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SUSTAINABLE FOREST MANAGEMENT IN MALAYSIA - GUIDELINES FOR CONFLICT RESOLUTION

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"What of thee I dig out, let that quickly grow* over*, let me not hit thy vitals, or thy heart".

Hymn to the Earth, Atharva Veda

A. INTRODUCTION

The Malaysian forest is a biotic community which stirs the human imagination, and understandably so. It is one of the most dramatic and awesome biological systems on earth. The outstanding feature of the biotic community in the Malaysian forest is its richness and diversity which is brought about by biogeographic, ecological and evolutionary factors (Refer Table 1 for a classification of Malaysian forest ecosystems). In almost every major plant and animal group, there are more species than in temperate forests (Southwick, 1976:349). The variety of flora and fauna function in an intricate symbiosis projecting an image of continuous vitality, variety, resilience and abundance.

Since early times the Malaysian forest played a significant role in man's relationship with his environment. Technologically inferior societies with superior values of man-environment relationships evolved a cautious, caring and even revering relationship with the forests. Timber, fruits, bark, cane and other produce were extracted; game was hunted; the land was cleared for agriculture; solace and wilderness sought; the aesthetic traits appreciated and the innumerable spirits of the forests appeased. Where potentially harmful practices existed as in swidden agriculture, small population numbers with comparatively low or subsistent standards of living ensured that the forests' intricate balance was unharmed. There existed an ecologically sound balance between the forests' extractive, protective, recreational and aesthetic functions.

The advent of modernised development with its emphasis on the extractive industries, the extension of cultivated land and the clearing for a host of economic activities has seen the rapid dwindling of the extent of these forests. A hundred years ago almost all of Malaysia was covered by forest. Barlow (1978) estimates that in 1876 as little as 2 percent of the forest had been cleared. Then at the turn of the century rubber was introduced and its rapid expansion led to significant loss in forest land in the west coast states of Peninsular Malaysia. Even then, at the time of independence in 1957, at least 85 percent of Peninsular Malaysia was still covered in forest, (Ooi, 1978). Since 1960, the pace of clearing has reached alarming rates. The balance has been shifted to enhance the short term extractive function thereby sacrificing the crucial protective, recreational and aesthetic functions. Conflicts between the different uses and users of the forest have become more frequent.

This paper traces the alarming pace of forest clearance in Malaysia during the past 35 years and highlights the nature and extent of the damage caused in the process. It then examines the legal regime for management of the forest (general laws and measures, and governance structures). The paper finally, by way of case studies, identifies the conflicts that arise with the use of the forest and the conflict resolution mechanisms that have been, and can be used, by disputants to forest resources.

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TABLE 1 Forest Ecosystems in Malaysia

I. Terrestrial/Dryland Forest

1. Lowland Dipterocarp Forest (LDF on alluvial terraces
2. Hill Dipterocarp Forest (HDF)
3. Mixed Dipterocarp Forest (MDF)*
4. Upper Dipterocarp Forest (UDF)
5. Montane Oak Forest (MOF)
6. Montane Ericaceous Forest (MEF), including Subalpine Forest (SAF)
7. Heath Forest (HF)
8. Forest on Limestone (FOL)
9. Forest in Ultrabasic Soil (FUS)
10. Forest on Quartz Ridges (FQR)
11. White Meranti-Gerutu Seasonal Forest
12. Schima-bamboo Forest (SBF)

[Note: * There is no altitudinally recognised/categorised types of flora of Sabah and Sarawak as the change of flora types is continuous with altitude. HDF is not a recognised category; upland forest dominated by dipterocarps in the emergent canopy is termed MDF.]

II. Wetland Forest

II.A Freshwater/Riverine Forest
1. Riparian Forest
2. Freshwater Swamp
3. Gelam Swamp Forest
4. Peat Swamp Forest

II.B Estuarine/Coastal Forest
1. Mangrove Swamp Forest
2. Nipah Swamp
3. Coastal Strand or Beach Forest

Source: Ministry of Science, Technology and the Environment, 1997:29

The paper is presented under the following sub-headings:

A. Introduction
B. Loss of forested land
   1. Land development for agricultural settlements
   2. The Timber Industry
   3. Environmental Impact of Jungle Clearing
   4. Construction of Dams
   5. Other Uses
C. Forest Management – Protection and Conservation
   1. Resource Base
   2. Resource Allocation
   3. Resource Management
      a. Constitutional Imperatives
      b. Land Capability Classification
      c. Land Codes
      d. Land Conservation Act 1960

e. Forestry Laws
f. Environmental Quality Act 1974 and EIA

D. Conflicts Over Forest Use and their Resolution
1. Federal-State Conflicts
2. Conflicts over Preservation of National Parks and Game Reserves
3. Conflicts over Logging
4. Conflicts over Dam Construction

E. Conflict Resolution Mechanisms

F. Conclusion

B. LOSS OF FORESTED LAND

1. Land Development for Agricultural Settlements

At the time of independence, Malay (sia) was well-known mainly as one of the world's chief rubber and tin producers. Pre-independence agricultural development however had evolved a dualism of large capitalistic foreign-owned estates employing cheap imported labour and a smallholder and peasant sector characterised by uneconomic holdings, indebtedness and poverty. Equating rural poverty primarily with landlessness the government drastically cut back on private sector participation in agricultural colonisation and undertook public sector land settlement projects. The rationale behind this policy decision is simple. The post-independence government had no desire to pursue, or even consider, a policy that would affect the structure and ownership of the plantations as was popular amongst other radical newly independent governments at that time. It felt that the country had adequate land resources to be developed and distributed to the landless peasants. This programme was considered as suitable for two other reasons: first, land could be developed and alienated in blocks to groups of people thus avoiding the disadvantages of the previous system of land alienation to individuals (i.e. administratively, land alienation through resettlement was very acceptable); secondly, nucleated settlement villages were more convenient and amenable to upgrade the social and community status of the uprooted poor because it was much easier to provide social amenities such as schools, water, electricity, etc. in these settlements. A new authority called FELDA was set up in 1956 to plan and implement the above resettlement objectives.

The first few years were difficult for FELDA. There was a lack of experienced personnel, the State Governments which had to first agree to alienate the land were slow to respond and the response from the target groups was wanting. However, from the mid sixties rapid progress was made. By the mid 1960's there was a mania for land development in the country and a number of agencies doing practically the same thing were created at both federal and state levels. The inevitable result was competition in the rush for forested land for land development projects.

During the Second Malaya Plan (1961-1965), public sector participation totaled 216,000 hectares. In the First Malaysia Plan (1966-1970) period 131,600 hectares were cleared. The pace of clearing was increased during the next decade. During the Second Malaysia Plan (1971-1975), 323,607 hectares were developed. Development peaked with a further 422,404 hectares in the Third Malaysia Plan period (1976-1980). Land clearing for agricultural development continued over the ensuing years. By 1995, the public sector land development for new agricultural settlements totaled 1,957,186 hectares (see Table 2). During this period the private sector too continued to open up new land – at around 60,000 hectares for each development plan period and peaking at 123,090 hectares during the Sixth Malaysia Plan (1991-95). It is estimated that a total of 2.5 million hectares of forested land were opened for agriculture from 1960 to 1995.

2. The Timber Industry

The rapid growth of the timber industry since independence has compounded the problems associated with large scale forest clearing for land development. Between

1960 and 1975 log production increased from 3.2 million tons to 10.8 million tons and sawn timber from 791,700 tons to 2.6 million tons. Between 1965 and 1975, plywood and veneer production increased from 55.67 million m^3 to 81.78 million m^3. By 1970, Malaysia achieved the dubious distinction of being the world's largest exporter of tropical hardwood logs and sawnwood. Since then significant downstream development has occurred.

TABLE 2 New Land Development by Federal and State Agencies

Year	Hectares
1961 – 65	216,000
1966 – 70	131,600
1971 – 75	323,607
1976 – 80	422,404
1981 – 85	335,745
1986 – 90	360,470
1991 – 95	167,360
Total	1,957,186

Source: Five Year Plans, Malaysia No. 1 to No. 7

The forestry and timber sector is an important resource base for industrial development and the number of sawmills and plywood factories have grown significantly. The wood-based manufacturing sector also provides immense employment opportunities. In 1996, the forestry sector contributed about RM 14.05 billion or 7.3% of the country's total export earnings. State revenue from this sector aggregated around several billion ringgit in the form of timber concessions, royalties on log production and silviculture and development cess. The forestry and timber sectors provided direct employment opportunities to more than 150,000 people (Ministry of Science, Technology and the Environment, 1998, 7).

The diversity of tropical hardwood flora existent in the tropical forests and the carelessness with which forestry was approached generated a host of ecologically unsound and economically wasteful culture in forest. The standing stock of timber in the tropical forests varies according to forest type. In harvesting these forests, only a small fraction of the timber volume is removed. In Malaysia, only 30-40 per cent of the timber volume is actually harvested. From a stock of 7,500 species of seed plants containing 2,900 tree species, there are about 1,680 species of timber trees in Malaysia. Of these only 400 species have commercial importance and less than 10 per cent are preferentially harvested (Furtado, 1979:96). There is an obvious need for developing technology and uses for and marketing of a greater variety of timber species. This has been the focus from 1991 (Seventh Malaysian Plan, 1996, 599).

In the past tremendous amounts of valuable timber were released and made available to the industry at low cost. Rapid development of the timber industry and structural changes have resulted in large investments on the milling and processing of the timber and with it the concommittant increase in demand for logs. During the period of expansion the state forest departments failed to properly control the size of the timber industry consistent with the carrying capacity of the resource base. Until the late 1950s, the 300 metres contour was arbitrarily taken to separate the `lowland' forests from the `hill' forests. The lowland forests, because of their richness in useful species, their accessibility, and their regeneration capacity, constituted the country's productive forests. The rapid rate of forest clearance, however, has meant that some states are no longer able to provide sufficient logs for each mill and in several states the timber industry as a whole is already facing inefficient operation. The powerful timber lobby would not allow the conservationist to further starve it of logs. When lowland forests became scarce the industry managed to have the authorities re-demarcate the boundary between the `productive' forests and the `hill' forests from 300 metres to 1,000 metres. Future clearance would definitely push this boundary higher. Forests above 1,000 metres are associated with terrain too steep to exploit, and if cleared would entail erosion hazards (Malayan Forester, 1970).

3. Environmental Impact of Jungle Clearing

A direct and obvious outcome of the rapid clearance of forest areas is soil erosion. Soil erosion will immediately cause a loss of soil fertility and the break down of soil structure, consequently resulting in the impoverishment of the remaining soil. All this will have an adverse effect on its capacity to support agricultural crops or the regeneration of the forest. Future agricultural and forest productivity will therefore be reduced (Aiken & Moss, 1975).

In areas being developed for agriculture, there is often a protracted interval between clearing the forest and planting the crop during which time soil erosion can be excessive. This is especially so now when agricultural colonization is being stretched into the marginal areas and upstream where the magnitude of disturbance to the environment is greater. Of special concern is the mode of clearing adopted. Vast areas are clear felled, the saleable timber extracted and the rest removed by burning. The access roads are then built and the land leveled before planting takes place. The time span between felling and planting takes months and in instances even years. The exposed land is subject to heavy erosion and denudation. This process is often aggravated by the capital intensive nature of the exercise. Heavy tractors, bull-dozers and trucks increase compacting of the soil. When the land is not flat, as is the case of the later resettlement projects, the compacted top soil prevents the rain water from percolating slowly into the ground. It has been suggested that since all the areas developed for agriculture are devoted to tree crops, once the new vegetation gives cover, conditions will be similar to the original state (Albrook, 1973). However, it has been observed that in the Malaysian virgin forest, the presence of several tree storeys, as well as dense undergrowth, results in a larger interception of precipitation than in a cultivated rubber (or oil-palm) plantation (Teoh, 1973). Be that as it may, the 2-3 years before the tree crops can be considered to be effective replacement would, despite the planting of a cover crop, already have created damage.

Logging practices in Malaysia are generally carried out by a combination of crawler tractor-winch lorry or crawler tractor-wheel skidder. More than 90% of the logs extracted in Malaysia are carried out by crawler tractors (Ministry of Science, Technology and the Environment, 1997, 66). Such harvesting practices, even if selective in nature, involve damage to very large extents of the forests. It is estimated that 50-70 per cent of the forest area is damaged while felling only 10 per cent of the area under timber. The system of crawler tractors and winch lorry or wheel skidder was devised for the lowland areas. The locational shift in logging to the more mountainous areas has made it necessary to change the structure and methods of the logging industry. A study done by the Logging Training Centre, Trengganu, in Bukit Kesing (300-1960 feet above sea-level) indicated that on steep hills approximately 5 per cent of the land is actually bulldozed or had its soils disturbed to allow for road building and skid trailing (Ellis, 1976).

The skidding of logs often gouges deep, trough-like furrows in the soil mantle, which are ideal for concentrating run-off and initiating deep gullies. There is a gentle deficiency of quantitative studies of the effects of logging upon erosion in Malaysia. Burgess (1971) notes that gullies up to 4 metres deep can be found on abandoned logging tracks. Peh (1980) and Brooks, Richards and Spencer (1993) record similarly devastating impacts. Studies in other parts of the world quantitatively demonstrate the adverse effects more fully (Frederickson, 1963 and Lull & Reinhart, 1963).

The most damaging factor in forest exploitation is undoubtedly the construction of a network of roads and tracks. In Malaysia, the effects of logging road construction upon soil erosion are likely to be more adverse than in many temperate areas on account of the deeply weathered profiles frequently encountered (Salleh and Tang, 1972) and the climatic conditions in those areas where timber production is increasingly being concentrated. Roads are usually about 4 metres wide and are commonly `daylighted' with a clearing of vegetation within less than 20 metres on either side. The extent of the road and track network in logging concessions varies according to the nature of the terrain and the stocking densities of exploitable trees. Surveys conducted in 10 concession areas in Peninsular Malaysia have shown that in difficult terrain (slopes

steeper than 31^{o}), there are, on average 8.7 kilometres of roads and tracks per square kilometre (22.6 miles per square mile), in comparison with an average of 9.9 kilometres per square kilometre (25.6 miles per square mile) in medium terrain (slopes of $17\text{-}31^{0}$) and 13 kilometres per square kilometre (33.5 miles per square mile) in easy terrain (slopes of less than 17^{0}) (FAO, 1973). The

magnitude of the damage multiplies when in illegal extraction, which is not inconsiderable, a total abandonment of healthy practices is made. The damage enhances soil erosion and flooding renders the habitat unsuitable for a great variety of forest dwelling animals and thereby causes the loss of invaluable genetic material.

Over the years the authorities have focussed on improving timber harvesting practices. A Selective Management System is being encouraged. Since 1993 helicopter logging has been practised in parts of Sarawak but even here a mix with conventional logging methods is employed. Only in Sabah is Reduced Impact Logging practised (Ministry of Science, Technology and the Environment, 1997, 66). There has also been increased monitoring of forest resources with the use of remote sensing and Geographical Information System (Seventh Malaysia Plan, 1996).

4. Construction of Dams

Another major cause for the loss of forest land in Malaysia is the construction of dams or impounding reservoirs for hydroelectric power, water supply and for irrigation schemes. Tho (1991) estimates that the total area of forests flooded as a result of dams built in the country could be well over 100,000 hectares and this does not include the Pergau dam and the now suspended Bakun dam.

5. Other Uses

Deforestation and degradation of the forest occurs not only with agricultural colonisation, logging and dam construction but also with a host of other activities. Mining activities cause extensive damage and leave behind retention ponds and sand piles. Highway construction, aquaculture and pollution also take their toll. Shifting cultivation which though not very significant and declining in Peninsular Malaysia (Bernard and De Koninck, 1997), is one of the major causes of forest degradation in Sabah and Sarawak (Sham Sani, 1993, 31). Maranjan and Dimin (1989) estimate that about 28 percent of the total land area in Sarawak has been affected by shifting cultivation, an estimate they derived at after analysing the 1985 Landstat imagery. It is conceivable that a large area of Sabah is similarly affected.

C. FOREST MANAGEMENT – PROTECTION AND CONSERVATION

In the past, emphasis on economic development had relegated environmental issues to the background. There was a tendency to ignore the concept of environmental stability. Emphasis was placed on immediate and measurable economic gains, a trend that has been common throughout South-east Asia (Conway and Romm, 1973). Of recent, there is evidence of increasing official and public concern over environmental conservation. The Federal Government's policy on environment matters was made explicit in the Third Malaysia Plan (1976-1980). In a chapter entitled `Development and Environment', it was suggested that:

> "It is vital that the objectives of development and environmental conservation be kept in balance, so that the benefits of development are not negated by the costs of environmental damage".

(Third Malaysia Plan, 1976:218)

A chapter on the Malaysian Environment has been included in the Fifth, Sixth and Seventh Malaysia Plans – an indication of the growing awareness and concern for the environment.

Increasing public concern over environmental matters is also evident from letters to the newspapers and from the activities of a number of environment and conservation groups, many of which are of relatively recent origin. The Malayan Nature Society has long advocated the need for conservation (Wyatt-Smith, J., 1961; Soepadmo and Singh, 1973). The Environmental Protection Society of Malaysia and Friends of the Earth Malaysia (Sahabat Alam Malaysia) are now very prominent. In recent years the consumers' associations of the various states have also focussed on sustainable development. However most of these groups are urban-based. The settlers in the rural FELDA schemes, and other rural population not directly affected in an adverse manner by ecologically unsound development, have not expressed concern.

The local groups have been greatly assisted by the presence in the country of the World Wide Fund for Nature, Malaysia (WWFM) and the Wetlands International Asia-Pacific, both of which ably combine scientific research and expertise with networking and advocacy.

It is evident that the Malaysian forest needs to be managed so as to generate the maximum sustainable returns for economic growth of the nation cognizant always of the crucial protective, recreational and aesthetic functions it discharges. A policy that accommodates and balances the conflicting objectives in forest management needs to be implemented. Malaysia's efforts at sustained viability can be reviewed by focussing attention on three major areas;

(1) Resource Base
(2) Resource Allocation and
(3) Resource Management

(1) Resource Base

The first National Forest Inventory in Malaysia was conducted in 1962. The exercise was repeated between 1970 to 1972 using aerial photography techniques of scale 1:25,000, and updated in 1981 and 1982 using 1:40,000 aerial photographs. Another inventory using GIS techniques of Peninsular Malaysian forest is currently underway (Seventh Malaysia Plan, 1996, 599). Malaysia still has large areas under forest. Approximately 18.91 million hectares or about 57.5 percent of the total land is forested. (Refer Tables 3 and 4). The bulk of the remaining unharvested primary forest lies in the east coast states of Peninsular Malaysia (Pahang, Trengganu and Kelantan) and in the East Malaysian states of Sabah and Sarawak.

The National Forest Inventories and the preceding Forest Resources Reconnaissance Survey provided data for macro-planning of the timber industry in Malaysia. Forest resources appraisals aimed at providing data for the formulation of forest land use and management plans on a Forest Management Unit basis were then undertaken. Also completed is an inventory of disturbed forests which was done to obtain data for forest regeneration and development purposes.

The forest in Malaysia is comprised mainly of lowland and hill dipterocarp. There are also extensive areas of peat swamps and mangroves, and less extensive areas of freshwater swamps, highland forest and special communities such as those found on limestone, quartz and ultrabasic rocks, calcerous soils and others (Table 1).

Though much inventory data is available of timber types, research into other aspects of the flora and fauna of the Malaysian tropical forest is still at its infancy (Furtado, 1979, 88). The flora and fauna of Malaysia is exceedingly rich. It is conservatively estimated that the Malaysian forests contain about 15,000 species of named flowering plants (9% of the world's total), and more than 1,000 species of ferns and fern allies. Many of these are unique and are found nowhere else in the world (Ministry of Science, Technology and the Environment, 1998, 2). There is also a great variety of fauna in the country. In the vertebrates, there are about 300 species of wild mammals, 700-750 species of birds, 350 species of reptiles, 165 species of amphibians and more than 300 species of freshwater fish. A conservative estimate is that there are more than 100,000 species of invertebrates. These include about 1,200 species of butterflies and 12,000 species of moths. Little is known of other groups (Ministry of Science, Technology and the Environment, 1998, 3). The microorganisms are very poorly known .

The economic importance of the inventoried trees, the growth increment of particular species, indeed, the full range and potential of the flora and fauna of the tropical forest still waits to be discovered. Lowry (1971) for instance contends that the tropical moist forests of South-east Asia contain plant species producing secondary metabolites such as insecticides, colouring matter, essential oils, drugs and medicine, saponins and base compounds which can be modified. These however have not been surveyed fully. Furtado (1979) concludes that the genetic status and potential of a moist forest flora are poorly known thus calling for comprehensive botanical surveys.

TABLE 3 Extent of forest cover in Malaysia in 1997 (million hectares)

	Peninsular Malaysia	Sabah	Sarawak	TOTAL
PFE	4.68	3.60	6.00	41.28
* Productive	2.78	3.07	5.00	10.85
* Protection	1.90	0.53	1.00	2.12
National and Wildlife Parks	0.74	0.38	1.00	2.12
Stateland Forest	0.43	0.47	1.61	2.51
TOTAL	5.85	4.45	8.61	18.91

Total Land Area = 32.86 million hectares

Source: Ministry of Science, Technology and the Environment, 1998, 8.

TABLE 4 Distribution and extent of the major forest types in Malaysia in 1997 (million hectares)

	Peninsular Malaysia	Sabah	Sarawak	TOTAL
Land Area	13.16	7.37	12.33	32.86
Dipterocarp	5.38	3.83	7.20	16.41
Swamp	0.30	0.19	1.20	1.69
Mangrove	0.10	0.32	0.20	0.62
Total Forested Land	5.85	4.45	8.61	18.91
Percentage of Forested Land	44.5	60.4	69.8	57.5

Source: Ministry of Science, Technology and the Environment, 1998, 9.

Amongst the fauna only a few groups such as the birds, mammals, snakes and fishes, economic insects and butterflies are well known whilst the invertebrates are generally poorly known.

An area where the potential of the forest is realised is its contribution to water quality. Clearing the forests will bring the attendant problems of too little, too much and too dirty water – drought, floods and pollution. However important data has to be generated by way of identification and mapping of `partial-source' areas of all river basins in the country since these areas are essentially the critical sources of run-off in river systems. Most of these areas are adjacent to water courses, in floodplains and acquifer-like depressions and it is important that they be conserved as far as possible. It is also necessary that the dynamic parts of the run-off generation areas at present under natural forest vegetation in the headwater regions be identified so that they may be preserved for the sole purpose of generating a sustainable clean water yield. Upland forested areas have to be earmarked for reservoirs and identified as critical upland drainage basins (Low and Peh, 1982). The water supply shortages which plagued parts of the country in 1997 and 1998 have caused a greater appreciation of this aspect.

Many of the structures and processes that operate and the vast potential of the forests' resource base is little known. Unless a greater appreciation of the forest's potential exists, a balanced management policy will not eventuate.

(2) Resource Allocation

To view the tropical rain forest as a renewable resource has probably been its greatest curse. Indeed what is clear is the incapacity of the rain forest throughout most of its extent to regenerate under present land-use practices (Gomez-Pompa et al, 1972). Even if regeneration is possible, the nature and type of regeneration that will evolve will be suitable only for a limited number of the functions that undisturbed tropical forest currently play. The magnitude of disturbance between clearing and regeneration may be similarly unacceptable. Hence it is crucial that in the allocation of forests for their many competing demands sufficient stands of undisturbed permanent forests are established.

Prior to 1972, forestry in Malaysia was guided by the Interim National Forest Policy. With the establishment of the National Forestry Council in 1972, a National Forestry Policy was formulated and accepted by the Council in August 1977. In 1978, the Council approved the setting up of the Permanent Forest Estate (PFE) amounting to 12.73 million hectares at that time but now enlarged to 14.28 million hectares. The PFE is a term for the sum of forest reserves, areas maintained or managed for their economic, social and ecological benefits. There are four categories within the PFE:

(1) **Protection Forests** aimed at sound climatic and physical condition of the country, soil fertility and environmental quality, and minimization of damage by floods and erosion to rivers and agricultural land,
(2) **Production forests** intended to ensure supply in perpetuity of forest produce, principally timber for domestic purposes and export earning,
(3) **Amenity forests** for recreation, and protection of the country's flora and fauna, and
(4) **Education and Research Forests**

The National Forestry Department which implements the National Forestry Policy estimated even in the inception year of the policy in 1978 that much of the Permanent Forest Estate will be given over to productive forests (Mohd Darus, 1978). This has proven to be so. Between 1978 and 1994, approximately 1.4 million hectares of PFEs (mostly lowland forest) were degazetted. These areas do not include the large areas of converted stateland forests, estimates for which are not available. The National Forestry Act 1984 (sections 10-14) stipulates the need for equal replacement of every hectare of degazetted PFE. Unfortunately there is no mention of compensating with forest land of equal or greater quality. As of 1994, despite pledges to gazette 186,341 hectares of PFEs, seven state governments had failed to fulfill their pledge (Ministry of Science, Technology and the Environment, 1997, 64). The total area under forest in Malaysia presently is estimated to be 18.91 million hectares or 57.5 percent of the total land area (Table 3). Of this 14.28 million hectares are designated as Permanent Forest Estate. However only 2.12

million hectares of this are protection forests whilst 10.85 million hectares are productive forest and hence will be logged and foraged for rattan, medicine, oil and flavour, and wild plants (Ministry of Science, Technology and the Environment, 1998, 8).

There are also a total of 2.12 million hectares of National and Wildlife Parks and 2.51 million hectares of State Land Forest. The latter will no doubt also be the subject of logging concessions. The allocation has paid little emphasis to the protective role of the forests and the costs that will be incurred by the nation will indeed be high. Moreover, the specific areas for the four categories of forests are not yet all demarcated. It would be opportune that this be attended to urgently. But as will be discussed later, there are peculiar aspects of Malaysian forest management that make this difficult.

(3) Resource Management

The unsatisfactory management of the forests in Malaysia is largely linked to the manner in which the resource base is structurally organised.

(a) Constitutional Imperatives

The constitutional provisions pertaining to the separation of powers in the Malaysian federation are governed by Part VI of the Federal Constitution. Article 74 defines the extent of the legislative powers of the federal and state legislatures and does so by referring to three lists which are set out in Schedule 9 of the Constitution - the Federal List, the State List, and the Concurrent List. Any matters not included within these Lists, i.e. the residual powers, are regarded as state matters (Article 77). Parliament has legislative powers over matters in the Federal List and the respective State Legislative Assemblies have the powers of legislation over matters in the State List. Matters in the Concurrent List may be legislated on by both Parliament and the State Legislative Assemblies but in the event of any inconsistency between a federal law and a state law, the federal law prevails and the state law, to the extent of the inconsistency, is void (Article 75).

Land and forestry are enumerated in the State List and hence each of the 13 states is empowered to enact laws and formulate policy on land and forestry matters.

The Constitution provides for limited instances in which Parliament may, in spite of Schedule 9, make laws in respect to matters on the State List:

(i) to implement international agreements;
(ii) to promote uniformity of the laws of two or more States; or
(iii) if requested to do so by a state legislative. (Article 76(1)(a),(b) and (c))

In relation to (i) above any such law made by Parliament shall not be with respect to Islamic law or customary law, and not without consulting the State Government concerned (Article 76(2)). In relation to (ii) and (iii) above any such law takes effect only when adopted by the State Legislative Assembly, and then shall be deemed to be a state law and not a federal law, and may accordingly be amended or repealed by a law made by that Legislature (Article 76(3)).

In addition to these exceptions Parliament is empowered for the purpose of ensuring uniformity of law and policy, to make laws, *inter alia*, with respect to land matters including land tenure, landlord and tenant, and compulsory acquisition. In this case the law does not have to be approved by the state legislatures (Article 76(4)), unless such law seeks to confer executive power on the federation, and remains a federal law (Article 80(3)).

The Federal Government may exercise federal laws in particular areas of states even in relation to matters listed in the State List by two other means. First, it may do so by acquiring State Land compulsorily in the national interest for federal purposes (Article 83). Secondly, it may do so by proclaiming a development area for the purpose of implementing a development plan in the national interest(Article 92(1)). A "development plan" means a plan for the development, improvement or conservation of the natural resources of a development area, the exploitation of such resources, or the increase of means of employment in the area (emphasis added)(Article 92(4)).

A development area proclamation gives Parliament the power to legislate in pursuance of the development plan even on matters which are by virtue of Schedule 9 wholly within the legislative

competence of the state assemblies. This power has not so far been exercised and its potential for conservation not realised.

In relation to land (as in the case of local government) the Constitution recognises the need for uniformity between the States and co-operation between the Federation and the States. It provides for a National Land Council (NLC). The NLC consists of a Minister as Chairman, not more than ten representatives appointed by the Federal Government, and a representative of each of the States appointed by the Head of that State. The function of the NLC is to formulate, in consultation with the Federal Government, the State Governments and the National Finance Council, a national policy for the promotion and control of the utilization of land for mining, agriculture, forestry or any other purpose, and for the administration of laws relating to these subjects, and the Federal and State Governments are obliged to follow the policy so formulated. The NLC may also be consulted by the Federal or State Governments in relation to any land matter and must give advice thereon (Articles 91-94).

The East Malaysian states of Sabah and Sarawak (who in 1963 together with the 11 states of the former Federation of Malaya became Malaysia) have additional "safeguards" to protect their special constitutional position. Amongst these safeguards is that Parliament's powers to legislate with respect to land do not apply to Sabah and Sarawak and these two states retain exclusive legislative competence over land (Article 95D). Both states are represented in the National Land Council but their representatives may not vote and they are not obliged to follow any policy laid down by the Council. This position may be altered by Parliament only with the concurrence of the respective State Government. Also, no area in Sabah and Sarawak may be declared a development area without the consent of the State Government (Article 95E).

The constitutional imperatives thus far described have resulted in a curious mix of uniform and fragmented laws in relation to land and forestry. (Refer Table 5 for Laws Related to Forest Conservation in Malaysia). Some of these are described below.

TABLE 5 Laws Related to Forest Conservation in Malaysia

Peninsular Malaysia

- National Land Code 1965
- Land Conservation Act 1960
- National Forestry Act 1984
- Protection of Wildlife Act 1972
- National Parks Act 1980
- Water Enactment 1920
- Plant Quarantine Act 1976
- Environment Quality Act 1974

Sabah

- Land Ordinance 1956
- Forest Enactment 1968
- Fauna Conservation Ordinance 1963
- Parks Enactment 1984

Sarawak

- Land Code 1957 (Chapter 81)
- Forest Ordinance 1954 (Chapter 126)
- National Resources and Environment Ordinance 1949 (Chapter 84)
- Wildlife Protection Ordinance 1990
- National Parks and Reserves Ordinance 1956
- Public Parks and Greens Ordinance 1993

(b) Land Capability Classification

Between 1963 and 1976 a Land Capability Classification, similar in all the states of the Federation was introduced. The Land Capability Classification divides land use into five categories based on its potential productivity and economic yield:

- mining;
- agriculture with a wide range of crops possible;
- agriculture with a restricted range of crops possible;
- forestry; and
- conservation.

This five-fold classification is in a declining order of priority. Since its implementation there have been major land use changes that have been financially rewarding but compromised biodiversity and conservation issues. (Ministry of Science, Technology and the Environment, 1998, 6).

(c) Land Codes

Land laws and administration in Malaysia are governed by the National Land Code 1965 which applies to the Peninsular Malaysian states of the Federation except Penang and Malacca, both of which are governed by the National Land Code (Penang and Malacca Titles) Act 1963; the Sabah Land Ordinance 1956 (Cap 68) and the Sarawak Land Code 1957(Cap 81) which apply to Sabah and Sarawak respectively. Even the National Land Code, though a federal law made under Article 76(3) of the Constitution, did not seek to assume executive powers. Each of the states therefore, are competent and do administer land law in their respective states.

The National Land Code 1965, the Sabah Land Ordinance (Cap 68) and the Sarawak Land Code (Cap 81) do not provide for biodiversity or conservation uses of the land. Land is categorised on the basis of intended "uses" – agriculture, building and industry. Land law in Malaysia is thus geared to "use of land" for economic purposes rather than biodiversity maintenance and conservation. Unalienated land can serve these latter purposes but is dependent upon the decision of the 13 individual states for their continued non-alienation.

(d) Land Conservation Act 1960

The Land Conservation Act 1960 (Revised 1989), is a federal law made under Article 76(3) of the Constitution and was in the same year adopted by all the 11 Peninsular Malaysian states, but not by Sabah and Sarawak. The Act permits steep land that may be susceptible to erosion to be gazetted as "hill lands" where the clearing of vegetation (s. 6(1)) or the planting of short-term crops (s.5) is prohibited unless a permit is obtained. The Act would be a useful tool for protecting forests in steep land but few, if any, areas have been gazetted as hill lands. Enforcement of the Act is the responsibility of the Land Administrator or Collectors of Land Revenue (i.e. District Officers), who generally have little or no training in soil conservation. The Department of Agriculture and the Drainage and Irrigation Department which would be more capable of enforcing the Act are unfortunately not given any executive authority to enforce it.

(e) Forestry Laws

As noted earlier, the constitutional provisions also ensure state autonomy over forestry. Consequently, each of the 13 states is empowered to enact laws and formulate policy on forestry matters. The State Forestry Departments are responsible for the administration and management of the states forest resources, forest industries development and forest law enforcement.

Until 1984, the various states had their own forestry enactments, which were based on the Straits Settlements Ordinance 1908 (No. 22 of 1908) and the Federated Malay States Forests Enactment 1914 (No. 18 of 1914). These were primarily concerned with the removal of forest produce including timber and revenue collection. There were provisions enabling the state forestry

departments to specify conditions along with the licenses they issued, but this power was seldom exercised for conservation or sound logging practices.

In 1984, a federal law titled National Forestry Act 1984 was enacted under Article 76(1)(b) of the Federal Constitution and adopted by the 11 Peninsular Malaysian states in 1985 and 1986. The states of Sabah and Sarawak did not adopt the Act and in these states the operative law are the Sabah Forest Enactment 1984 and the Sarawak Forest Ordinance 1954. Even in Peninsular Malaysia, despite the adoption of the National Forestry Act 1984 by each of the states, they continue to be autonomous in forest management. The Federal Forestry Department which is under the Ministry of Primary Industries, is therefore reduced to a mere advisory capacity without much influence on the management of the resources. The federal agency's functions are confined to planning, research and development and the provision of technical advice, services and facilities for training. It is consequently difficult to synchronize the management of the forests between the various states.

(f) Environmental Quality Act 1974 and Environmental Impact Assessment (EIA)

Undoubtedly the most significant piece of legislation pertaining to the environment is the Environmental Quality Act 1974, a federal law to provide the legal framework for a co-ordinated environmental management programme. The Act provided for a new agency at the federal level, the Department of Environment (DOE) within the then newly formed Ministry of Science, Technology and the Environment. The early emphasis of the Ministry in exercising its powers was to reduce pollution by focussing on particular polluting industries.

The requirement for Environmental Impact Assessments (EIA) was not a part of the Act introduced in 1974. EIAs were first introduced in 1980 for three large projects, including the Kenyir Dam Project in Ulu Trengganu even before the establishment of the EIA Unit in the DOE. Over the next six years at least 39 projects were subject to EIA studies (Fifth Malaysia Plan, 1986-1990, 280). Then in 1985, the EQA 1974 was amended to insert a new section 34A making EIA mandatory. This was followed by the EIA Order 1987 which came into force on 1 April 1988. EIA are now mandatory for 19 prescribed activities many of which are important for sustainable forest use (Refer Appendix I).

The DOE has over the years issued guidelines for preparing EIA Reports for different types of activities, including:

- Guidelines for the Prevention of Soil Erosion and Siltation;
- Guidelines for Environmentally Sensitive Areas in Malaysia;
- Guidelines for Development of Tourist and Recreational Facilities in National Parks.

Guidelines for forestry are currently being prepared.

D. CONFLICTS OVER FOREST USE AND THEIR RESOLUTION

1. Federal-State Conflicts

The mismanagement of the forests by the separate states is in part due to the financial position of these states. The constitutional allocation of powers and duties to the states is far in excess of what their revenue sources can usefully sustain (Malaysian Constitution, Tenth Schedule; Abdullah Ayub, 1974.). The constitution also bars the states from raising loans without federal government consent. Constitutional and extra-constitutional grants help make up for the deficits faced by the states but clearly the greater the dependence of the states on central government aid via non-guaranteed grants, the less tenuous their autonomy. States have therefor sought to overcome their financial constraints by exploiting their resource base. Since forest revenue principally in the form of royalty and premium, accrue to the states, the forest policy of the states is one of rapid exploitation (Rachagan, 1981). This has been the situation since the early years of independence and is illustrated by the following example from Kelantan state.

The 1959 elections led to the federal government and the state government of Kelantan, being controlled by the Alliance Party (now enlarged into the Barisan Nasional or BN) and the Pan Malayan Islamic Party (PAS) respectively. Campaign promises of the Alliance had assured the people that an Alliance state government would cause the construction of the Sultan Yahya Putra Bridge across Kelantan River. Political prestige compelled the PAS state government to undertake to build the bridge. Short of finances, starved of any extra-constitutional assistance from the

Alliance controlled federal government, and constitutionally restrained from any borrowing, the PAS state government evolved a novel plan to finance the bridge. A concession of prime forested land was given for timber extraction to a private company, the Timbermine Industrial Corporation Limited, obtaining in return an advance payment of royalties amounting to RM2.5 million. The Corporation was required to pay royalty for the timber extracted but 50 per cent of the royalty payable was to be held back by the Corporation until the prepaid RM2.5 million was realised or refunded by the state government. The Federal Government's attempt to challenge the constitutionality of the arrangement on the grounds that the transaction was indeed borrowing was not upheld by the courts (Government of Malaysia v Government of the State of Kelantan [1968] 1 MLJ 129). The Federal government's position has since been imposed by way of a constitutional amendment (Constitution (Amendment) No. 2) Act 1971, s.8). The power of the states to alienate forest for timber is however not curtailed, and they continue to make ecologically unsound timber concessions.

Sound management of the forests may be possible only if alternative sources of revenue for the states are found and if these sources of revenue are made conditional on sound forest management. Alternatively, the Federal Government will have to rely on the Constitutional provisions which:

- allow it to acquire state land for federal purposes (this will call for conservation to be accepted by the courts as a legitimate federal purpose);
- Declare selected forest areas as development areas; or
- Use the powers of Parliament under Article 76 to make laws in respect of forest (basing its actions on the ground that it is implementing international agreements on conservation, bio-diversity and sustainable development).

2. Conflicts over Preservation of Parks and Reserves

National parks are fundamental in that they are often out-standing natural areas representative of the diversity of ecosystems which have been set aside so as to guarantee their protection and use for present and future generations for scientific, educational and recreational use. They perpetuate in a natural state representative samples of physiographic regions, biotic communities and genetic resources and species in danger of extinction to provide ecological stability and diversity. They offer substantial economic returns by promoting national and international tourism. Very importantly, the maintenance of national parks encompass intangible cultural values of great significance which strongly influence the quality of life of people. National parks however involve land that is vied for by potential alternative users for purposes of timber extraction, agriculture and settlement, mining, flooding for power generation and the like.

The amount of land currently dedicated to national parks comprises a small fraction of the total land area of the country (Refer Table 3 and Appendix 2). Forest degradation in even so designated areas is possible. In this the Endau-Rompin story is instructive.

The Endau-Rompin Forest Reserve consisting of 202,343 ha. of forested land embracing the steep sandstone terrain of Gunong Besar and its neighbouring hills is situated on the borders of Pahang and Johore states From within the area flow five of the more important southern rivers and their importance to the water economy of southern Malaysia were amongst the principal considerations that led the Malaysian Government declaring in its Third Malaysia Plan (1976-1980_ that it intended to turn the Endau-Rompin Reserve into a National Park. The proposal was based on an informal agreement reached in 1972 between the State Government of Pahang and the Federal Government. Under the agreement a limited amount of logging was to be permitted in peripheral areas of the reserve but a core area of 36.421 hectares was to be left inviolate for all time. When the logging in the peripheral area was completed, the whole reserve was to be turned into a national park. Even as late 1976 H.H. The Sultan of Pahang held that "a group of 10-15 Sumatran Rhinoceros, the largest known group in the world was found recently in the Endau-Rompin area" and "in response to this the State Government is in the process of gazetting a game reserve to save the species" (Rachagan, 1981).

Despite these pronouncements, the State Government of Pahang unilaterally set aside the understanding that had been reached and issued new logging licenses for exploitation of the core

area and destroyed what a joint front of scientific organisations led by the Malayan Nature Society termed as the "latest comprehensive representation of the rich southern forest ecosystem". A nation wide campaign and representations from the Federal Government, notwithstanding, the then Pahang State Secretary declared that

the National Park would only be set up after the state had fully exploited its economic potential and that "when it comes to choosing between human welfare and animal survival, the state had to opt for the former". The attitude of the State Secretary and the Pahang State Government reflects the dangerous tendency of equating what is clearly the selfish interest and welfare of a few with economic growth and with human welfare in general (Rachagan, 1981).

The Endau-Rompin affair is not the only instance of attempted and actual violation of national parks and game reserves. Environmentalists succeeded in causing the abandonment of the proposal to log the Pahang portion of Taman Negara in 1970 and in 1983, managed to foil the construction of the Tembeling Hydro-electric Dam over parts of the same park. Part of the Trengganu portion of Taman Negara has already been innundated by the Kenyir Dam. Sizeable portions of Templer Park in Selangor have been relinquished to mining, building, construction and road building. Parts of the

Kinabalu National Park in Sabah have been exercised for development whilst yet other parts have been subject to deleterious effects of copper mining.. The seriousness that the state governments place on their declarations of national parks and game reserves is reflected in the fate of Klias in Sabah. Klias, was gazetted as a national park in 1978 and was degazetted as such in 1981.

3. Conflicts over dam construction

1. The rapid growth of Malaysia's economy since independence, especially its shift to the industrial and manufacturing sector, has led to increased demands for energy. An energy policy, termed the four-fuel policy, was introduced in 1979. The policy identifies four primary sources for energy requirements – hydropower, coal, ore and gas – and proposes greater diversification of energy supplies from high dependence on crude oil and petroleum products. The long term objective is to be self reliant for energy, and expand other sources of energy supply so as to release more petroleum for export. To an extent, this has been achieved.

Malaysia's hydropower potential is considerable. However the share of hydropower as a commercial energy source has declined from 7.4 percent in 1985 to 4.4 percent in 1995 and the government has periodically looked at ways of expanding hydropower supply (Seventh Malaysia Plan, 1996).

Conservationists have raised concerns with regards large scale dam construction. The controversy surrounding the abandoned plans to build a dam across the Tembeling River in Pahang and the now suspended Bakun Dam in Sarawak will serve to illustrate the conflicts that arise.

The Tembeling Hydro-electric Project

The proposal to build a dam in Taman Negara, namely, the Tembeling Hydro-electric Project (THEP) was first mooted in October, 1971 when the National Electricity Board (NEB) recommended a multi-purpose dam across the Sungai Tembeling. The river is an upper tributary of Peninsular Malaysia's longest river, Sungai Pahang, in central Pahang. The proposal followed the catastrophic floods of January, 1971 which claimed 24 lives and necessitated the evacuation of some 150,000 people from their homes in the Pahang River Basin alone. Less severe but nonetheless major flooding occurred again towards the end of 1971. The need for flood mitigation and the hydro-electric power potential of the basin formed the principal considerations for the proposed dam (Rachagan, 1983).

The Tembeling Project estimated to cost in excess of RM300 million, would have consisted of a main dam, saddle dams and associated works, including an intake feeding through a power tunnel to a conventional surface power station. With a total installed capacity of 110 megawatts, the average annual output of energy, it was estimated, would be 441 million kilowatt-hours. A gated shaft spillway was provided for regulated flood discharges.

The main dam would have been a rockfill structure with a height of 67 metres (220 feet), and the six saddle dams would have involved earthfill construction. Total volume of fill in the dam

would have been 2.5 million cubic metres (3.3 million cubic yards) and the reservoir formed by the dams would have spanned 53 kilometres (33 miles) having a surface area of 250 square kilometres (96 square miles) (NEB, 26th and 27th Annual Report).

Since the initial proposal by the NEB in October, 1971 the project was the subject of studies by two teams of foreign experts - an Australian team was appointed in 1972 to undertake a study of water management and flood mitigation in the Pahang River Basin with special emphasis on the feasibility of multi-purpose dams, and a Russian consulting group appointed in 1973 to undertake a detailed pre-investment study for a hydro-electric project on the upper Tembeling.

The Malaysian Department of Wildlife and National Parks made its own impact assessment study and strongly opposed the project. On July 14, 1978 the NEB announced the indefinite shelving of the Tembeling project. In January 1982, the then Malaysian Deputy Prime Minister announced the revival of the Tembeling Hydro-Electric Project. This generated a nation-wide campaign against the dam project. The principal reason for the public outcry was that the project would have flooded a significant part of Taman Negara, Malaysia's oldest national park.

Taman Negara, covering an area of 1677 square miles was created from the 553 square miles Gunung Tahan Game Reserve in Pahang State created in 1925, and, portions of Kelantan and Trengganu. It was constituted by a common enactment written at different times for the three adjoining Malaysian states of Pahang (1939) Trengganu (1938) and Kelantan (1938) and dedicated "in perpetuity for the propogation, protection and preservation of the indigenous fauna and flora of Malaya". Despite the existence of other park areas in the country, Taman Negara remains the largest and most significant. Its land area exceeds the total extent of all the parks. Taman Negara is consequently an essential feature of sound ecological management of Malaysia and any attempt to alter or modify it would have dire consequences.

Taman Negara has 3 major river valley systems. The most important of these is the Sungai Tembeling followed by Sungai Atok and Sungai Lebir. The dam would have flooded the lowland of Sungai Tembeling and also affected the lowland area of Sungai Atok. It was estimated that an area of 37.3 square miles within the park and 42.4 square miles outside the park would be inundated. The inundated land would have comprised 13.5 percent of the 278.24 square miles of choice lowland of the park which is below 500 feet. The spread of the water however would have accentuated the disruptive effect and resulted in radical modifications in the transfer and extirpation of vegetable and animal species. The dam would have vastly reduced the already limited acreage of lowland forests in the country and limited habitat diversity and special vegetation type in the park area. The flooding would have disrupted the home range of more than 50 percent of the parks mammals – both large and small.

The dam would have required about 5 million cubic metres of earth and rocks for the construction of the main and saddle dams, with the latter requiring six times the quantity of the main dam fill. The bulk of this material would most probably have come from within Taman Negara. More than 80 km of roads to the damsite and within Taman Negara would have had to be constructed and heavily used during the construction period. The availability of large tracts of commercially valuable timber in the area would have resulted in many more kilometres of logging road. The damage would have enhanced soil erosion and flooding and rendered the habitat unsuitable for a great variety of forest dwelling animals in areas far greater than the damsite itself.

The human impact would have been just as devastating for it would have affected the wealth of folktales, legends, folk beliefs and medicines, folk songs, devices and games, traditional handicrafts and technologies found in the area. It would also have resulted in the displacement of several Malay and Orang Asli villages – in all an estimated 8,000 people.

These adverse effects galvanised non-governmental organisations who joined efforts by forming a Tembeling Co-ordinating Committee to wage a co-ordinated nationwide campaign against the proposed dam. The campaigns included the sale of postcards, T-shirts, printed articles in the press, a signature campaign and seminars on the controversial subject. The campaign lasted throughout 1982 until the government announced the shelving of the Tembeling project on January 16, 1983 saying that ecological considerations had been among the factors influencing the decision.

The Bakun Hydro-Electric Project

The bulk of Malaysia's hydropower is located in Sarawak (69 percent) with 17 percent in Sabah and the remaining 14 percent in Peninsular Malaysia (Ministry of Science, Technology and the Environment, 1998, 16). Studies to utilise the hydropower of the Sarawak rivers began in the 1970s and continued intermittently through the 1980s. The Rajang River was the focus of a study begun in 1980. That study identified four possible dam sites – Bakun (2,400 MW), Murum (900 MW), Pelagus (770 MW) and Baleh (900 MW). These projected capacities were far in excess of Sarawak's own needs and hence the proposal to lay a 650 kilometre undersea cable to cross the South China Sea and carry part of the electricity to Peninsular Malaysia.

Bakun was finally the chosen site. It was originally proposed to be built in the 1980s. But the huge cost, the recession of the mid-1980s and local protests led to an announcement by the Government that the project would not be undertaken. The Prime Minister, Dr. Mahathir Mohamed was quoted as claiming that the scrapping of the project was proof of

Malaysia's commitment to the environment (New Straits Times, June 13,1990). However, in September 1993, the Federal Cabinet announced that the Bakun Dam Project would be resurrected. In January 1994, a Memorandum of Understanding (MOU) was signed which awarded the major contract for the dam to Ekran Bhd without any tender process. According to Ekran's 1995 annual report, Ekran Bhd was led by Sarawak timber and property tycoon Ting Pek King with a 21.11 percent stake and his wife with a 5.19 percent stake. Much of the rest of Ekran's shares were held by nominee companies, meaning that it is impossible to identify who actually holds the shares. Insan (1996) suggests that the company is closely connected to senior politicians in the Federal Government and the Sarawak State Government who would reap monetary benefit from Bakun's spin-offs.

The Bakun HEP, billed as the biggest hydroelectric power dam in Southeast Asia, is located 37 km upstream of Belaga, on the Balui River. The reservoir built with a dam of 205 metres in height, billed as the highest in the world, would flood 69,640 hectares of forest. The supporting infrastructure will make further inroads into the forest – an airport, 125 km road from Bintulu to the dam site, hostels and hotels, and a 10,000 hectares industrial park. The usage prior to this was secondary forest (45.5 percent), shifting cultivation (15.6 percent) and already logged land (36.9 percent). The whole of the land would no doubt, be logged to exhaustion prior to the dam's flooding. Fifteen longhouses from the Kayan, Kenyah, Kajang, Ukit and Penan tribal communities would be displaced – in all 8, 188 people according to Ekran's 1995 EIA report. In March 1995, the first of four EIAs was approved and work started on site-clearance, office construction, clearing of the land for the airport, reservoir and tunnel construction. The affected communities and public interest NGOs mounted a campaign against it and Sahabat Alam Malaysia sponsored an action in the courts by three of the affected natives. The project continued nonetheless. The economic crisis led the government to defer the project in October 1997 but by then the land had been logged and the affected communities relocated.

4. Conflicts Involving the Indigenous People of the Forest

The forest is not only the home of flora and fauna but also of humans – it is occupied by indigenous communities who have evolved a rich and dynamic adat (custom) that orders their relationship with fellow men and the environment. Adat is an all-pervading system also involving legal rules and principles, which ensured access to land and forest to all members of the community. This traditional system is fast disintegrating from the impact of new laws and the process of development imposed by the State and larger society. There has been a steady encroachment upon land rights and utilisation of these indigenous populations, who rely on the forest for their sustenance and life. Even rights initially recognised by the state as inviolate can, and have, been extinguished by changes to the law or by administrative fiat. Powerful forces conspire to rob these people of their land and forest – for agricultural settlement, logging, dam construction and a host of other economic activities – not in their interest but that of the project proponents and "larger society". The resistance offered by these people and their lack of success in defending their rights are the most tragic conflicts that encroachment into forest land manifests.

In Peninsular Malaysia the most vulnerable are the Orang Asli communities. 'Orang Asli' is a generic term for three tribal groups – the Negritoes, the Senois and the Proto-Malays. Each of these

three tribal groups is further divided into 18 sub-groups based on ethno-linguistic criteria. As of July 1, 1991 there were a total of 85,453 Orang Asli in 778 settlements spread over 47 districts in 9 states of the Peninsular (Jimin, 1992, 10).

The Malaysian Constitution confers special privileges and protection on all indigenous peoples of the country but denies this to the Orang Asli. Hence, unlike the Malays and the natives of Sabah and Sarawak (Article 153 and 161A) the Orang Asli do not enjoy any clearly defined and obligatory provision of special privileges and protection. However, a federal government intent on providing special benefits to the Orang Asli may introduce positive discrimination "for the protection, well being or advancement of the aboriginal peoples of the Malay Peninsular (including the reservation of land) or the reservation to the aborigines of a reasonable proportion of suitable positions in the public service (Malaysian Constitution, Article 8(5)(c)). This is an enabling provision the exercise of which has not been ruled upon by the Courts as mandatory. It is a power that the Federal Government has yet to utilise to the benefit of the Orang Asli (Rachagan, 1990).

The Aboriginal Peoples Act 1954 (Revised, 1974) empowers the states to declare (and revoke) aboriginal areas and reserves and for this purpose to even compulsorily acquire non-state land. The states have not been active in this aspect and this despite the recommendations of the Jabatan Orang Asli (JOA), a federal government department established to provide for these marginalised and disadvantaged people. Gomes (1990:24) citing the New Straits Times of January 16, 1983 notes:

> In the State of Perak, for instance, only 306 hectares have been gazetted as aboriginal reserve and another 17,325 hectares have been approved but yet to be gazetted while application for 25,000 hectares by the JOA to the state government is still awaiting a decision. It seems some applications were made as long as 25 years ago.

This remains the situation in most of the nine states in which the Orang Asli reside.

In Sarawak the pressure is on sections of the Dayak peoples. The term Dayak peoples refers to a broad ethnic grouping which in 1991 numbered 810,149 and comprised some 49.35% of Sarawak's population. They included Iban (29.45%), Bidayuh (8.28%), Melanau (5.71%), Kenyah (1.25%), Kayan (1.23%), Murut (0.79%) and other smaller groups (Department of Statistics Malaysia, 1995, 79-83). Most of the Dayak communities practice shifting cultivation. Land and forest is their livelihood and their most cherished traditions and spiritual beliefs are centred on their relationships to the land. Apart from the agriculturists there are the forest people who depend to a large extent on hunting and gathering activities for their livelihood. These groups include the Penan (9434), Ukit, Bukitan (Baketan) and Sian (Sihan) peoples. To them the forest is the only home (Hong, 1987). Rob them of their forest and they perish.

The Sarawak Land Code (Cap 81) (Revised Law of Sarawak 1958), which with amendments is the main legislation determining land tenure and administration in the state provides for native area land, native customary land and three other categories of land use - mixed zone, reserved, and interior area land. The Land Code and subsequent amendments provide little protection of customary rights. The state authority is empowered to declare lands as native area land and native customary land. It has also several clauses that enable the government to remove or extinguish these rights.

Logging, dam construction and road building encroach into the lands of the Dayak people and their system has come under thread by various laws and policies. Their fight to protect their rights has been ably chronicled by several writers (Hong, 1987; Sahabat Alam Malaysia (1989), Chen, 1990; Cleary and Eaton, 1992; Sutlive, 1992). The natives have organised themselves to expose their plight and on occasions resorted to direct action. In this they have been assisted by a number of Malaysian non-governmental organisations. Unfortunately, law and the coercive authority of the state backs those who would encroach on the land and forests of these people.

The Forests (Amendment) Ordinance 1987 of Sarawak is an example of this. In 1987 after repeated requests to the government for a cessation of logging in their land the Penans blockaded timber concession areas and prevented the movement of logs, labour and supplies. Kayan, Kenyah and Kelabit groups also set up their own barricades. The operations of nine major timber companies were drastically affected. When the Courts decided that the barricades built on their own land were

not breaking the law, the state government brought an amendment to the forestry law (Cleary and Eaton, 1992:186-7). The amendment stated:

> "Any person who
>
> (a) lays, erects or sets up or causes to be laid, erected or set up any structure, stone, log, tree or any other article on any road constructed or maintained by the holder of a license or permit issued under this Ordinance so as to cause a barrier or obstruction to the passage of that road; or
>
> (b) wilfully prevents, obstructs or molests any forest officer or police officer in the execution of his duties or the holder of a license or permit or his employee or agent from removing the barrier or obstruction or in the exercise of his rights within the area covered by the license or permit;
>
> shall be guilty of an offence: Penalty, imprisonment for two years and a fine of six thousand dollars…"

(Forests (Amendment) Ordinance, 1987)

E. CONFLICT RESOLUTION MECHANISMS

The diminishing forests and their resources are disputed over by a variety of interests. More significant amongst these are:

- The indigenous communities which have from time immemorial occupied these forests but whose claims have been made tenous by land and forest laws;
- Individuals and corporations who have obtained permits from the state to extract forest produce or convert the forest to other uses;
- Individuals and non-governmental organisations which represent the interests of disadvantaged minorities and the collective interests of society for conservation and sustainable development;
- The governments of the 13 states of the Malaysian federation who have jurisdiction over the forests and their resources, and their agencies and
- The federal government and its agencies.

Conflicts occur amongst and between individuals, organisations and agencies within each of these interest groups. Indigenous communities rely on the rules of adat to resolve disputes amongst its members. Conflicts between the federal government and the states has been resolved at the level of the National Land Council, the National Forestry Council and by negotiation between federal and state leaders. The principal factors that have contributed to state leaders being generally compliant to the dictates of the federal government leaders are reliance on the federal government for extra – constitutional grants to their states and membership in the same political party. The need to rely on the courts has arisen only when there has been a different political party in power at the state level from that at the federal level. The dispute between the Federal Government and the Government of the State of Kelantan cited earlier is an instance of such. The Constitution provides that the Federal Court, to the exclusion of any other court, shall have the jurisdiction to determine disputes as between the federation and the states (Article 128(1)).

Conflicts between the state and the interests granted permits to extract forest produce or convert parts of the forest to other uses on the one hand, and the indigenous communities and NGOs, which have disputed such changes in land use on the other hand, have occurred with increasing frequency over the years. Two conflict resolution mechanisms have been relied on to resolve these disputes – the courts and the EIA system which is now a statutory obligation for project proponents in forest areas.

The Malaysian courts have shown a willingness to grant access to the judicial system for indigenous communities who have claims over forests. The problem however, is one of establishing

their claim – an invidious task for communities that lack land titles, mapped territories or documentation. Rules as to procedure and evidence are particularly problematic to these groups as is the denial of class action suits. A useful development occurred in the High Court of Borneo in the case of *Jok Jau Evong v Marabong Lumber Sdn Bhd* ([1990] 2 CLJ 625). That case is of special importance to the issue of incursions by logging interests into native land in Sarawak. The plaintiffs were three members of the Kayan community in a remote Sarawak kampong. The Kayan had been granted native land rights over an area of protected forest by the colonial government by a proclamation under the Forests Ordinance. In 1987, they found their land being logged by a timber company under a licence granted by the state government. They sought various declarations and injunctions in a representative action brought on behalf of the Kayan community though about half the community disagreed with the proceedings. The High Court held that the plaintiffs could bring a representative action. This in itself is a major victory for these communities since land is held collectively. But this proved pyric in the light of the judges other rulings.

The defendant had not pleaded the defence of limitation but the judge nonetheless allowed them to put the defence of limitation and then ruled that the Plaintiffs were time-barred: "If the plaintiffs sleep on their rights then they take the risks that their rights may be extinguished". The judge could have ruled that the limitation period should run from when the plaintiffs were aware of the facts which would have led them to believe that their rights were being denied and of their right to take action to protect them. That would have permitted the courts to determine the issue on the merits of the case. Instead the judge chose to adopt a highly restrictive view. It is unfortunate that members of these communities are expected to peruse each Gazette notification to ensure that their rights are not removed by administrative fiat and surrendered by the State Government to logging interests.

Of great significance to the rights of indigenous peoples to their land is the High Court (Johor Bahru) decision in *Adong bin Kuwau & Ors v Kerajaan Johor & Anor* ([1997] 1 MLJ 418-436). The case involved 52 plaintiffs who were heads of aboriginal families living around the Sungai Linggiu catchment area near Kota Tinggi, Johor, which had been acquired by the Government of the State of Johor for the construction of the Sungai Linggiu Dam. The plaintiffs contended that the rights accorded to the aboriginal people by common law and statutory law were proprietary rights within the ambit of Article 13(1) of the Federal Constitution and that when these rights were taken away, they should be compensated pursuant to Article 13(2). His Lordship Mokhtar Sidin JCA held (at pp. 429-430; 436 of the judgment):

> The British introduced the Torrens land system, which introduced alienation and title for the first time. This system brought within it all the people except the aborigines who continued to live in the jungle and roamed freely and sheltered wherever they wanted… Before the introduction of the Torrens land system, these lands were unclaimed land in the present sense but were "kawasan saka" to the aboriginal people. On the introduction of the Torrens land system, all the kawasan saka became state land but the aboriginal people were given the freedom to roam about these lands and harvest the fruits of the jungle. Some of these lands have been gazetted as forest reserves. The plaintiffs, however, continue to live and/or depend upon this unalienated land… My view is that … the aboriginal peoples' rights over the land include the right to move freely about their land, without any form of disturbance or interference and also to live from the produce of the land itself, but not to the land itself in the modern sense that the aborigines can concey, lease out, rent out the land or any produce therein since they have been in continuous and unbroken occupation and/or enjoyment of the rights of the land from time immemorial. I believe this is a common law right … the plaintiffs had suffered deprivation of the following types of interest in the land:
>
> (1) deprivation of heritage land;
> (2) deprivation of freedom of inhabitation or movement under art 9(2);
> (3) deprivation of produce of the forest;
> (4) deprivation of future living for himself and his immediate family; and
> (5) deprivation of future living for his descendants.

> … On calculation the total loss of income of the aborigines is RM26.5 m … and order that the defendants pay the plaintiffs the sum of RM26.5 m."

It is very significant that the forested land in question had not been declared an aboriginal area or aboriginal inhabited place under the provisions of the Aboriginal Peoples Act 1954. This was one of the grounds relied on for an appeal by the Government of Johor. The Court of Appeal, however, dismissed the appeal and held in the unreported decision of *Kerajaan Negeri Johor, Pengarah Tanah dan Galian Johor dan Adong bin Kuwau dan 51 Orang Lagi (Government of Johor v Adong b Kuwau)*: Civil Appeal No. 24-828-94 High Court of Malaya at Johor Bahru:

> "… the respondents' case is not based upon a claim that the land in question was an aboriginal area. They rely upon the absence of anything in the Act that excludes their common law rights to derive their livelihood from land which is an "aboriginal inhabited place". Herein lies the fallacy in the appellants argument".

If this decision is upheld by the Federal Court, the indigenous peoples' rights to their land will be safeguarded.

A major problem faced by public interest groups and other NGOs attempting to protect collective interest is the rules of standing. The Malaysian Supreme Court has ruled that where a statute created a criminal offence but no civil remedy, the Attorney-General is the guardian of the public interest and it is he alone who could enforce compliance with the law. No other person can, without the consent of the Attorney-General, bring an action for an injunction in aid of enforcement of the criminal law unless some private right of his was being interfered with, or he suffered special damage peculiar to himself (*Government of Malaysia v Lim Kit Siang* [1988] 1 MLJ 50, [1988] 2 MLJ 12). Public interest groups are thereby denied standing. They have therefore to find qualified individuals willing to lend their name for a test case. Sahabat Alam Malaysia and the Consumers Association of Malaysia have been particularly active in this area. The litigation that focussed on the Bakun Hydro-Electric Dam is an instance of such an action. It is dealt with in greater detail below.

The EIA Rules introduced by the new s. 34A of the EQA 1974 provide a means of avoiding disputes related to developments of the forest. An important part of the EIA is public participation from the early stages of the EIA preparation, and at the stage of the studies' review.

The EIA Handbook issued by the DOE provides that a valid assessment cannot be made without public participation which is seen as an aid to project planning in the following manner:

> (1) Monitor community needs and ensure that the direction or emphasis of the project continues to satisfy those needs.
> (2) Identify both material and psychological impacts of the projects on the community.
> (3) Measure and promote social acceptance of the project in the community and avoid costly modifications or abandonment of the project at a later stage.
> (4) Monitor changing environmental values in the community.
> (5) Obtain additional environmental information known to the local population (Department of Environment, 1995, 6).

The Handbook recommends public opinion sampling, public meetings or workshops and regular meetings with a Citizens Committee (p. 24). The Handbook further provides that Detailed Assessment reports should be in the form that can be made available to the public and makes it the responsibility of the project initiator to provide and distribute sufficient copies to meet the requirements of, *inter alia*, concerned environment related agencies and the interested public (para 3.4.7). The public are invited to comment on the proposed project which has been subjected to Detailed Assessment, unless it is against public interest (para 4.5). The Review Panel which reviews the EIA report in formulating its recommendations to the approving authority, will take into account the written comments received from the public and append these to the Detailed Assessment Review. Those which have been subjected to public scrutiny and subsequently approved for implementation by an approving authority will be held openly by the Review Panel

and may be inspected by the public. The provisions of the Guidelines are mandatory and an EIA Report may not be approved if there is non-compliance with the guidelines.

The Federal EIA laws applied throughout the Federation until 1 September 1994. Effective that date, they do not so apply in Sarawak State for a range of activities now governed by the Sarawak EIA Order 1994. The Federal Government concurred by gazetting the EIA Amendment Order 1995 which with retrospective effect "disprescribed" from the ambit of the section 34A of the EQA 1974 those activities governed by the Sarawak EIA Order 1994. Under the Sarawak provisions public participation is not mandatory – it is a privilege accorded by the project proponent and that only at the Detailed EIA stage. The Sarawak EIA Handbook provides that public participation "on the initiative of the project proponent and where it affects public interest" ought to be included in the Detailed EIA process "if it is likely to benefit the planning of the project …" (Sarawak Natural Resources and Environment Board, 1995, 19). This denial of public participation in the EIA process for activities governed by the Sarawak Enactment was the subject of litigation in the Bakun case. (*Kajing Tubek and Ors v Ekran Bhd and Ors* [1996] 2 MLJ 388).

The case involved three native residents of longhouse communities who would be dislocated by the Bakun HEP. They sought a declaration that before Ekran Bhd, the contractors for the dam, carried out the construction of the Bakun HEP, they had to comply with the EQA 1974, the guidelines prescribed under section 34A of the Act, and the regulations made thereunder. They contended that the approval of the Bakun HEP EIA Report under the provisions of the Sarawak Natural Resources and Environment (Prescribed Activities) Order 1994 (the Sarawak EIA Order) was a breach of natural justice and/or impinging on their right to be heard. They further contended that they had been conferred the right to comment on the Bakun EIA Report by the EQA 1974, a right that subsisted when the Bakun HEP project was revived by the Cabinet. The EIA Amendment Order 1995 had sought with retrospective effect to "disprescribe" from the ambit of section 34A those activities covered by the Sarawak EIA Order and this affected their vested/accrued rights.

The learned trial judge granted the plaintiffs a declaration that the EIA Amendment Order 1995 is invalid and that Ekran Bhd had to comply with the EQA 1974. The judge also considered the usefulness of ordering Ekran Bhd to comply with section 34A of the EQA. The judge said that "the most notorious" difference between the federal EIA process and that required by the Sarawak legislation is the right of the public to a copy of the EIA report and the right to be heard and make representation before the approval of the EIA is granted:

> "This difference may change the whole course of things as input through public participation as provided by the Guidelines may cause the approving authorities under the EQA to take an entirely different cause of action, or to impose certain conditions that may be beneficial to the project and the public as a whole … it is relevant, and indeed mandatory for the authorities to hear the views of the public first … It makes a mockery of the whole issue to say that the EIA can be approved first and if the public has any constructive ideas, they can submit later. This certainly is illogical, deprived of good sense and sound reasoning…"([1996] 2 MLJ 408).

The Court of Appeal, however, held that the EQA 1974 did not apply to the Bakun HEP because of the division of powers between the federation and the states provided for in the Ninth Schedule to the Constitution. Though Parliament and the Legislative Assembly of the State of Sarawak have concurrent power to make law regulating the production, supply and distribution of power, the power to be generated is in land and water and the powers to legislate on land and water is wholly within the State of Sarawak. The Sarawak EIA Order was therefore valid and applicable (*Ketua Pengarah Jabatan Alam Sekitar and Anor v Kajing Tubek and Ors and Other Appeals* [1997] 3 MLJ 13).

F. CONCLUSION

Developing countries have to utilize their resources if they want to develop at all and changes in land use and landscape are inevitable. Large tracts of forested land will have to be exercised for agriculture, timber extraction, dam construction, mining, industry and other activities. Despite the argument presented for the preservation of forests for their protective, recreational and aesthetic

functions their economic function need also be considered. However, for long the economic lobby has been so influential that its demands have often caused the long term viability of the forests to be sacrificed for immediate short term financial gains. A balanced and pragmatic policy needs to be formulated and enforced to manage the forests such that all interests can be satisfied without irreparable damage to the land.

Malaysian leaders at the federal level, have shown a willingness to devise such a policy and consider the issues raised by ecologists. The unfortunate circumstances attendant on the Bakun Hydro-Electric Project are a sad exception to this. If the state governments also pay serious attention to ecological considerations the Malaysian forest resources will be conserved and harnessed to satisfy the needs of generations to come.

The indigenous communities that are dependent on the forest and have from time immemorial had a claim to it have to be treated equitably. Their legitimate interests will have to be assessed, clearly demarcated and guaranteed. The states have failed to do so. This is a task that the federal government will now have to treat as a matter of priority. The National Land Council and the National Forestry Council can help make this a reality.

Public participation in the EIA process helps minimise conflicts from proposed changes to forest land use. The Sarawak EIA Order denies this as of right. This shortcoming needs to be urgently addressed.

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Appendix I

Activities which impact on Forest for which EIA is required

1. Agriculture

(a) Land development schemes covering an area of 500 hectares or more to bring forest land into agricultural production.
(b) Agricultural programmes necessitating the resettlement of 100 families or more.
(c) Development of agricultural estates covering an area of 500 hectares or more involving changes in types of agricultural use.

2. Airport

(a) Construction of airports (having an airstrip of 2,500 metres or longer)
(b) Airstrip development in state and national parks

3. Drainage and Irrigation

(a) Construction of dams and man-made lakes and artificial enlargement of lakes with surface area of 200 hectares or more.
(b) Drainage of wet land, wild-life habitat or of virgin forest covering an area of 100 hectares or more.
(c) Irrigation schemes covering an area of 5,000 hectares or more.

4. Forestry

(a) Conversion of hill land to other land use covering an area of 50 hectares or more.
(b) Logging or conversion of forest land to other land use within the catchment area of reservoirs used for municipal water supply, irrigation or hydro-power generation or in areas adjacent to state and national parks and national marine parks.
(c) Logging covering an area of 500 hectares or more.
(d) Conversion of mangrove swamps for industrial, housing or agriculture use covering an area of 50 hectares or more.
(e) Clearing of mangrove swamps on islands adjacent to national marine parks.

5. Infrastructure

(a) Construction of hospitals with outfall into beachfronts used for recreational purposes.
(b) Construction of expressways.
(c) Construction of national highways.
(d) Construction of new townships.

6. **Resort and Recreational Development**

(a) Construction of coastal resort facilities or hotels with more than 80 rooms.
(b) Hill station resort or hotel development covering an area of 50 hectares or more.
(c) Development of tourist or recreational facilities in national parks.
(d) Development of tourist or recreational facilities on islands in surrounding waters which are gazetted as national marine parks.

7. **Water Supply**

(a) Construction of dams or impounding reservoirs with a surface are of 200 hectares or more.

(b) Groundwater development for industrial, agricultural or urban water supply of greater than 4,500 cubic metres per day.

Appendix 2

Protected Areas in Malaysia

Protected Areas in Peninsular Malaysia, 1903-1996
(Excludes Virgin Jungle Reserves and Protection Forests)

PROTECTED AREA	STATE	YEAR ESTABLISHED	AREA (ha)
Colonial Period (1903-57)			
Chior GR [@]	Perak	1903	4,330
Bukit Nanas WS[@]	Selangor	1906	9
Bukit Kutu WR[@]	Selangor	1922	1,943
Fraser's Hill BS[a@]	Selangor	1922	2,979
Kuala Selangor (Bukit Melawati) WR	Selangor	1922	44
Krau WR	Pahang	1923	53,095
Kuala Lumpur Golf Course WR	Selangor (now Federal Territory)	1923	40
Serting GR[+]	N. Sembilan	1923	327,576
Gunung Tahan GR[b]	Pahang	1925	143,345
Sungai Lui GR[+]	Pahang	1925	17,200
Port Dickson Island WR	N. Sembilan	1926	0.5
Sungkai WR	Perak	1928	2,428
Sg. Bukit Putih WR[@]	Selangor	1932	40
Endau-Kluang WR[@]	Johor	1933	101,174
Endau-Kota Tinggi (West) WR[@]	Johor	1933	61,959
Endau-Kota Tinggi (East) WR[@]	Johor	1933	7,413
Klang Gates WR[@]	Selangor	1936	130
Segamat WS	Johor	1937	31,079
Taman Negara NP	a) Pahang[e]	1939	248,227
	b) Terengganu[e]	1939	80,289
	c) Kelantan[e]	1939	106,235
Bukit Gajah BR	Perak	1952	4.5
Pahang Tua BS	Pahang	1954	1,336
Four Islands BR	Johor	1954	5
Templer Park[#]	Selangor	1956	1,011
National Period (1957-96)			
Cameron Highlands WS[@]	Pahang	1962	64,953
Sg. Dusun WR	Selangor	1964	4,330
Pulau Tioman WR	Pahang	1972	7,160
Kuala Selangor NaP[c*]	Selangor	1989	240
Endau Rompin NP[d]	Johor	1993	48,905

Source: Adapted from Aiken, R. (1994)

Notes:

@ Overlap either wholly or partly with forest reserve area.

a A small adjoining area (information on size not available) in Pahang was added in 1957.

+ Protected areas revoked in 1929.

b Subsequently incorporated into the Taman Negara NP in Pahang. This means an additional 104.822 ha. included to make up the total 248,227 ha. of Taman Negara in Pahang in 1939.

degazetted from a Park for wildlife and redesignated as an Amenity Forest within the Hulu Gombak Forest Reserve in 1996.

c Managed as a Nature Park (although not formally gazetted by law as such) since 1989 by the District Council with assistance from the Malaysian Nature Society.

- Overlap with Town Board/District Council area.

d Created under the National Parks (Johor) Corporation Enactment 1991 as a state park (not a national park). As the entire Endau Rompin NP is within the Endau-Kluang WR, there is no increase in the overall protected area size for Johor.

e area extended in 1995 for all three sectors of Taman Negara.

Appendix 2 (contd)

Gazetted Protected Areas in Sabah, 1963-1996

PROTECTED AREA	YEAR ESTABLISHED	AREA (ha)
PARKS		
Crocker Range	1984	139,919
Kinabalu Park	1964	73,370
Tunku Abdul Rahman Park	1974	1,289 # / 3,640*
Turtle Islands Park	1977	15 # / 1,725*
Pulau Tiga State Park	1978	607 # / 15,527*
Tawau Hills Park	1979	27,972
CONSERVATION AREAS		
Maliau Basin (Gunung Lotung)	1983	39,000
WILDLIFE RESERVES		
Kulamba	1984	20,682
Tabin	1984	120,521
TOTAL	-	**443,997**

Note:

\# area on land

• area of marine waters

Gazetted Protected Areas in Sarawak, 1963-1996

PROTECTED AREA	YEAR ESTABLISHED	AREA (ha)
NATIONAL PARKS		
Bako	1957	2,728
Gunung Mulua	1974	52,866
Niah	1975	3,140
Lambir Hills	1973	6,952
Similajau	1976	7,067
Gunung Gading	1982	4,196
Kubah	1989	2,230
Batang Ai	1991	24,040
Loagan Bunut	1991	10,736
Tanjung Datu	1994	1,379
WILDLIFE SANCTUARIES		
Samunsam	1979	6,092
Lanjak-Entimau	1980	168,758
Pulau Tukong Ara-Banun	1985	1.4
TOTAL		290,185.4

Source: Ministry of Science, Technology and the Environment, 1997:57-58