
- Danum Valley Conservation Area = 438 km²
- Maliau Basin Conservation Area = 588.4 km²
- Imbak Canyon Conservation Area = 300 km²

Part of the 10,000 km² timber concession of Yayasan Sabah (Sabah



 **AVOIDED DEFORESTATION IN** 

SABAH



Designation of Conservation Areas and Carbon Sequestration Programmes

In Danum Valley:

- Innoprise-Face Foundation Rainforest Rehabilitation Project (INFAPRO) – rehabilitation of 25,000 ha of degraded forest through enrichment planting
- Reduced Impact Logging (RIL) project – reduce incidental damage to soil and other vegetation by 50%



 **AVOIDED DEFORESTATION IN** 

SABAH



Sabah Biodiversity Project

- UK-SEARRP assisted project; 500-ha of logged-over area
- Incorporated biodiversity issues in the planning of rainforest rehabilitation programmes
- Use 16 species of dipterocarps
- Examines how diversity of replanted tropical forest affects timber production.



 **AVOIDED DEFORESTATION IN** 

SABAH

Bornean Biodiversity and Ecosystem Conservation (BBEC) Programme

- State government of Sabah, Universiti Malaysia Sabah and JICA
 - Crocker Range Park
 - Tabin and Kulamba Wildlife Reserves
 - Lower Segama Wildlife Conservation Area
 - Lower Kinabatangan Wildlife Sanctuary
 - Maliau Basin Forest Reserve

3,735 km² or 5% of Sabah's





 **UNIVERSITY OF THE PHILIPPINES - MANILA**

BIOGENIC VOLATILE ORGANIC COMPOUNDS

- carbon-containing compounds; also known as non-methane volatile organic compounds
- Colorless, low molecular weight compounds that easily vaporize at room temperature
- Produced in many different plant tissues and various physiological processes

VOLATILE ORGANIC COMPOUNDS (VOCs)

↓ ↓

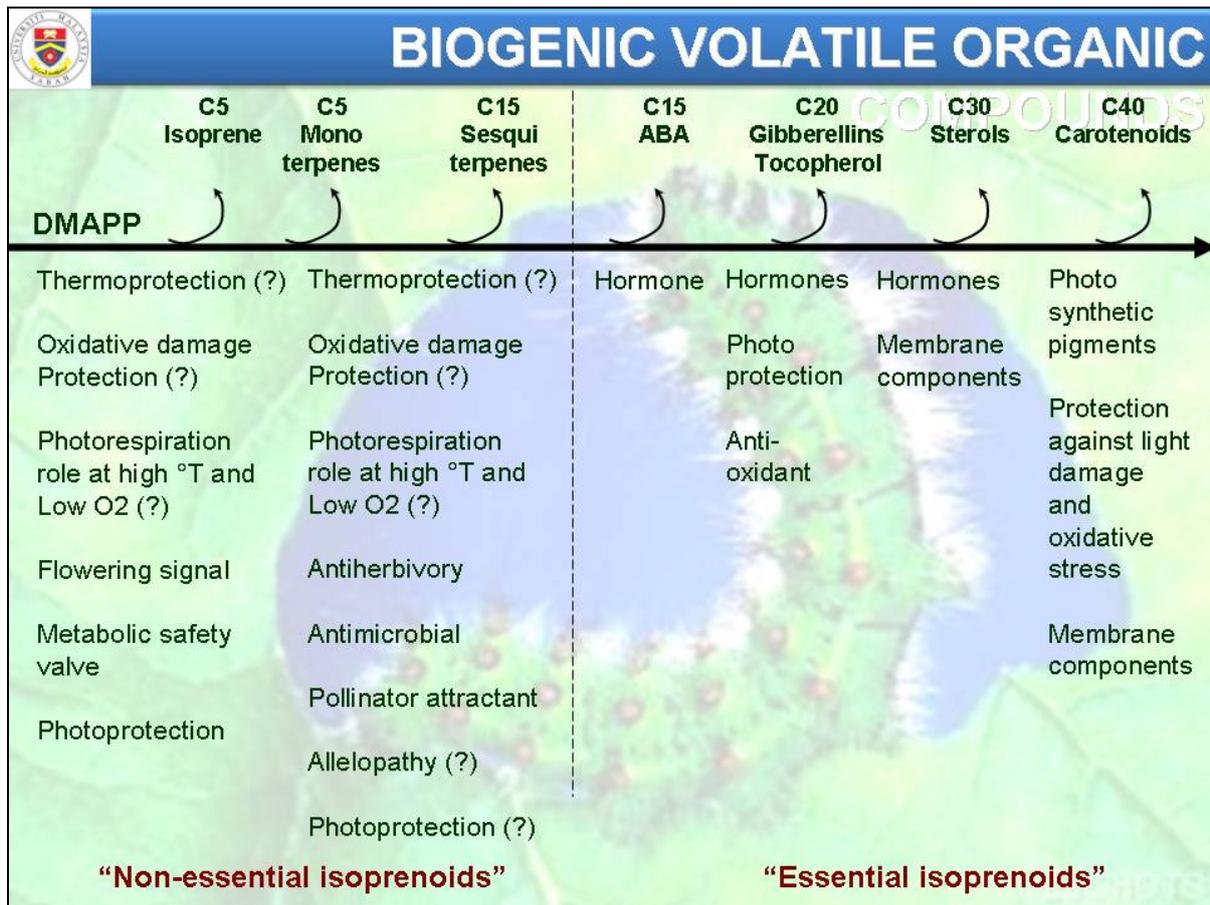
BIOGENIC 1.2×10^{15} g C / year	>	ANTHROPOGENIC C
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BIOGENIC VOLATILE ORGANIC COMPOUNDS

Why do plants emit VOCs?

- Stabilize and protect photosynthetic membranes from high temperature episodes ($\sim 40^{\circ}\text{C}$) and excessive visible lights incidence
- Emission of VOCs represents a metabolic 'safety valve' by preventing unnecessary sequestration of phosphates by removing plant's excess carbon
- Produced and emitted when plants are attacked by herbivores
- Act as insect aggregation and disaggregation pheromones
- Exhibit allelopathic relationship between plants





 **BIOGENIC VOLATILE ORGANIC COMPOUNDS**
ATMOSPHERIC CHEMISTRY

leads to the accumulation of methane and other GHGs

↑ ↑
decrease in concentration of OH

↑ ↑
hydrocarbon + nitrogen oxides = OZONE

Ozone is not directly produced and emitted by human activities but are rather produced in the atmosphere as a result of interactions of compounds that are emitted by human activities

BVOCs are hydrocarbons





 BIOGENIC VOLATILE ORGANIC					
Atmospheric Lifetime of volatile organic compounds					
Name	Chemical lifetimes		Example	Atmospheric Concentration s	Estimated Annual Global Emission [10 ¹² g C]
	Day	Night			
Isoprene	3 hrs	1.5 hrs	isoprene	ppt to several ppb	175 - 503
Monoterpenes	2-3 hrs 40-80 min 15-20 min <5 min	5-30 min 5-20 min <1 min <2 min	α-pinene, β-pinene, sabinene limonene, t-β-ocimene, myrcene terpinolene, α-phellandrene α-terpinene	ppt to several ppb	127-480
Sesquiterpenes	<4 min	<2 min	B-caryophyllene	not detectable due to high reactivity	
ORVOC	<1 day		2-methyl-2-buten-2-ol	1-3 ppb	
OVOC	>1 day		methanol,	2-30 ppb	



BIOGENIC VOLATILE ORGANIC COMPOUNDS

The need for research...

- Cost up to 10% of plant's assimilated carbon; expensive - once allocated to defense can't be reverted back and be used for other fitness-relevant processes
- Natural process, highly influenced by biotic and abiotic factors – hence, very little we can do to stop plant from production of BVOCs
- However, as ozone, nitrogen oxides and other GHGs are produced anthropogenically, plenty we can do to abate them
- Better understanding of plant's physiology is important to better understand plant's role as a major carbon sink



BIOGENIC VOLATILE ORGANIC COMPOUNDS

OP3-Danum-08 Project

Oxidant and particle photochemical processes above a Southeast Asian tropical rainforest

- Main campaign period: May – July 2008
- Consortium of scientists from ~30 institutions from Europe and North America
- To understand how emissions of reactive trace gases from a tropical rainforest mediate the production and processing of oxidant and particles in the troposphere, and to better understand the impact of these processes on local, regional and global scale atmospheric composition, chemistry, and climate



SUMMARY & CONCLUSION



• Local and international initiatives

- Environmental sustainability is always in Malaysia's top agenda; very much committed to protecting its biodiversity (Infapro, RIL, SBE, BBEC)
- Forest rehabilitation, carbon sequestration programme, CDM, biodiversity credits
- Joint Statement between 11 Tropical Rainforest Countries (F11)
- Coral Triangle Initiative (CTI)





SUMMARY & CONCLUSION



- **Proper coordination between federal and state governments is crucial**
- **Conservation of umbrella species (i.e. orangutan, rafflesia) leads to gazzement of more conservation/protected areas**
- **Palm oil sector has joined the bandwagon by acquiring biodiversity credits**
- **Plants emission of BVOCs *fills-in the* gap of carbon balance, eventually linked to climate change**



Thank you
Terima Kasih
Maraming Salamat po

