



Ministry of Natural Resources
and Environment, Malaysia

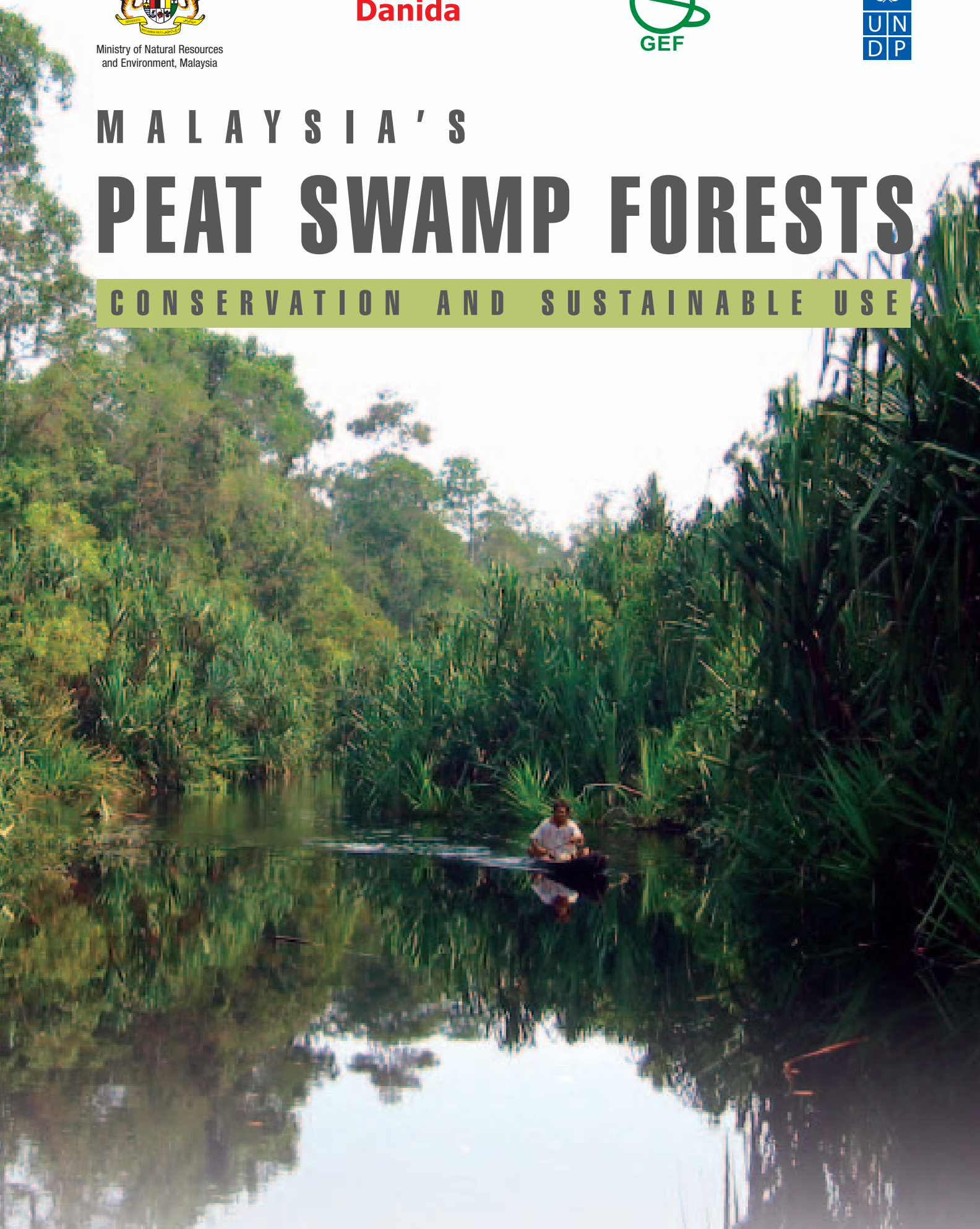
Danida



M A L A Y S I A ' S

PEAT SWAMP FORESTS

CONSERVATION AND SUSTAINABLE USE



MALAYSIA'S PEAT SWAMP FORESTS

CONSERVATION AND SUSTAINABLE USE



Ministry of Natural Resources
and Environment, Malaysia

Danida



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Foreword

Peat swamp forests are an important component of the world's wetlands – the dynamic link between land and water, a transition zone where the flow of water, the cycling of nutrients and the energy of the sun combine to produce a unique ecosystem of hydrology, soils and vegetation. Peat swamp forests provide a variety of benefits in the form of forestry and fisheries products, energy, flood mitigation, water supply and groundwater recharge.

Nearly 60 per cent of Malaysia, or about 19.5 million hectares, is under forest cover of one type or another. Peat swamp forests constitute a significant component of this cover with an estimated 1.54 million hectares still remaining. More than 70 per cent of these peat swamp forests are in Sarawak, less than 20 per cent in Peninsular Malaysia and the remainder in Sabah. Large areas of peat swamp forest in Malaysia have already been cleared and drained for agriculture, settlement and other human activities, but such changes completely alter the landscapes and eliminate many of the specialized flora and fauna associated with these wetlands.

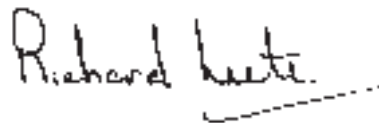
In 1999, the Government of Malaysia initiated a project to conserve its rapidly depleting peat swamp forests with support and funding from the United Nations Development Programme (UNDP/Global Environment Facility (GEF)) in collaboration with the Danish International Development Assistance (Danida), and the five-year project commenced in mid-2002. The project's primary objective is to develop and implement integrated management plans that will facilitate the conservation and sustainable use of these globally significant forests. The project focuses on three sites in South-East Pahang, the Klias Peninsula in Sabah, and Loagan Bunut in Sarawak.

This publication provides an assessment of progress in the various undertakings of the project at the three distinctive sites. Now in its fourth year, the project has already accumulated a great deal of information, established strong links with local communities, and developed processes and procedures for cooperation and coordination among the various public and private agencies involved. The information presented here provides some indication of the efforts being made to maintain these forest ecosystems while enabling sustainable use of products and services, and the measures being adopted to achieve these ends.

This is the first of a new series of periodic publications that will report on UNDP Malaysia's work in its energy and environment practice area. The large range of projects being undertaken in this area are designed to support Malaysia's efforts to achieve the Millennium Development Goal 7 (MDG7), of ensuring environmental sustainability. The series of publications will also be made available through UNDP's website, <http://undp.org.my>.

I would like to thank GEF for funding this project and the Ministry of Natural Resources and Environment Malaysia for implementing it with UNDP. I would also like to thank the other Institutional Participants and members of the Peat Swamp Project Team (page 33). Special thanks go to members of the Report Team (page 33) for their professionalism and good efforts in putting this publication together. I sincerely hope that it will be widely read and will increase awareness of the critical importance of good environmental management.

The project has highlighted a number of important issues and some significant lessons have been learnt. It is to be hoped that, as the project moves towards completion in 2007, these experiences and the outcomes in the form of community involvement and the production of integrated management plans will provide exemplars for further steps in the conservation and sustainable use of forests and wetlands throughout Malaysia.

A handwritten signature in black ink that reads "Richard Leete". The signature is written in a cursive style with a long horizontal stroke extending to the right.

Richard Leete Ph.D
Resident Representative
United Nations Development Programme
Malaysia, Singapore & Brunei Darussalam

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PEAT SWAMPS AND PEAT SWAMP FORESTS



What are Peat Swamp Forests?

Peat swamp forests are waterlogged forests growing on a layer of dead leaves and plant material up to 20 metres thick. They comprise an ancient and unique ecosystem characterized by waterlogging, with low nutrients and dissolved oxygen levels in acidic water regimes. Their continued survival depends on a naturally high water level that prevents the soil from drying out to expose combustible peat matter. This harsh waterlogged environment has led to the evolution of many species of flora uniquely adapted to these conditions.

Peat swamps are an important component of the world's wetlands – the dynamic link between land and water, a transition zone where the flow of water, the cycling of nutrients and the energy of the sun combine to produce a unique

ecosystem of hydrology, soils and vegetation. These swamps provide a variety of goods and services, both directly and indirectly, in the form of forestry and fisheries products, energy, flood mitigation, water supply and groundwater recharge.

Peat forms when plant material, usually in marshy areas, is inhibited from decaying fully by the acidic conditions and an absence of microbial activity. For example, peat formation can occur along the inland edge of mangroves where fine sediments and organic material become trapped in the mangrove roots. Peat is mostly soil with more than 65 per cent organic matter that is composed largely of vegetation including trees, grasses, mosses, fungi and various organic remains including those of insects and animals. Peat formation occurs when the rate of accumulation of organic material exceeds the rate of decomposition.

Water in Peat Swamps is Acidic

- pH is a measure of the acidity or alkalinity of water and relates to the concentration of hydrogen ions;
- a pH of 7.0 is neutral: below 7.0 is acidic, above 7.0 is alkaline; peat water is generally acidic with a pH of less than 4.5.

The build-up of layers of peat and degree of decomposition depend principally on the local composition of the peat and the degree of waterlogging. Peat formed in very wet conditions accumulates considerably faster and is less decomposed than peat accumulating in drier places. The peat acts as a natural sponge, retaining moisture at times of low rainfall but, because it is normally waterlogged already, with a very limited capacity to absorb additional heavy rainfall

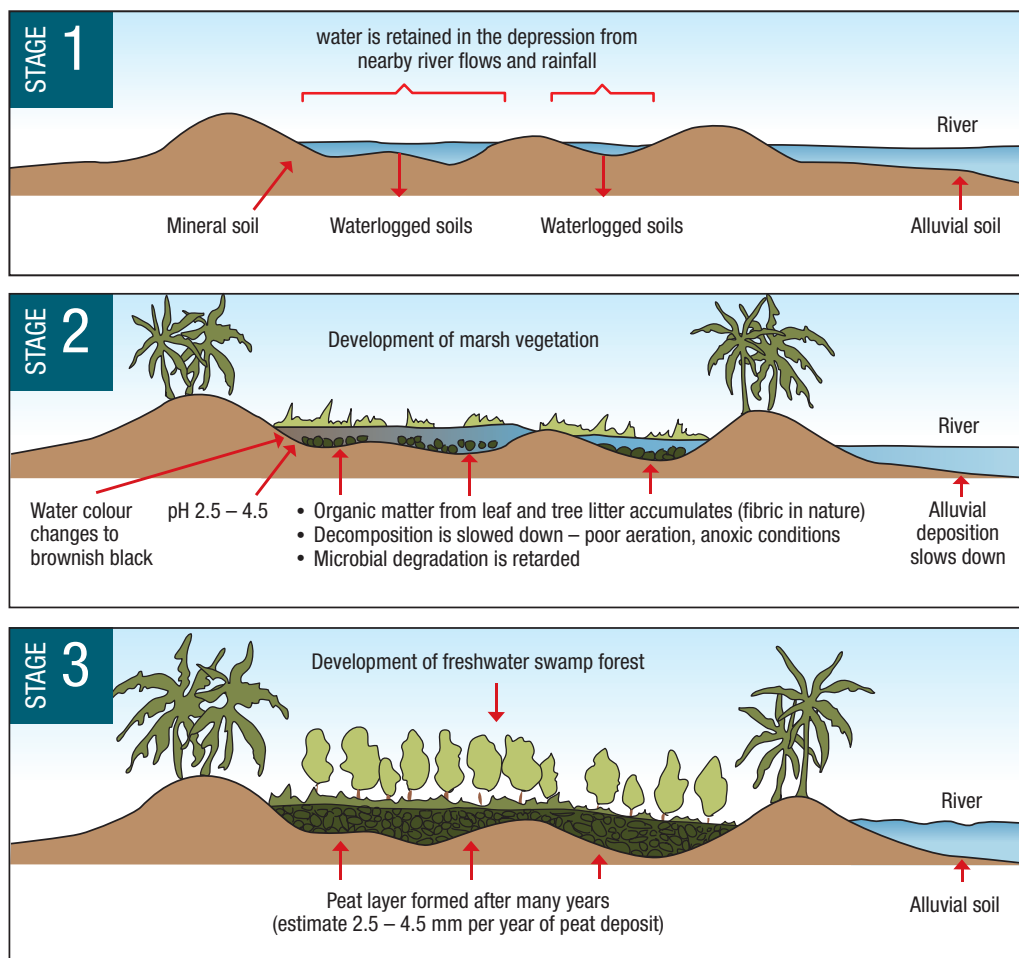
during periods such as a tropical monsoon.

Peat swamp forests develop on these sites where dead vegetation has become waterlogged and is accumulating as peat. Water in peat swamps is generally high in humic substances (humus and humic acids) that give a typically dark brown to black colour to the water. These conditions influence the types of vegetation that thrive in the covering forests and that, in turn, contribute to the character of the swamps.

Diversity of Peat Swamp Landscapes

Peat swamps are characterized by diverse features that relate to the –

- nature of the water supply, such as flooding by surface or groundwater, or solely from rainfall;
- type of landscape in which the peat swamp occurs, such as shallow depressions close to rivers;
- type of landscape that the swamp creates, such as accumulation of peat above groundwater level so that vegetation, often with prominent aerial roots, becomes wholly dependent on rainfall.





Peat Swamp Management

Sustainable use of wetlands aims to conserve the natural resources of a wetland while allowing exploitation that does not irreversibly destroy the wetland's functions or its potential to support people and wildlife. This balance is difficult to achieve for peat swamp forests that are located in populated areas where the effects of economic activity impinge on the forest even though they may be designated as permanent forest reserves. Wetlands are vulnerable to unsustainable land-use practices, over-exploitation and the direct or indirect invasion of incompatible land uses and practices in adjacent buffer zones. This risk cannot be effectively mitigated until an integrated management plan is put in place and implemented with the wholehearted support of all stakeholders — both public and private.

An ecosystem approach reorients the boundaries that traditionally have defined management of ecosystems.

An ecosystem approach emphasizes a systemic approach. Ecosystems function as integrated, holistic entities and need to be managed as such. This approach looks beyond official jurisdictions, recognizing ecosystems have no regard for national or state boundaries.

An ecosystem approach takes the wider and longer view.

Ecosystem processes may operate at the micro level but need to be viewed in the broader frame of the total landscape and over periods of decades, working across a variety of scales and time dimensions.

An ecosystem approach includes people.

Social and economic information about people is integrated with environmental information about the ecosystem. Whilst acknowledging ecosystem processes and biological thresholds, there is still an appropriate place for human modification of the ecosystem. Human needs can be explicitly linked to the biological capacity of ecosystems to fulfill those needs.

An ecosystem approach maintains the productive potential of ecosystems.

An ecosystem approach is not focused on conservation alone. Goods and services are the sustainable output of a healthy ecosystem. Management is deemed successful only if it preserves or increases the capacity of an ecosystem to produce the desired benefits in perpetuity.

An Ecosystem Approach is an Integrated Approach

Currently we tend to manage ecosystems for one dominant good or service, such as fish, timber or hydropower without fully realizing the trade-offs we are making. In doing so, we may be sacrificing goods or services more valuable than those we receive. Sometimes these goods and services, such as biodiversity or flood control, are not currently or highly valued in the market place. An ecosystem approach considers the entire range of goods and services and attempts to optimize the mix of benefits within a given ecosystem and across ecosystems. Its purpose is to make trade-offs efficient, transparent and sustainable.

Why Is Conservation of Peat Swamp Forests Important?

Peat swamp forests are unique habitats for fauna and flora, commonly with a high proportion of endemic species that give these areas worldwide significance not only for unusual species but as a gene bank with untapped and even undiscovered resources for medicinal and other important human uses. They play an important part in stabilizing the ecosystem, particularly in the control of drainage, microclimate, water purification and soil formation. Coastal peat swamps act as a buffer between marine and freshwater systems, preventing excessive saline intrusion into coastal land and groundwater.

Peat swamps often serve as a natural gene bank, preserving potentially useful varieties of plant species. At a global scale the peat swamp forests contribute to the storage of atmospheric carbon that is an agent of global warming, helping to slow down that process. Peat swamp forest

areas can also be very productive through the managed extraction of fish, timber and other forest products.

There is a widespread misapprehension that peat covered catchments can function as aquifers or giant sponges, absorbing and storing water during wet periods, preventing floods, and releasing water slowly during dry periods. However, since water tables are at or close to the level of the forest floor, and there is an already saturated upper peat layer, there is little further storage space available for additional water. The amount of water in peat depends on the level of the water table, which after prolonged dry periods naturally induces a low water table. Since lateral infiltration is facilitated by roots, peat will easily retain modest amounts of rainfall following dry spells. However, surplus water retained during the wet season is attributable to flat topography and poor drainage rather than any sponge-like function of the peat substrate.



Peat Swamp Water Levels, Storm Flow and Floods

- High water tables and waterlogged conditions within undisturbed peat swamp areas imply that further water-storage capacity is limited, even though peat soils have a high water-holding capacity;
- Data from the Peat Swamp Forest Project in Malaysia show that during wet periods, water storage capacity is very low and drainage response occurs within 1-2 hours after rainfall has started;
- Even after prolonged dry periods (more than 10-15 days), storage capacity is only 20-30mm of rain;
- the role of predominantly rain-fed peat lands as storm flood protecting environments is restricted to the capacity of individual catchments;
- In peat lands that receive water from surrounding areas, as in the Pekan Forest Reserve, Pahang, the peat deposit, due to its flatness, will act as a buffer and delay the discharge of water.

Peat Swamps as Reservoirs of Fresh Water

The sourcing of fresh water from peat swamps for potable uses raises several issues:

- **quality of the peat water:** peat and its drainage are very acidic, poor in nutrients, and saturated with organic matter, making it unsuitable for potable use without extensive treatment;
- **the low drainability of peat soil:** poor drainability of peat soils makes it very difficult to retrieve a significant flow of water from a peat swamp area especially if attempting to tap supplies from sub-surface sources;
- **the impact of water extraction on peat swamp sustainability:** extraction of significant quantities of water would have serious impacts on the natural hydrological system, causing a lowering of the groundwater and, over time, leading to peat decay and subsidence.



Human Intervention

Ill-advised and uninformed intervention in the ecology of the peat swamp forest quickly destabilizes the system and frequently has serious, harmful results. Drainage that lowers the groundwater table deprives plants of essential nutrients and exposes combustible material. Unregulated and unsustainable timber extraction contributes to loss of biodiversity and soil compaction, radically changing the habitat and the natural processes of regeneration.



Land conversion to intensive human activities, such as agriculture or industry, rapidly modifies the ecosystem, frequently in an irrecoverable fashion. For example, when peat swamp forests are drained for such purposes as the expansion of agriculture, the peat swamps tend to become highly susceptible to combustion and peat fires are a recurrent problem. In unusually dry conditions such as those experienced under the El Niño regime of 1997-98, thousands of fires raged in the peat swamps of Malaysia and Indonesia affecting an estimated area of 800,000 hectares.

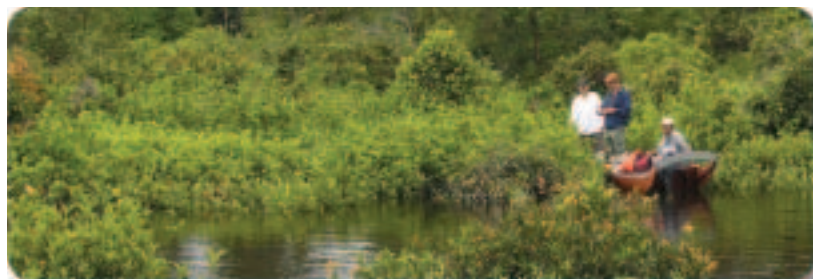
The impact of the El Niño weather

patterns on the monsoon means that the rain zone that is usually centred over the western margin of the Pacific, especially Indonesia and Malaysia, moves eastward into the central Pacific depriving these countries of their normal rainfall, and exposing and drying out the peat swamps, increasing their combustibility and the risk of fire. The prolonged presence of smoke haze can have a serious impact on human health, especially for those with respiratory difficulties, and the haze hazard affects urban as well as rural populations over large areas.

Fires in these peat lands are unique in that they create many times more smoke per hectare than any other forest types, and they are almost impossible to extinguish without restoring the naturally high water levels. Once started, fires in peat swamps are extraordinarily difficult to extinguish because the conflagration continues in the deep, inaccessible layers of peat.

Potential Benefits of Peat Swamp Forests

Whereas the diverse uses of peat swamp forests and their outstanding attributes are well known, the importance of their functions in the local and wider ecological system is often poorly appreciated.



The Potential Benefits Provided by Intact Peat Swamp Forests

General Value

Uses

Commodities that can be directly harvested and have a market value

Specific Benefit

Forestry
Agriculture
Recreation/tourism
Research/education
Water supply
Wildlife production
Fish production

Functions

Indirect uses that provide services that are difficult to value but without which there would be substantial 'replacement costs'

Flood mitigation
Prevention of saline water intrusion
Maintenance of base flows in rivers
Sediment removal
Nutrient removal
Toxicant removal
Groundwater recharge
Groundwater discharge

Attributes

Benefits that do not have any monetary value (apart from tourism), but which are treasured for their historic, cultural and biologically diverse qualities

Biological diversity
Cultural/spiritual value
Historic value
Aesthetic value
Wilderness value

PEAT SWAMPS AND PEAT SWAMP FORESTS

Flood Mitigation

Intact peat swamp forests can diminish peak flood flows mainly by reducing water velocity but also by providing a large area for storage of flood waters in terms of spatial area and, to a very limited degree dependent on how waterlogged the peat is already, through the water-holding capacity of the peat. (see Fig 2A & 2B)

Maintenance of Base Flows in Rivers

The water from floods held in peat swamps is released gradually over a long period. Intact peat swamps can contribute to maintaining the water level in rivers that run through them during dry periods.

Prevention of Saline Water Intrusion

Saline intrusion is related to base flows in rivers. By maintaining base flows in rivers, peat swamps can prevent the intrusion of saline water up rivers and maintain fresh groundwater in coastal areas. (see Fig 3)

Sediment Removal

When a peat swamp area is flooded, the reduction in water velocity associated with it spreading over a wide area, together with the retarding effects of vegetation, allows suspended sediments to settle. Water flowing back into rivers will then be largely sediment free. (see Fig 4)

Figure 2A

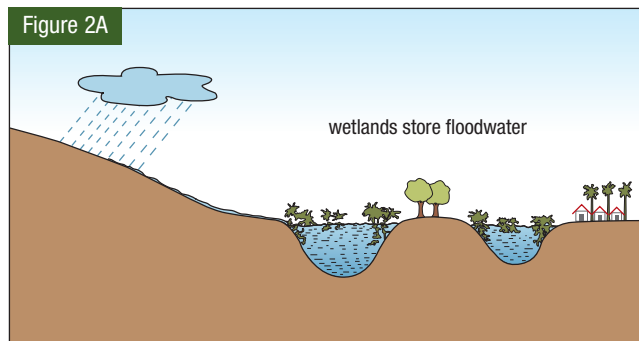


Figure 2B

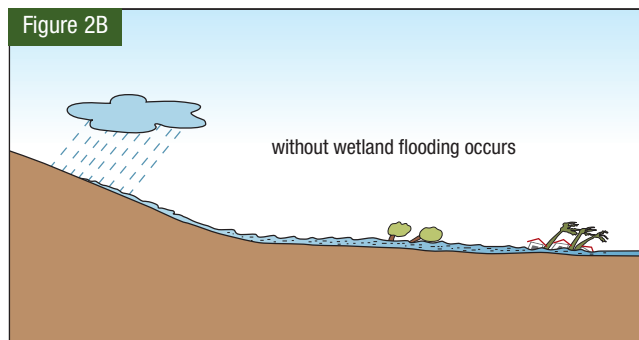


Figure 3

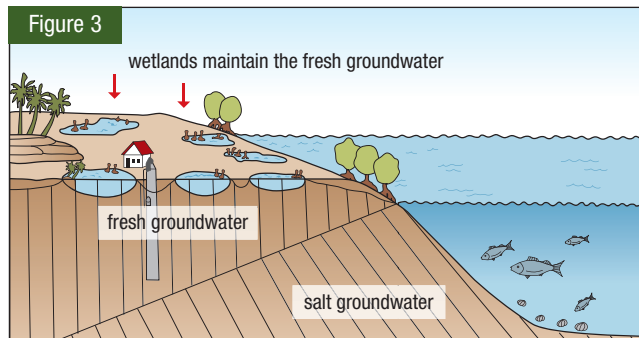
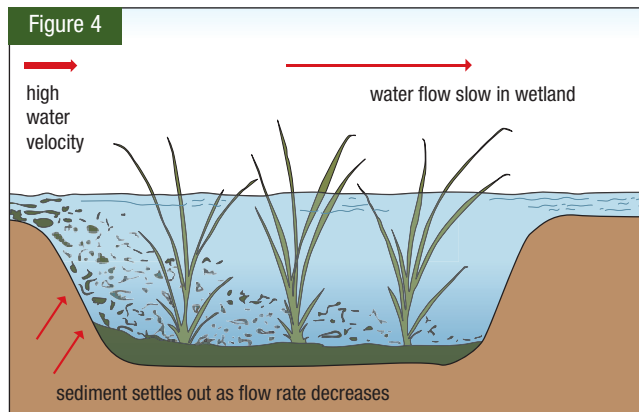
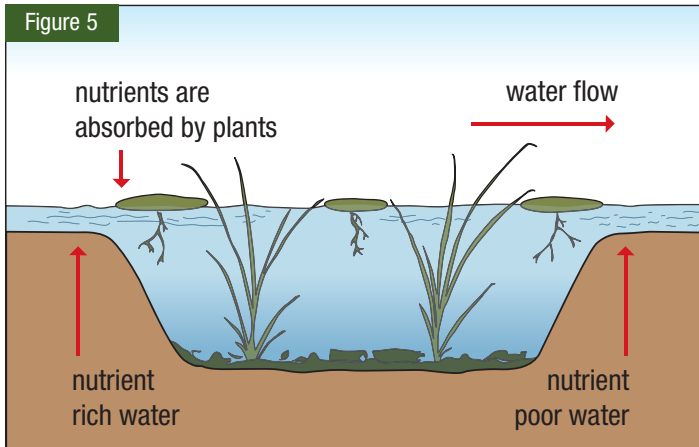


Figure 4



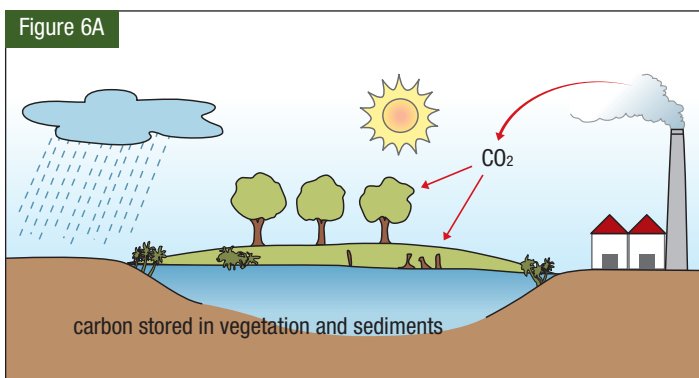


Nutrient Removal

Nutrients are often adsorbed onto the surfaces of suspended particles and deposited along with them. These nutrients are likely to be incorporated into biomass quite rapidly. (see Fig 5)

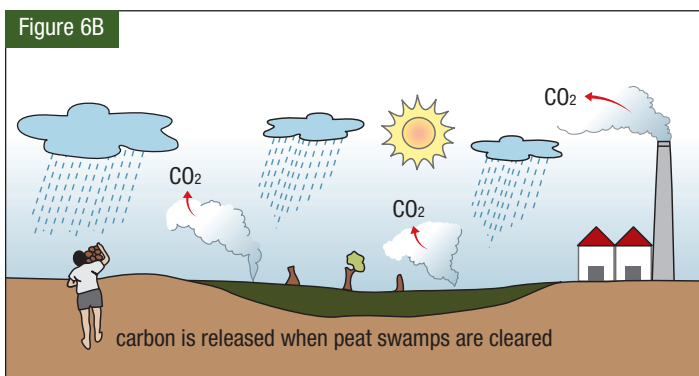
Toxicant Removal

Peat is very effective in binding metals. This largely accounts for the micronutrient deficiencies (such as copper) that are encountered when using peat soils for agriculture. Other metals (such as mercury and arsenic) are often bound in peat soils that are accumulated from waterborne and airborne sources over long periods. Some such metals are toxic in large quantities and peat acts as a reservoir for them.



Carbon Store and Carbon Sequestration

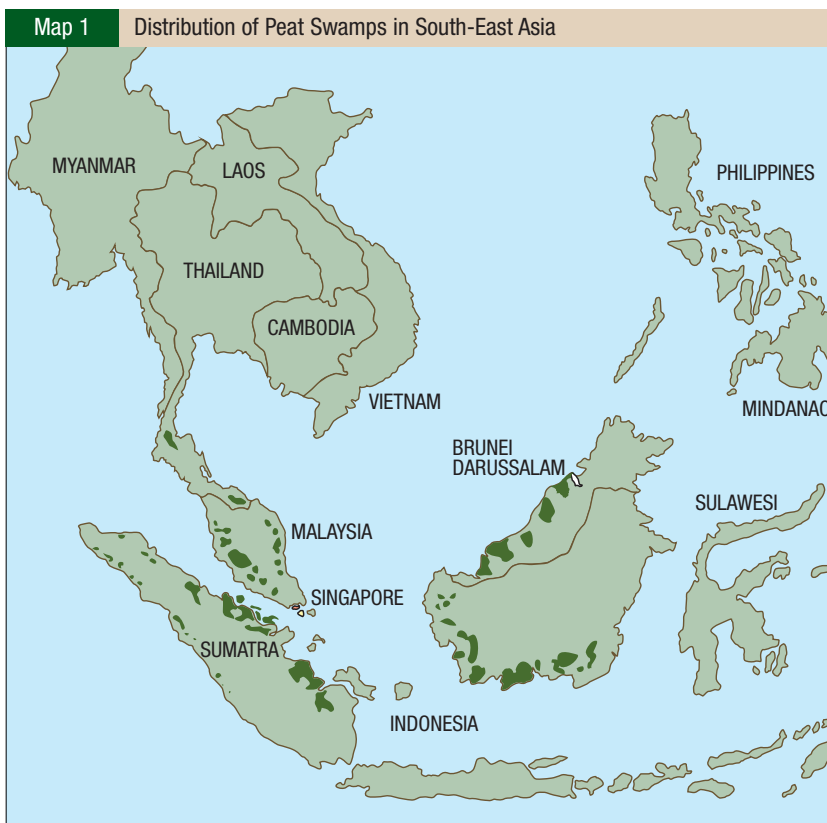
Recognition of this function has gained in importance in recent years due to the implication of raised CO₂ levels in contributing to global warming. Large quantities of carbon are stored in tropical peat lands. Estimates suggest that 5,800 tonnes of carbon per hectare can be stored in a 10-metre deep peat swamp compared to 300-500 tonnes per hectare for other types of tropical forest.



Tropical peat lands, besides acting as stores of carbon, actively accumulate carbon in the form of peat. Because decomposition is incomplete, carbon is locked up in organic form in complex substances formed by incomplete decomposition. Drainage of peat swamps destroys this useful function and may contribute to global warming through the release of CO₂ into the atmosphere. (see Fig 6A & 6B)

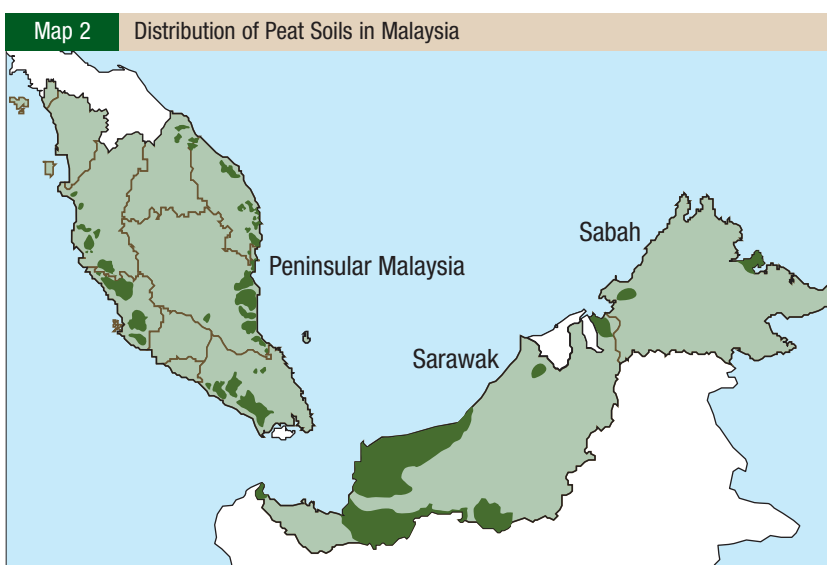
Where Are Peat Swamp Forests Found?

Forested peat swamps, which may be maintained either by direct rainfall or by groundwater, are common in tropical regions with high rainfall. Peat swamp occurs in a few areas in Africa and parts of central America, but more than 60 per cent of the world's tropical peat lands are to be found in South-East Asia. Most notable are the large peat swamp forests on the islands of Borneo (belonging to Indonesia, Malaysia and Brunei Darussalam) and Sumatra (Indonesia), but there are also significant areas in other parts of Indonesia, Malaysia, Vietnam, Thailand and the Philippines. Worldwide, peat swamp forests have been estimated to cover around 350,000 km², primarily in South-East Asia but also in such localities as the Everglades in Florida (United States). (See Map 1)



The Peat Swamp Forests of Malaysia

Peat swamp forest (See Map 2) is Malaysia's largest wetland type accounting for about 75 per cent of the country's total wetlands. An estimated 1.54 million hectares still remain, with more than 70 per cent in Sarawak, less than 20 per cent in Peninsular Malaysia and the remainder in Sabah. This remnant is restricted to small areas in northern and southern Selangor, Tasek Bera (in Pahang), a large forest complex in South-East Pahang, the Klias Peninsula in Sabah, and inland reaches of Sungai Baram including the periphery of Loagan Bunut in Sarawak.



Estimated Extent of Peat Swamp Cover in Malaysia

State	Total Area (hectares)
Selangor	76,000
Johor	13,000
Terengganu	13,000
Pahang	200,000
Sabah	120,000
Sarawak	1,120,000

The peat swamp forests of Peninsular Malaysia have undergone especially rapid reduction. In 1981, cover was estimated to be 0.67 million hectares which had been halved to 0.34 million hectares just a decade later as more forested land was cleared for agriculture, aquaculture, industries and residential schemes. Of the remaining estimated 300,000 hectares now left in the Peninsula, about 67 per cent has been protected within Permanent Forest Reserves with the remainder in stateland forests. Almost all of the peat swamp forests within permanent forest reserves are designated production forests and are therefore available for sustainable logging, while those within the stateland forests are generally available for conversion into other land uses as well.

Most cutover areas in stateland forest are seriously degraded, suffering from poor regeneration of peat swamp vegetation, and prone to repeated forest fires. The

specialized logging methods and extraction operations required for extraction of timber from peat swamp forests are not comprehensively practised and closer monitoring is required to detect and obviate destructive ecosystem impacts.

The tropical peat swamp forests of Malaysia and the fauna and flora that inhabit these habitats have global as well as national significance. Malaysia's peat swamp forests not only comprise unique ecosystems that are home to many endemic species but also provide sanctuary for viable populations of more than 60 animal species listed as globally threatened including the Orangutan, Proboscis Monkey, Sumatran Rhinoceros, Asian Elephant, Tiger, Civet Otter, Storm's Stork and Wrinkled Hornbill. These moist forests also serve as a natural gene bank of potentially useful plant species as well as providing highly valuable forest products such as timber and food. Many unknown species still remain to be discovered.

Conserving the forests is crucial not only to ensure sustainable use of the country's rich resources and protection of endangered species, but also to maintain environmental stability. Peat swamp forests act as a carbon sink, helping to slow global warming. It also plays a critical role in regulating water over vast areas, supporting agriculture by reducing the impact of floods, revitalizing the soil and providing a limited source of water during droughts.

INTERNATIONAL AGREEMENTS AND MALAYSIAN GOVERNMENT POLICY ON FORESTS AND WETLANDS



International Conventions

Malaysia is one of twelve countries in the world designated a **megadiversity region**. Its rich natural heritage is protected within national and marine parks, wildlife reserves and sanctuaries and permanent forest reserves established under legislation. Biodiversity issues transcend national boundaries, and to exercise a proactive and constructive role in international activities, Malaysia became a party to the Convention on Biological Diversity in 1992. A National Biodiversity Committee was set

up in 1994 to protect and manage Malaysia's biological resource, and to ensure the fair and equitable sharing of biological resources and technology. In order to help achieve these goals a National Action Plan was formulated.

The Government of Malaysia also ratified the Ramsar Convention on Wetlands of International Importance Especially as Wildfowl Habitat in 1994 at which time a further important wetland area, Tasek Bera in Pahang, was added to the list of protected areas specifically as a Ramsar site. At about the same time, during the Sixth Malaysia Plan period (1991-1995), the Sarawak State Government designated 1.03 million hectares of pristine forest as protected area, and established new national parks at Batang Ai, Loagan Bunut and Tanjung Datu. The Sabah State Government approved two new conservation areas, Semporna Islands Park and Kinabatangan Wildlife Sanctuary, to protect biodiversity, marine and freshwater resources.

The Convention on Biological Diversity (1992)

This convention was the first global agreement to recognize that conservation and sustainable use of biological diversity are the concern of everyone and an integral part of the development process in any country. Its objectives 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.

Ratified by Malaysia in 1992

The Ramsar Convention on Wetlands of International Importance Especially as Wildfowl Habitat (1971)

This is an intergovernmental treaty that provides the framework for national and international cooperation for the conservation and wise use of wetlands and their resources aiming to achieve sustainable development throughout the world.

Joined by Malaysia in 1994



Forest Reserves

Nearly 60 per cent of Malaysia, or about 19.5 million hectares, is under forest cover of one type or another. Of this total, 14.3 million hectares are gazetted as forest reserves managed under the Forestry Department of each state. The forest reserves are managed with the objective of maintaining the forestry ecosystem in perpetuity, while allowing for the use of forest products and services.

Evolution of Government Policy

In 1996, the Government of Malaysia launched its National Ecotourism Plan, followed by the introduction of the National Biodiversity Policy in 1998 for the specific purpose of protecting and conserving its diverse biological heritage. The capacity of several conservation agencies was strengthened and management plans were drawn up for a number of protected areas. In particular, a project to prepare a management plan for the first RAMSAR site was completed in 1999 and a number of other wetland sites identified for conservation and as a showcase of wetlands rehabilitation.

By the end of the twentieth century the natural resource management emphasis had shifted from concerns mainly over timber production to the simultaneous sustainable production of desirable outputs encompassing water, non-timber forest produce such as rattan, bamboo, medicinal plants, resins and dyes, as well as to the enhancement of the protective functions of forests. In addition to stabilizing the environment, forests were beginning to be recognized as a popular attraction for local and foreign tourists and as a valuable recreational option together with other natural resources such as waterfalls, rapids, unique rock formations, flora, fauna, wetlands and scenic panoramas.

Implementation of Policy at the State Level

During the period 1996-2000, 95 forest recreation areas were developed by state forest departments. Several bilateral projects with international agencies such as the Danish Corporation on Environment and Development (DANCED) were successfully completed. The projects included the preparation of Integrated Management Plans for Sustainable Use of Johor Mangrove Swamp Forests and for Sustainable Management of Peat Swamp Forests in Selangor and Pahang.

Heightened awareness of the national importance of efficient management of natural resources and the active promotion of sustainable development witnessed increased official activity during the period of the Eighth Malaysia Plan, 2001-2005. In 2001 and 2002, non-governmental organizations (NGOs) and community-based organizations (CBOs) were active in promoting sustainable development, and the environmental NGOs joined forces to form the Malaysian Environmental NGOs (MENGOs) forum to work on issues of common interest. These included dialogue with government agencies, and projects such as participation in the drafting of management plans for several other major conservation parks.

The Government of Malaysia also established the National Biodiversity-Biotechnology Council in 2001, to co-ordinate efforts at the federal and state levels to improve the management of biodiversity and the conservation of natural habitats and resources.

Continuing to recognize wetlands as unique and critical habitats, as well as their importance in stabilizing water flows and in mitigating floods, three additional localities, namely, Tanjung Piai, Pulau Kukup and Sungai Pulai (all in Johor) were designated RAMSAR sites in 2003. These additions, together with the original RAMSAR site at Tasek Bera, increased the total area of Malaysian wetlands recognized as being of international importance to 48,745 hectares.

Development of these plans and policies is on-going. The National Wetlands Policy is being formulated to protect and conserve wetlands generally, and to improve their management. Further expansion of gazetted wetlands is scheduled including that of the Sibuti Wetlands National Park in Sarawak which covers an area of 5,537 hectares. The Lambir-Niah-Sibuti cluster of protected areas in Sarawak is to be nominated as a UNESCO World Heritage Site.

Origins of the Peat Swamp Forest Study

It was during the earlier years of the Eighth Malaysia Plan that several forest management projects were initiated including this peat swamp forests study. Officially designated *The Conservation and Sustainable Use of Tropical Peat Swamp Forests and Associated Wetland Ecosystems Project in Malaysia*, this project is integral to the Government of Malaysia's active support for the Convention on Biological Diversity and the RAMSAR Convention. The project supports Malaysia's National Policy on Biological Diversity and the National Forestry Policy and is also a contribution to the Biodiversity Plan and the National Wetlands Policy, demonstrating their feasibility through the conservation of Peat Swamp Forests. The Project runs for a five-year term, 2002-2007.

THE PEAT SWAMP



FOREST PANORAMA



THE PEAT SWAMP FOREST PROJECT IN MALAYSIA

Collaboration with UNDP/GEF and Danida

In 1999, the Government of Malaysia initiated a project to conserve its rapidly depleting peat swamp forests with support and funding from the United Nations Development Programme (UNDP/Global Environment Facility (GEF)) in collaboration with the Danish International Development Assistance (Danida). The funding from these agencies amounted to US\$8,385,000 plus over US\$5 million in kind from the Government. The official agreement was signed early in 2001 and the project commenced in mid-2002. The project's primary objective is to develop and implement plans that will strongly contribute to the conservation and sustainable use of these globally significant forests. To achieve the project objectives a number of project outputs were formulated.

The Ministry of Natural Resources and Environment is the Executing Agency and the Forest Research Institute Malaysia is the

Implementing Agency for the project. Extending over five years to 2007, the project aims to promote the conservation and sustainable use of peat swamp forests in Malaysia by establishing multisectoral management plans that demonstrate how this can be achieved at three sites: the Loagan Bunut National Park (LBNP) in Sarawak, the Klias Peninsula in Sabah, and the South-East Pahang Peat Swamp (SEPPSF) in Pahang.

The project is being undertaken by the Government to safeguard the valuable resources of its peat swamp forests which have been reduced significantly by increasing pressure to expand production. The project is therefore developing and implementing individual management plans for these sites, introducing procedures that ensure the conservation of globally significant biodiversity, and contributing towards an improved understanding of peat swamp forests throughout Malaysia and the wider South-East Asian region.



Project Objectives

1. Develop and implement plans and encourage processes that ensure conservation and sustainable use of peat swamp forest;
2. Demonstrate a multisectoral approach in planning sustainable peat swamp forest management at three selected sites.

Project Outputs

- demonstrate planning for biodiversity conservation
 - output 1:** data collection and integrated database system;
 - output 2:** formulation of site management plans.
- demonstrate the implementation of biodiversity conservation and sustainable resource utilization strategies
 - output 3:** conservation and sustainable use demonstrated;
 - output 4:** inter-agency network present at state level.
- strengthen institutional and human technical capabilities and awareness
 - output 5:** increased awareness of stakeholders;
 - output 6:** strengthened institutions and personnel.

Project Approaches

When the project was designed in the late 1990s it was designated a GEF **Coastal, Marine and Freshwater Ecosystems** project in the biodiversity focal area. Subsequently a more appropriate category was introduced by GEF entitled Integrated Ecosystem Management. This would have been more suitable because these peat swamp forest habitats are much more strongly affected by activities in surrounding areas than other lowland tropical ecosystems. Equally important, the areas in Malaysia designated Forest Reserves or protected areas do not incorporate entire peat domes or systems but exclude sectors cleared of forest and converted to agriculture while often including other associated wetland ecosystems.

Working closely with various government agencies, local communities and non-governmental organizations, the project aims to develop and implement –

- efficient monitoring, data collection and information management systems for improved decision making and management planning that take account of the significance of the forests to local communities;
- strategies and management plans for –
 - threatened species protection
 - fire prevention
 - ecotourism
 - regulation of hunting and encroachment;
- a practical model of how globally significant biodiversity can be efficiently conserved and peat swamp forest resources sustainably utilized;

- the promotion of intersectoral coordination among relevant government agencies on order to encourage the efficient and sustainable use of peat swamp forest resources;
- enhanced awareness of national and global values generated by peat swamp forests and their ecosystems;
- institutional and human technical capacities to conserve and sustainably manage biodiversity in peat swamp forests and associated wetland ecosystems beyond the five-year project period.

Anticipated Outcomes

The results expected to be achieved by the project include –

- the institution of data collection and monitoring programmes;
- the implementation of site management plans that have been prepared;
- the successful demonstration of biodiversity conservation and sustainable resource utilization systems at the three project sites;
- the establishment of systems and processes for the planning of biodiversity conservation and sustainable resource utilization in peat swamp forests;
- strengthened institutional and human technical capabilities and capacities, and a heightened awareness of peat swamp forest biodiversity in Malaysia;
- enhanced inter-agency networks.



Primary Activities

The project sets out to undertake a range of activities and interventions to –

- conduct flora and fauna assessments;
- set up an integrated database for an information monitoring system;
- establish biodiversity monitoring programmes;
- facilitate forest land-use planning processes;
- establish planning procedures that integrate the social and biophysical elements;
- refine the core and buffer zones for biodiversity conservation;
- implement zonation and formulate appropriate conservation and sustainable use strategies;
- develop strategies and site-specific management plans;
- implement and demonstrate conservation measures at the three project sites;
- provide training programmes for forest land-use managers;
- launch campaigns to promote awareness among local communities, decision makers, managers and the public of the importance of conservation and

sustainable use of peat swamp forests;

- promote the participation of stakeholders, particularly local communities, in project implementation, and encourage public inputs into the decision-making process concerning the livelihood of local residents;
- establish local and regional networks with appropriate institutions and other similar initiatives to promote conservation and sharing of information, knowledge and experience;
- conduct training to strengthen local institutional and human capacities to ensure the sustainability of the project.

Challenges

In the context of the conservation and sustainable use project the major challenges to peat swamp forest conservation efforts derive largely from unregulated human intervention.

Often these threats occur concurrently as an area is drained to facilitate timber extraction and land conversion. Draining leads to lowering of groundwater levels and irreversible drying out of the peat. In combination with the large amounts of combustible material left by logging operations and the damage caused by the opening up of the canopy, these degraded peat areas become very susceptible to fire and, once burnt, experience permanent loss of their biologically diverse peat swamp vegetation. Urgent measures are required to prevent the total loss of these habitats.

Major Threats and Challenges

- Land conversion to industrial and agricultural uses;
- Hydrological problems resulting from irreversible lowering of groundwater tables causing the loss of essential nutrients required for plants;
- Unsustainable timber extraction contributing to the loss of biodiversity, and soil compaction leading to severe damage of the peat swamp forest habitat;
- Unregulated hunting contributing to the loss of animal species;
- Forest fires resulting from current land-use practices.



THE PEAT SWAMP FOREST PROJECT SITES



The approach taken by the project by UNDP/GEF has been to develop plans promoting multisectoral, integrated peat swamp forest management at a number of demonstration sites. Three peat swamp forest sites have been chosen in those Malaysian states with the largest remaining areas of this habitat type in the country. They are: the Loagan Bunut National Park in Sarawak, the Klias Peninsula in Sabah, and the South-East Pahang Peat Swamp Forest in Pahang (See Map 3).

Loagan Bunut National Park, Sarawak, East Malaysia

Loagan Bunut National Park, gazetted in 1990, extends over an area of 10,736 hectares of which 650 hectares comprise the large lake that gives the park its name (See Map 4). The lake is fed by the Tinjar and Baram Rivers but water flows fluctuate

during the year and when the flow from these rivers drops sufficiently the flow in the Bunut River is reversed and the lake begins to drain. Commonly during a prolonged drought the lake dries up completely leaving a mass of hard sun-baked mud.

The Core and Buffer Zones

In addition to a small number of plant communities unique to Bornean peat swamp forests, the park supports the only freshwater floodplain in Sarawak, an ox-bow lake, freshwater swamp forest, dryland forest, rivers and riverine forest.

Population Access

There are a few villages within and surrounding the park but no permanent human populations or settlements exist within the core zone, and only a small population, including two longhouses of poor Iban migrants on the fringe of the park, lives in the buffer zone. They all depend on

Core and Buffer Zones

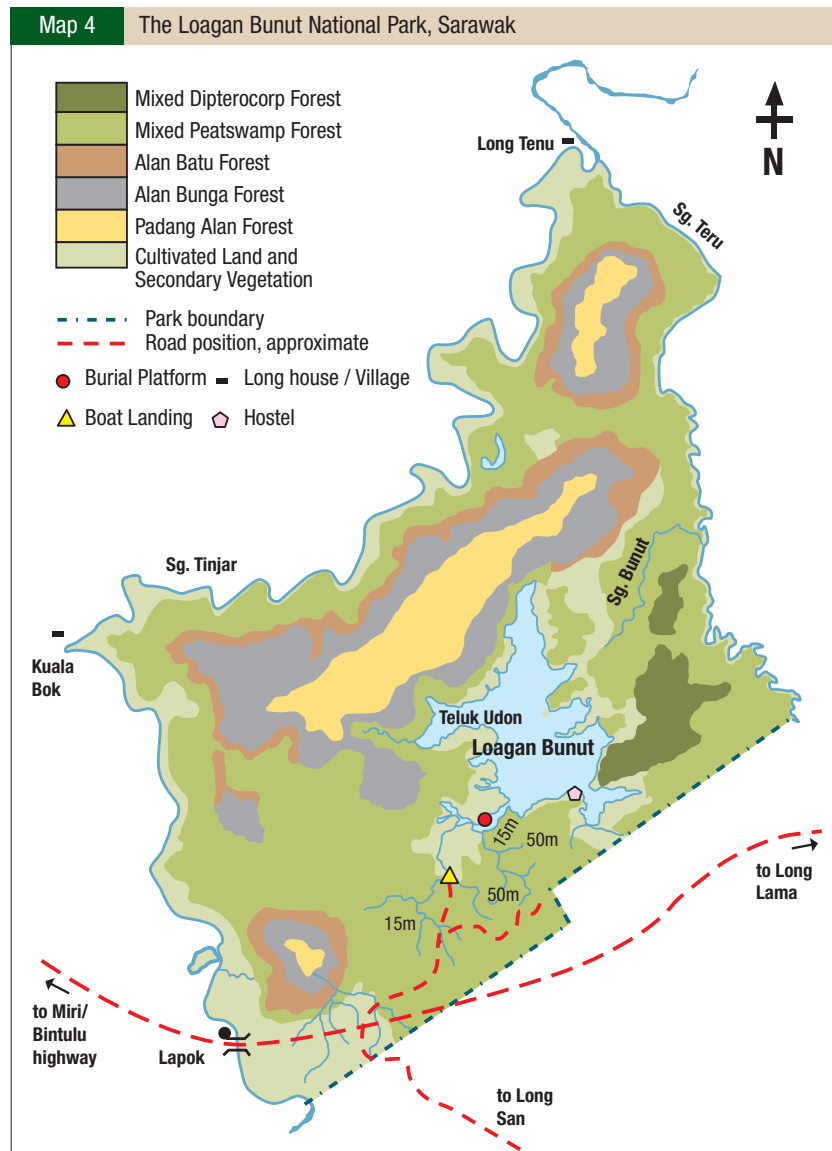
Loagan Bunut National Park protects a complex mosaic of wetland habitats. Peat swamp forest covers about 7,000 hectares which, together with the large lake, Loagan Bunut, comprises the **core zone** for the site. The remainder of the park constitutes the broader **buffer zone**. The northern portion of the park comprises mainly swamp, and it is here that the Kerapah peat swamp forest is located. The central part of the park is characterized by alan (seringawan) forest over peat swamp and the southern sector by lowland mixed dipterocarp forest.

catching fish, gathering forest produce and growing crops within the park. Oil palm plantations at varying stages of growth have replaced the forest that once surrounded the park especially on the east and southeastern perimeters. Towards the southwest corner of the park is a log pond covering about 10 hectares that has restricted uses associated with it, and there is a petrol station adjacent to the pond.

Under the National Parks Ordinance, the Berawan residents of Rumah Kajan Sigeh in Long Teru were the only local people accorded the right to fish, hunt and gather forest products in the park when it was established in 1990. Being indigenous to the area they are also allowed to continue farming on the land to which they have customary rights. However, increasing population in surrounding villages and pressure on the land together with an absence of enforcement have resulted in expansion of farming in the park and encroachment into additional high forest areas. Illegal timber extraction also still occurs from time to time.

Challenges

Oil palm plantations at different stages of growth have replaced the cutover forest surrounding the park. Two private resort operators are located within the lake area and they feature fishing as one of the attractions in their advertising for the tourist market. However, several native fish species are at risk from competition with introduced species (cultivated in fish ponds) released into waterways. Lake reptiles have also proved to be at risk from drowning in fish nets and the over-fishing of food



resources. In addition to violating the exclusive fishing rights of the Berawans, the private resorts discharge untreated waste into the lake. Land development activities contribute to accelerated deposition of sediment in the lake, and agrochemicals such as fertilizers, herbicides and pesticides and other organic pollutants pose a growing threat.

THE PEAT SWAMP FOREST PROJECT SITES



Klias Peninsula, Sabah, East Malaysia

In the past, there were over 100,000 hectares of peat swamp in Sabah and almost two-thirds of it was concentrated on the Klias Peninsula (See Map 5), but a large proportion has been degraded by repeated fires. The neighbouring Binsuluk Forest Reserve in particular has been severely ravaged by fire, leaving only the Klias Forest Reserve relatively intact. Currently it is estimated that less than 40,000 hectares of peat swamp forest remain as a result of habitat loss through fires and land conversion.

The Klias peat deposit is dome shaped, one of the few accessible examples in the whole of South-East Asia. This means that the central part of the peat deposit is elevated compared to the edges of the swamp which gives it distinctive hydrological characteristics. The entire Klias peat

swamp deposit is estimated to have been at least 7,400 hectares, much of it now lost. Just 3,630 hectares, some of it also recently affected by fire, is protected within the Klias Forest Reserve but this forms an integral part of a much larger natural landscape. This comprises 130,000 hectares of flat coastal plains that support extensive wetland environments. The mix of vegetative types is a complex network of peat forests, mangroves, nipah swamps, freshwater swamp forests, open marshes, kerangas (tropical heath forest) and dryland forests.

The Core and Buffer Zones

The natural vegetation of the Peninsula comprises several diverse wetland habitats ranging from dense stands of mangroves lining the coast, open marshes and nipah swamp, to unique mixed peat swamp forests further upstream. The outstanding examples of peat swamp

Core and Buffer Zones

The 3,630 hectares of the Klias Forest Reserve were gazetted for protection purposes in 1984 at which time all logging of the area ceased. The reserve, together with the adjoining Bukau-Api Api area (2,500 hectares) to the south, constitutes the **core zone** of the project site. No human populations exist within the Klias Forest Reserve but limited human populations are to be found within the Bukau-Api Api area and the broader **buffer zone**.

forest are unique in the state and possibly in the whole of Borneo.

Because of its domed shape, rainfall is the only source of water input to the Klias peat swamp forest. However, rainfall is irregular from year to year and from locality to locality. Water is lost via the processes of evapotranspiration from vegetation and lateral groundwater movement. The water table within the peat exhibits the same dome shape as the peat deposits themselves and this prevents outside groundwater from entering the swamp. Originally the peat swamp forests extended right across the peat dome deposits but today the forests are largely concentrated in the more confined area of the Klias Forest Reserve.

Although no commercial logging has taken place within the Klias peat swamp boundaries since its designation as a forest reserve, selective logging occurred during the 1960s and the forest is therefore most appropriately regarded as still in a stage of recovery. Nevertheless, the Klias Forest Reserve maintains an unusual assemblage of plants and animals compared with other freshwater swamps in Malaysia, due to the depth of the peat and the inaccessibility of the mineral soil. Nutrients available for plant growth are available only from internal recycling and inputs from rainfall. This scarcity of nutrients, the acidity of the environment and the waterlogged conditions require adaptation by some flora and most fauna existing in this ecosystem. In addition, the peat dome is drained from several localities by black water streams that support specialized fauna and flora.

Map 5 The Klias Peninsula, Sabah



Population Access

Renewed economic interest and agricultural development in the Klias Peninsula is threatening further habitat degradation, especially in the Bukau-Api Api area where proximity of villages and the partial reliance of the local communities on forested areas are exerting pressure. Areas in the north of the Klias Forest Reserve have not been spared the occurrence of fire and extensive conversion to agriculture, and further plans for alienation of areas within the forest reserve have been proposed. Forest conversion activities within the fragmented alienated lands abutting the northern fringes of the Klias Forest Reserve have been proceeding rapidly in recent years as they are cleared for agricultural use, and an extensive network of drainage canals has been dug for horticultural purposes.

Challenges

The peat swamps of the Klias Peninsula are fragile environments. Changes in the underlying hydrology can initiate the process of peat decay. When peat has been exposed, or where the water table has been significantly reduced due to man-made canals, the risk of peat forest fires is high. This risk is especially serious during periods of drought which may occur almost every year and is particularly severe during El Niño events. The smoke and dust from peat fires not only poses a severe health hazard to the local communities but usually develops into more widespread haze with enormous potential for economic losses. Haze episodes in the last decade have demonstrated that citizens suffer illnesses from air pollution and that tourism arrivals plummet, with impacts on the overall economy.

The larger coastal landscape, of which the Klias Peninsula Peat Swamp Forest is just a small part, is the main attraction for tourism in Sabah and may be regarded as the key component behind the economic development of the state's tourism sector. Sandy coastlines and mangrove fringes provide aesthetic, recreational and ecotourism opportunities and the Peninsula reportedly supports a breeding population of the proboscis monkey and many other small mammals and birds. Reported cases of poaching and fires are evidence of negative forces at work. Actively protecting and maintaining the natural ecological processes and managing the physical conditions that support the lifecycle of species occurring in this region are therefore of fundamental importance.

South-East Pahang Peat Swamp Forest, Peninsular Malaysia

The South-East Pahang Peat Swamp Forest (SEPPSF) is believed to be mainland Asia's largest and least disturbed peat swamp forest remaining in a single virtually contiguous complex. The SEPPSF lies within the administrative boundaries of the Pekan District and forms a broad band stretching down the eastern littoral of the Peninsula for about 70 kilometres. It is discontinuous, broken into three major blocks, bordered and dissected by major rivers including the Sungai Pahang, Sungai Bebar and Sungai Merchong. The strong hydrological links of the major river basins exert a dominating influence on the SEPPSF's hydrology which is therefore best regarded as a single ecological unit.

SEPPSF comprises about 200,000 hectares or about 60 per cent of the surviving peat swamp cover in Peninsular Malaysia. Over 40 per cent of this area (about 87,000 hectares) is located within four designated Permanent Reserve Forests: Pekan, Nenas, Kedondong and Resak and comprises the project study area. Stateland areas outside the reserve forests of the SEPPSF have either already been or are in the process of being cleared for agricultural land use. Timber extraction from within the forest reserves has started only recently with about 4,500 hectares being selectively logged in the northern part of the Pekan Forest Reserve (PFR).



Major Threats to the Klias Peninsula Peat Swamp Forest

The two main threats to the ecology of the Klias Peninsula Peat Swamp Forest may be summarized as degradation of the habitats and loss of ecological integrity.

- Habitat degradation is resulting from extensive and systematic drainage of neighbouring land that alters the composition of the biota and gives rise to a major fire risk that is further exacerbated by climatic events and land conversion.
- Loss of ecological integrity is directly attributable to human activities inside the protected areas and mainly involves the hunting of threatened species.

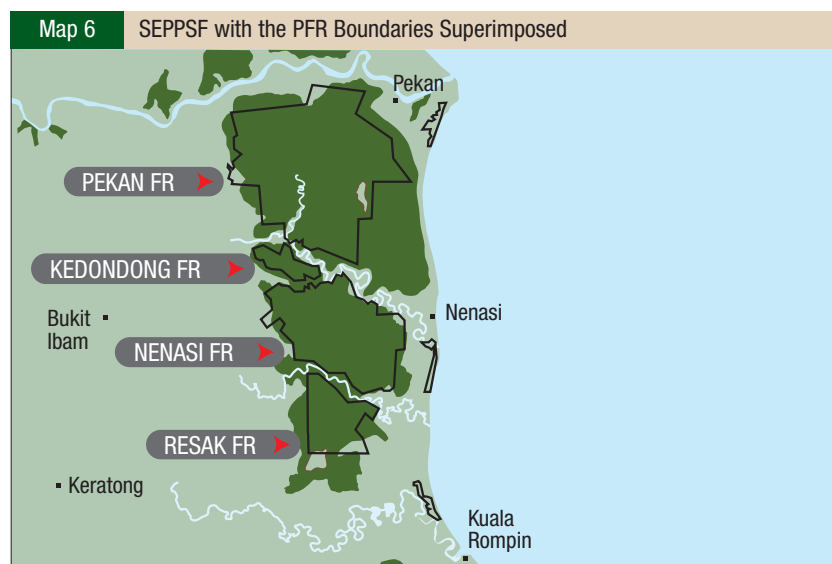
The Core and Buffer Zones

This site is being managed with a view to demonstrating methods for ensuring sustainable uses of peat swamp forest biodiversity, including logging and non-timber forest products, within a forest reserve management system. Designated areas with high conservation value are being established in the core zones, although the entire forest reserve is being managed as a single, strict biodiversity protection unit.

Species that are restricted to peat swamp and specialist species have all been recorded on the site together with species that are endemic to Pahang State and the Malay Peninsula. Its importance nationally has been recognized by the Malaysian Government, under the draft National Physical Plan developed by the Department of Town and Country Planning Malaysia, where the SEPPSF has been identified as one of the most critical **Environmentally Sensitive Areas** in Peninsular Malaysia. The SEPPSF has also been listed as an Important Bird Area for Malaysia through a Birdlife International initiative. This distinctive set of features was the basis for the complex's selection for the five-year project. (See Map 6)

Ecosystem Diversity

The SEPPSF complex has been the subject of global conservation interest as it contains an outstanding example of one of the world's most threatened wetland habitats. Observed in context, the SEPPSF is ecologically diverse and includes not just peat swamp forest but the full spectrum of habitats from shallow coastal waters to the mosaic of wetland and dryland habitats



inland. These include forest types that belong to the climatic climax formations (e.g., lowland dipterocarp forest), edaphic climax formations (e.g., mangroves, peat swamp forest, beach forest, freshwater swamp forest, riparian fringes) and unstable forest formations (padang vegetation). The variety of habitats provides a wide range of benefits that support different ecological niches. For example, the riverine strip performs several useful functions; it provides –

- important food input to the river ecosystem, especially where the canopy overgrows the river channel;
- leaves and woody material that are the driving force for the detritus-based food web which predominates in most forest streams and rivers;
- insects and fruits that fall from the trees as a direct food source for invertebrates and fish;
- an intact riverine strip that also filters out sediments and nutrients flowing into the river channel.

Core and Buffer Zones

The project's **core zone** comprises two core areas: the core area of Pekan Forest Reserve and the core area of Nenasi Forest Reserve. The core area of Pekan Forest Reserve, as the largest and possibly least threatened of the forest reserves, offers the most suitable location for strict conservation measures that, through a Global Environment Facility (GEF) intervention, will guarantee conservation of globally significant peat swamp forest diversity. The **buffer zone** includes all four forest reserves and adjacent land along the Rivers Bebar and Merchong.

THE PEAT SWAMP FOREST PROJECT SITES

Peat swamp habitats represent an extreme habitat for native biota and it is hardly surprising that numerous species are confined to their peat swamp habitats or are found only in local islands in peat swamp complexes. Other species characteristic of the extreme lowlands may also be present and are of considerable conservation interest due to their diminishing lowland habitats elsewhere within Peninsular Malaysia.

Population Access

The Jakuns are the main indigenous people living along the waterways and surrounding forests of the SEPPSF. They are a Proto-Malay tribe concentrated largely in South Pahang and North Johor speaking a dialect that branches from the same Austronesian family as Malay. Contact with other groups, historical factors and geographical location have resulted in modifications to their dialects and social organization which is generally informal and loose knit. The majority of Jakuns practise animism.

Shifting cultivators by tradition, many of them discarded their nomadic lifestyles when they were relocated to government settlements. The Jakuns were hunters and gatherers obtaining the bulk of their food requirements from hunting, fishing and trapping of land and aquatic animals as well as collecting forest produce such as rattan and medicinal plants. These days, many of these activities are still pursued but less intensively.

Although their lifestyle has now been substantially modified, the Jakuns are a true wetland people who use the natural resources of the peat swamp forests and



SEPPSF Ecological Habitats and their Associated Vegetation

Inland Areas – Wetland

Peat swamp forest
Freshwater swamp forest
Herbaceous swamp
River channels
Man-made channels
Freshwater riverine vegetation
Still open water
Macrophyte beds
Padang / secondary forest

Inland Areas – Dryland

Heath forest
Dipterocarp forest
Beach forest

Marine Coastal Areas

Mangroves
Sand beaches / beach strand
Mudflats
Lagoonal open water
Coastal open water
Brackish riverine vegetation

Features

dominant ecosystem
along riverbanks
prolonged inundation
tidal black water drainage
narrow canals; very low pH
along riverbanks
occur only by intervention
spawning, feeding nurseries
grassland / early regeneration

on old, leached sand ridges
on sandstone outcrops
on residual sand ridges

on depositions of mud
beach stabilizing vegetation
feeding areas near mangroves
sheltered, invertebrates
commercial marine fisheries
degree of salinity a determinant

other riverine areas for household purposes, house construction, subsistence and dietary needs. Non-timber forest products for traditional use include a wide range of animals, fish, insects, plants and tree products that are utilized for food, raw materials and medicine. Fish are an important source of dietary protein for this Orang Asli community living on the fringes of the peat swamp forest and its associated waterways. Most household members, including elders, women and children, still actively engage in fishing.

This close interdependence of the Jakuns and the SEPPSE and its associated wetlands is a crucial factor for their survival. Affordable and readily available alternatives are seldom available to these indigenous people. Wetland products provide an income supplement during difficult times and sometimes make the difference between survival and failure for these poor rural populations. Despite the substantial change in life style for many families, the wetlands still hold important cultural and religious significance, often with large areas designated as spiritual or ancestral forests.

Challenges

Land conversion leading to forest fragmentation.

Major concerns relate to the impact of changing land use in areas adjacent to the forest reserves. There is pressure to open or convert forest reserves and stateland on the periphery of the reserves either for logging or for agriculture. Agricultural schemes such as planting of oil palm, result in total loss of the forest cover, reduction in peat soil and extensive drainage of peat water. This affects the hydrology of the adjacent reserves and threatens the integrity of SEPPSF and its associated waterways especially if there is inadequate environmental management of the schemes as evidenced in intensive use and runoff of fertilizers and agrochemicals, severe soil erosion and release of soil leachates. But such activities are perceived as sources of economic benefit through the timber trade, land conversion premiums, assessment and quit rents.

Unsustainable logging. Valuable commercial timber species occur in the SEPPSF forest reserves as well as in the

Species Diversity in the SEPPSF

- About half the tree species known to be endemic to Peninsular Malaysia;
- Fauna that include 'endangered', 'near threatened' and 'vulnerable' mammals, birds, reptiles and fish;
- Species that are peat swamp restricted (stenotopic) having adapted to the conditions or that are unable to survive against competitors in other habitats;
- Birds that are dependent on lowland rain forest that has virtually disappeared in other habitats;
- Species for which the SEPPSF provides preferred breeding, spawning and roosting areas.

Changing Lifestyles of the Indigenous Population

Slash and burn are no longer a common practice within the Jakun community. Instead they manage their own small scale rubber or oil palm plantations as well as other subsistence SEPPSE factories. They still gather forest products such as rattan, bamboo, wood, resin and medicinal plants, and their familiarity with this distinctive environment makes them popular as guides for ecotourists.

THE PEAT SWAMP FOREST PROJECT SITES

stateland forests surrounding them. The timber trade contributes revenue to the state and provides opportunities for economic development. Although there are strict guidelines for selective logging within forest reserves, clear felling is practised in stateland forests. Unsustainable logging practices in the state owned forests that fringe the permanent forest reserves are also a major threat to the overall integrity of the ecosystem, destroying natural habitats, degrading the peat substrate and altering the peat swamp hydrology.

Deliberate fire. Another hazard relates to fires, especially those deliberately lit to clear land. This is seen as a cheap option that is easy for individuals to undertake in a degraded ecosystem. Setting fires is a dangerous activity within the peat land environment as it poses a direct destructive impact on natural areas and can develop into a serious local and regional health hazard through air pollution.

Alteration of the hydrological regime.

Serious problems can arise with the unauthorized or inappropriate alteration of the hydrological regime of river systems by creation of dams, weirs or tidal-gates, usually in relation to irrigation projects for agriculture or road, rail and electricity transmission, and gas or oil pipeline networks. Issues relating to water pollution from human waste and coastal-release effluents close to estuaries also stress or misuse local waterways.

Invasion of exotic species. The spread of exotic species in the landscape and waterways poses a threat to the integrity of the local ecosystems and can undermine efforts for conservation and sustainable use of endemic, endangered and vulnerable fauna and flora.

Commercial Non-Timber Forest Products Trade

Extensive harvesting of non-timber forest products is a cause for concern despite a lack of direct evidence that there is over-harvesting. Urban demand for ornamental plants and traditional herbs, and an appetite for exotic meats drive this trade. The local knowledge and skills of the Orang Asli Jakuns in the area together with the lack of alternative jobs provides middlemen the access for harvesting non-timber forest products. The underlying issue is the lack of forest resource guidelines and management planning for sustainable extraction of non-timber forest products.



INTEGRATED MANAGEMENT PLANS FOR MALAYSIAN PEAT SWAMP FORESTS

Management Plans Adopting a Multisectoral Approach

The project's immediate objectives at each of the three selected sites are to develop and implement plans and encourage processes that ensure conservation and sustainable use of peat swamp forests; and to demonstrate a multisectoral approach in planning sustainable peat swamp forest management.

The primary purposes of the management plans are explicit –

- to conserve biological diversity;
- to maintain physical functions of peat swamp forests;
- to promote sustainable use of peat swamp resources.

A multidisciplinary overview provided a rapid ecological assessment, identified threats and documented problems affecting each of the project sites and provided an initial multidisciplinary outlook for the development of further activities and the management plan. The management plans will incorporate provisions for continuing the monitoring and evaluation of the project sites once the project is completed.

Progress in Achieving Objectives

By the time of the mid-term project review in 2005, substantial progress had been made towards fulfillment of these expectations. Of particular significance has been the enhancement of the integrity of the peat swamp forests by consolidation of

existing areas and, where feasible, the preservation of the connecting areas between peat swamp localities.

Processes that have been leading to the decline of peat swamp forest biodiversity are being slowed or halted and mechanisms for addressing the more critical issues have been developed. In particular, the adoption of approaches involving multisector agencies (State Project Steering Committees and Management Plan Core Teams) and regional planners are already ensuring that a permanent institutional structure is being created to implement plans and strategies and address future challenges; and key government agencies have assumed a strong sense of ownership – a crucial factor in assuring sustainability.

A significant amount of information and data on peat swamp forests has been generated by the project and will be consolidated in permanent databases, monitoring and management procedures. Coordinating bodies have been established in the three states and, while initially servicing the three sub-projects only, are in the process of being institutionalized for continued integrated management of wetlands and wetland issues. The sub-projects and publicity relating to their activities have raised public awareness of peat swamp forest issues, particularly in each of the three states directly concerned. Capacity has been developed at various levels for staff (focusing on management), support staff (in field activities) and local communities (alternative livelihoods).

A Participatory Process

The process in each instance aims to encourage the key government agencies to collaborate in defining the particular conservancy needs and identify best practices for conservation and sustainable development. This participatory process is creating opportunities for–

- incorporating inputs from the various state agencies;
- promoting intersectoral coordination;
- strengthening local institutional capacity;
- creating a sense of ownership and acceptance of the management plan;
- ensuring commitment to implementation of the plan;
- resolving issues through local consultation and realistic remediation measures.

Progress in Preparing Management Plans at the Three Project Sites

Achievements of Management Plan Core Teams (MPCTs) at the mid-term stage of the project have been substantial despite unavoidable delays and the difficult task of consulting and reaching a consensus with widely diverse groups of stakeholders.

Loagan Bunut National Park, Sarawak

The MPCT in Sarawak has produced the outline of an integrated management plan focusing on the processes of the Lake Loagan Bunut ecosystem and the serious threats of sedimentation and pollution. Additional appraisals have been initiated to address socio-economic issues and biodiversity. MPCT membership has been expanded to include the Sarawak Forestry Corporation, and further consultation is planned with bodies such as the Special Parks Committee that represents local communities and nearby oil palm estate owners.

Klias Peninsula, Sabah

The Sabah MPCT has completed a first draft of the Klias Conservation Plan which is a section of the main plan. Other plans being developed include the Ecosystem Protection Plan and a Biodiversity Conservation Master Plan. The MPCT has analyzed the key ecological attributes and the critical threats to peat swamp areas. Key conservation strategies have been prioritized. Following feedback from state agencies there will be further stakeholder consultation with others such as plantation owners located adjacent to the core zone protected areas.



South-East Pahang Peat Swamp Forest

In Pahang, the MPCT has prepared an initial draft of the integrated management plan and is promoting the SEPPSF and its environs as **Environmentally Sensitive Areas** under the Town and Country Planning Act in an attempt to protect the integrity of the broader wetlands system. Operational guidelines have been developed to regulate logging in adjacent statelands; a series of buffer zones has been proposed on outer margins and rivers; and acquisition of fragmented peat swamp areas for rehabilitation has been recommended. Incorporation of elements of the draft management plan into the Pekan District Structural Plan was a major step towards institutionalizing peat swamp safeguards. Consultation with stakeholders such as local communities, plantation owners, land contractors and loggers is on-going and new inputs to hydrological findings and socio-economic studies demand constant updating of databases and plans.

LESSONS LEARNT

Donor Partners

The project is unique in the sense that it is the first time the Government of Malaysia has worked with two different donors in a single project. This demonstrates an advanced level of coordination between donor agencies in tackling sustainable development issues in developing countries.

Project Design

The original project design was perceived to have a number of weaknesses especially in the link between development of management plans/actions and their implementation. Project designs need to be screened to ensure that the development of the IMP is completed in the first half of the project and provisions are made to commit the State to implement some of these action plans before the end of the project.

Reliable indicators of achievement (verifiers) need to be provided to monitor progress of the project. In this project, a number of indicators were retrofitted and are providing better direction to the implementation of the project.

Project Management

State Project Steering Committees are chaired by the State Secretary Office in Sabah and Sarawak and by Director of State Economic Planning Unit in Pahang. This has provided the highest authority commitment in the management of the project. The approach to use Core Team that reports to the State Project Steering Committees has worked well in forging interagency linkages and in dealing with complex resource management issues and should be promoted in other projects and states.

Project Implementation

Care is required with multi-donor projects to ensure that interdependent project components are well coordinated to achieve maximum benefits and synergy. Lack of coordination can lead to the inputs of some donors not being adequately tailored to the specific needs of the project

Integrated Management Plans

The project has succeeded in assembling a core group of people from all technical and policy agencies involved to discuss and develop the Integrated Management Plan. While the Project Support Unit provided guidance and directions for this discussion, the actual input and planning came from the members of the Core Team. This is a major contribution by the project since it allows for a consultative integrated management plan rather than the usual consultants' plan. This process has a more constructive outcome although it tends to be a slow process. The subsequent implementation of the Integrated Management Plan will be facilitated by the early buy-in to this process of these technical and policy agencies.

Land-Use Policy and Integrated Wetlands Ecosystems

Awareness on the importance of integrating the management of the peat swamp forest with other wetlands at the highest level is very vital in conservation projects like this. The Pahang state government has adopted the sensitive zones proposed by the project into the Pekan District Structural Plans by initiating the process of re-acquiring some of the

fragmented areas and introducing new regulatory measures in the adjacent state lands to prevent uncontrolled logging.

In the Klias Peninsula, the state government has decided to incorporate the Integrated Management Plan into the overall land-use plan of the Klias Peninsula. This allows the integration of the Klias Forest Reserve into the larger wetland ecosystem including the riverine and mangrove habitats of the Nabahan and Kampong Hidnian Forest Reserve and the Bakau Api-Api land mosaic. This represents a major expansion of the original area allocated to the project.

Effective Use of the Public Media

There is considerable potential in utilizing existing channels for awareness raising especially through targeting the media and providing them with not-too-technical resources. The global environment crisis has created widespread interest that it was possible to capitalize on with well-illustrated feature articles.

Other media possibilities include having a regular newspaper column, and inviting radio talk shows to undertake a series on the value of peat swamp forests.

Tapping the Potential of Local Communities

The project recognized the importance of local community involvement. Local awareness programmes and facilitating the visits of local leaders to visit other project sites have drawn people into the project and aroused their concern for peat swamp forest.

The approaches adopted have been participatory, not top down, enabling local people to have a voice and a stake in the project. This has been an exemplary experience for other government agencies wishing 'to win the hearts and minds' of ordinary people.

As a result of a Participatory Rural Appraisal (PRA) study, a pilot project on 'Traditional Asli Jakun Medicinal/Heritage Garden' in Kampung Simpai, South-East Pahang Peat Swamp Forest is being undertaken to help conserve plants used by the community to make handicraft. This garden will provide herbal plants that could provide supplementary livelihood to the local community.

Interactions with Other Stakeholders

In future, environmental impact assessments for land development around the peat swamp forests have to be more specific in their assessment of impacts and in recommending mitigating measures. In this respect, more concrete interactions needed with plantation and logging companies to sensitize them on the importance of these mitigating measures on reducing impacts of soil sedimentation, and hydrological problems and pesticides pollution.

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