

Status of forest genetic resources conservation and management in Malaysia

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Introduction

This report provides an update of the status of forest genetic resources conservation and management (FGR C&M) in Malaysia (Lee and Krishnapillay 2004), which was presented during the Asia Pacific Forest Genetic Resources Programme (APFORGEN) Inception Workshop in Kuala Lumpur.

The following information will be updated: (1) organizations involved in FGR C&M; (2) new policies and legislations relevant to FGR C&M; (3) most recent figures on forest cover and protected areas; (4) recent national activities related to FGR C&M; and (5) challenges in FGR C&M in Malaysia.

Organizations involved in FGR C&M

Name of the organization	Address	Type	Molec. markers lab	Ex situ cons. facilities	In situ areas
Forest Research Institute Malaysia (FRIM)	Kepong, 52109 Kuala Lumpur, Malaysia	Research Institution	Yes	Yes	No
Forest Department of Peninsular Malaysia	Ibu Pejabat Perhutanan Semenanjung Malaysia, Jalan Sultan Salahuddin, 50660 Kuala Lumpur, Malaysia	National Department	No	Yes	Yes
Forest Department Sarawak	Wisma Sumber Alam, Jalan Stadium, Petra Jaya 93660 Kuching, Sarawak, Malaysia	State Department	No	Yes	Yes
Sabah Forest Department	P.O.Box 68, 90009 Sandakan Sabah, Malaysia	State Department	No	Yes	Yes
State Forestry Departments of Peninsular	Various, according to state	State Department	No	Yes	Yes
Malaysian Timber Industry Board	Level 13-17, Menara PGRM No.8, Jalan Pudu Ulu, Cheras, 50728 Kuala Lumpur	Statutory body	No	No	No
Malaysian Timber Council	18th Floor, Menara PGRM, 8 Jalan Pudu Ulu, 56100 Kuala Lumpur	Company limited	No	No	No
University Putra Malaysia	43400 Serdang, Selangor, Malaysia	University	Yes	Yes	No
Department of Wildlife and National Parks	Km 10, Jalan Cheras, 56100 Kuala Lumpur	National Department	No	Yes	Yes
Sarawak Biodiversity Centre	KM 20, Jalan Borneo Heights, Semengoh, Locked Bag No. 3032, 93990 Kuching, Sarawak Malaysia	Research centre	Yes	No	No
Malaysian Nature Society	JKR 641, Jalan Kelantan 50480 Kuala Lumpur, Malaysia	NGO	No	No	No
World Wide Fund for	49, Jalan SS23/15, Taman SEA, 47400 Petaling Jaya, selangor, Malaysia	NGO	No	No	No
Sahabat Alam Malaysia	No.27, Lorong Maktab, 10250 Penang,	NGO	No	No	No

	Malaysia				
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National policies and legislations relevant to FGR C&M

- Existing - Land Conservation Act 1960; National Land Code 1965; Protection of Wildlife Act 1972; National Parks Act 1980; Environmental Quality Act 1974 (amended 1985); National Forestry Policy 1978 (revised 1992); National Forestry Act 1984 (amended 1993); National Policy on Biological diversity 1998; Sarawak Biodiversity Ordinance 1997; and Sarawak Biodiversity (Access, Collection and Research) Regulations 1998.
- Biosafety Bill (ongoing).
Although the bill can be considered as biodiversity related law, only deal with biosafety issues related to genetically modified organisms.
- Access and Benefit Sharing Bill (ongoing).
Although the bill can be considered as biodiversity related law, only deal with access regulation to biodiversity and benefit sharing arrangements arising from the utilization of biological resources.
- National Forest Plan/Program (ongoing).
First draft of the plan/program is being circulated for comments among relevant agencies to incorporate principles of the National Policy on Biological Diversity and as part of the governments' commitment to the UN Intergovernmental Panel on Forests (IPF) process.

Forest cover

Data on forest cover in Malaysia differ according to different sources. Forestry Departments of Peninsular Malaysia, Sabah and Sarawak quoted 19.54 million ha or 59.5% of the total land area is covered with forest in 2002. The details of the distribution and extent of major forest types in Malaysia (million ha) in 2002 is given in table below (Anon 2004a).

Region	Land area	Mixed Dipterocarp Forest	Swamp Forest	Mangrove Forest	Plantation Forest	Total forested land	% of total forested land
Peninsular Malaysia	13.16	5.40	0.30	0.11	0.08	5.89	44.8
Sabah	7.37	3.81	0.12	0.34	0.14	4.41	59.8
Sarawak	12.30	7.92	1.12	0.15	0.05	9.24	75.1
Malaysia	32.83	17.13	1.54	0.60	0.27	19.54	59.5

Protected areas

Data on protected areas in Malaysia also differ according to different sources. Forestry Departments of Peninsular Malaysia, Sabah and Sarawak estimated 16.39 million ha or 49.9% of the total land area is totally protected in 2002. The details of the protected areas in Malaysia (million ha) in 2002 is given in table below (Anon 2004a).

Region	Land area	Protection Forest	Production Forest	National/ State Park	Wildlife and Bird Sanctuary	Total Protected Area	% of land area protected
Peninsular	13.16	1.90	2.80	0.58	0.31	5.36	40.7

Malaysia							
Sabah	7.37	0.59	3.00	0.25	0.16	3.87	52.5
Sarawak	12.30	1.00	5.16	0.70	0.30	7.16	58.2
Malaysia	32.83	3.49	10.96	1.53	0.77	16.39	49.9

National activities related to FGR C&M

Technical Committee on Plant Conservation Strategy for Malaysia

- Formed under Ministry of Natural Resources and Environment.
- Members: Forest Research Institute Malaysia (Chair), Forestry Development Division and Conservation and Environment Management Division of Ministry of Natural Resources and Environment, Forestry Department Peninsular Malaysia, Sabah Forestry Department, Forest Department Sarawak, Wildlife and National Parks Department and Universiti Kebangsaan Malaysia.
- The main objective is to conserve and manage sustainably plant resources so as to significantly reduce the current and continuing loss of plant diversity.
- Sixteen targets adopted from Global Strategy for Plant Conservation (Anon 2002) were discussed during the first meeting on 12-13 October 2004.
 - ⇒ A widely accessible working list of known plant species, as a step towards a complete national flora.
 - ⇒ Preliminary assessment of the conservation status of all known species.
 - ⇒ Development of models with protocol for plant conservation and sustainable use, based on research and practical experience.
 - ⇒ At least 10% of each of the national ecological habitats effectively conserved.
 - ⇒ Protection of 50% of the most important areas for plant diversity assured.
 - ⇒ At least 30% of production lands managed consistent with the conservation of plant diversity.
 - ⇒ 60% of the national's threatened species conserved *in situ*.
 - ⇒ 60% of threatened plant species in *ex situ* collections in the country, and 10% included in recovery and restoration programs.
 - ⇒ 70% of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated indigenous and local knowledge maintained.
 - ⇒ Management plans for major alien species that threaten plants, plant communities and associated habitats and ecosystems.
 - ⇒ No species of wild flora endangered by national and international trade.
 - ⇒ 30% of plant-based products derived from sustainably-managed sources.
 - ⇒ The decline of plant resources, and associated indigenous and local knowledge, innovations and practices that support sustainable livelihoods, local food security and health care, halted.
 - ⇒ The importance of plant diversity and the need for its conservation incorporated into communication, educational and public-awareness programmes.
 - ⇒ The number of trained people working with appropriate facilities in plant conservation increased to achieve the targets of this strategy.

⇒ Networks for plant conservation activities established or strengthened at the national level.

National Information Sharing Mechanism for the monitoring of Global Plan Action (GPA) for the conservation and sustainable utilization of Plant Genetic Resources for Food and Agriculture (PGRFA)

- Formed under the Ministry of Agriculture and Agro-based Industry.
- Malaysia Agriculture Research and Development Institute (MARDI) as the National Focal Points and various government agencies, government research institutes, universities and private companies as the national stakeholders.
- Objective is to improve country capacity in exchanging and analyzing PGRFA information for future planning.
- The mechanism is being prepared according to indicators and reporting format drafted by Commission on Genetic Resources for Food and Agriculture (Anon 2004b) and inline with GPA for the Conservation and Sustainable Utilization of PGRFA (Anon 1996).
- The first stakeholder meeting was held on 14-16 September 2004 to discuss the information on common tables (organizations, contact persons, projects and references).

Creation of Flora Malaysiana Centre (FMC)

Initiated by Forest Research Institute Malaysia in 2001, the objectives of the centre are:

- To develop the FMC as the reference centre for botanical research for Malaysia.
- To establish a centre of excellence for education and research in the field of botanical sciences, horticulture and landscape development.
- To promote the protection, conservation and sustainable utilization of indigenous flora and their habitats in Malaysia.
- To promote the development of Penang Botanic Garden as another botanical centre for Malaysia.
- To create public awareness on the role and importance of plants and forests in the maintenance of biological diversity in Malaysia. To provide recreation opportunities and education for the public in the Centre within an environment of a botanic garden in FRIM campus.

Fourteen projects and activities are currently been carried out with allocation of RM 4.59 million under the Eighth Malaysian Plan. These are:

- Domestication of herbaceous plants for horticultural introduction.
- Wild fruit plants of Peninsular Malaysia.
- Plant introduction program for Kepong Botanic Garden.
- Impacts of ornamental plant trade on some rare forest plants.
- Plant geography and conservation of Peninsular Malaysia flora.
- Conservation monitoring system for threatened plants.
- Web-site and interactive database of the flora of Peninsular Malaysia.
- Mapping and documentation of urban vegetation.
- Plant conservation Malaysia - occasional periodicals.

- Shared propagation facilities for projects.
- Shared computer and GIS facilities for projects.

Conservation biology of endangered dipterocarps project

- A project initiated in Forest Research Institute Malaysia since 2000 through various funding sources.
- The overall objective is to generate biological information of endangered dipterocarps towards conservation management.
- Multi-disciplinary research approach, which involves botanists, geneticists and ecologists.
- At the moment, focused on ten endangered dipterocarps in Peninsular Malaysia: *Shorea lumutensis*, *S. gratissima*, *S. inappendiculata*, *Hopea subalata*, *H. bilitonensis*, *H. pachycarpa*, *Dipterocarpus acutangulus*, *D. perakensis*, *Dryobalanops beccarii*, *Vatica yeechongii*

Fourth National Forest Inventory (NFI)

- The NFI is conducted by Forest Department of Peninsular Malaysia to quantitatively and qualitatively update the forest resources data of Peninsular Malaysia in an interval of 10 years.
- First NFI (1970-72), second NFI (1981-82) and third NFI (1991-1993) (Chin *et al.* 1997).
- The fourth NFI activities have been carried out since 2000 and at present in the final stage of report preparation.

Forest resources monitoring system

- A system that has been developed by Forest Department of Peninsular Malaysia since 1996 to monitor changes of forest resources in Malaysia.
- The system utilizes computer technology to store, analyze and present forest resource data in the form of tables, maps and graphics.
- The system is based on a three phased approach consisting of the following:
 - Phase 1: The use of satellite imagery, basically Landsat TM for the establishment of a fixed grid of monitoring points over the entire forested area. A 2.5 minute grid has been adopted for the identification of all types of natural forest and plantation.
 - Phase 2: Establishment of a Geographic Information System (GIS) to describe in detail, at any time, the past and present forest situation at these grid points. Apart from providing the information on total forested area, the system will also record changes in the forest cover, due to legal or illegal human activities.
 - Phase 3: Field sampling on a continuous basis, of all the forest types on a randomly selected number of grid points according too predetermined accuracy standards. This sampling will keep the stand and stock table data of the various types updated.

The Tree Flora of Sabah and Sarawak Project

- This project was officially launched on 18 November 1991.
- It is executed jointly by the Forest Research Institute Malaysia, the Sabah Forestry Department and the Sarawak Forestry Department with the collaboration of other research institutions and universities.
- The main objectives of the project are to document and update the taxonomic status of all tree-species (at least 5m in height and 10cm in diameter) native to Sabah and Sarawak and to publish 8 volumes (each containing 300-400 species) of a concise Tree Flora of Sabah and Sarawak within 10 years.
- Four volumes of the Tree Flora of Sabah and Sarawak have so far been published. The fifth volume will be published by end of 2004.

Challenges in FGR C&M

The Federal and State Governments relationship

Malaysian Constitution prescribes what laws may be made by Parliament (Federal list), what laws may be made by State Legislature (State list) and what laws can be made by either of the two (Concurrent list). For example, protection of birds and wild animals, and National Parks falls under the legislative authority of both the Federal and State Governments in accordance with the Concurrent List, but forest, land and agriculture falls under State List alone. In general, much of the legislation in the country is sector-based. Although the Federal Government provides guidance on management and development and can legislate in certain areas (such as national parks), the State Governments have jurisdiction over their forest and land resources. Most States have adopted the National Forestry Act 1984, but implementation is up to them. Furthermore, Sabah and Sarawak have a wider degree of autonomy and have their own forest and land laws.

Implementation of National Policy on Biological diversity

After the launch of this policy, it is not clear how its implementation has been carried out, even though the Eighth Malaysia Plan (2001-2005) has stated that the Biodiversity Action Plan will be implemented in various States. In general, while forest related policies have always been clear and well defined in forestry legislation and in development plans, it may be that the implementation of such policies has been deficient.

Economic development versus FGR conservation

Integrating FGR conservation into development plans will require intense efforts as the pressure for economic development and consumptive patterns are far greater than existing environmental awareness and concerns. It is a challenge to weigh economic development and the capacity of forests to provide ecological services (water resources, prevent floods and droughts, etc.).

Establishment of protected areas

At the moment, several important habitats were under-represented in the protected area system: remaining lowland and hill forests, coastal dipterocarps, mangroves, peat swamps and freshwater swamps, limestone and quartz hill vegetation, montane flora. It remains a challenge on how to setup a single standardized system common to Peninsular Malaysia, Sabah and Sarawak for the establishment of protected areas.

Threatened plant species and populations

Identification of threatened plant species and populations in Malaysia and to develop legislation for the protection of threatened forest plant species and populations.

Research findings and policy-maker communication

It remains a challenge on how to effectively communicate the research findings on FGR C&M to policy-maker and how to overcome the gap between conservation research and conservation management.

Indigenous and local communities

It poses a challenge also on how to include indigenous and local communities, who are the holders of traditional knowledge, who have managed FGR for generations and are directly dependent on the healthy state of biodiversity for their daily livelihood in the FGR C&M debate and policy development.

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