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GLOSSARY

EIA	Environmental Impact Assessment
IPPA	Identification of Potential Protected Areas
MOCET	Ministry of Culture Environment and Tourism
MTED	Ministry of Tourism and Environmental Development
RM	Ringgit Malaysia
SBCP	Sabah Biodiversity Conservation Project

EXECUTIVE SUMMARY

GENERAL

The Identification of Potential Protected Areas (IPPA) component of the Sabah Biodiversity Conservation Project (SBCP) investigated several geographical zones and habitats considered to be inadequately represented or not present within Sabah's Protected Area system.

Sugut Commercial Forest Reserve (32,007 hectares) is bisected by a corridor, about 1.5 kilometres wide, of unprotected riverine forest along the Lower Sugut River, Labuk-Sugut District.

This report: (a) makes recommendations concerning conservation of natural biodiversity in the Lower Sugut area and (b) seeks to ensure that recommendations for biodiversity conservation serve to maintain the potential for diverse economic development opportunities for existing resident communities.

The IPPA area of investigation was the Lower Sugut area in general, with special emphasis on the zone between the Sugut riverside villages of Kg. Pantai Buring and Kg. Kaliaga (see map). Studies were conducted on botany, fisheries, views of village residents and economic valuation of natural resources.

A recent Environmental Impact Assessment (EIA) of a proposed oil palm plantation development project in Lower Sugut, commissioned by PAMOL-Pelangi Jadi (1998), was consulted and found to contain a wealth of data and recommendations relevant to biodiversity conservation.

A workshop was held in Kampung Pantai Buring on 20 August 1998 to present results of the IPPA studies to the village residents and seek feedback on a proposal to retain a forest corridor along the Sugut River.

BIODIVERSITY

The Lower Sugut area contains six main natural forest types: Logged mixed dipterocarp forest, Kapur forest, Kerangas (= heath) forest, Flood plain forest, Perupok swamp forest and Riparian vegetation. These forest types are contiguous with one another and with extensive mangrove forests to the east of the study area.

Overall, one of the most important features of Lower Sugut in relation to biodiversity is the diversity of forest types within a relatively small area.

Rare and possibly endangered plant species recorded in the flood plain forests of Lower Sugut include *Ficus albipila* (a very large tree fig, known from a few lowland sites in Borneo and

probably extinct in Peninsular Malaysia) and *Arenga retroflorescence* (a palm known only from Lower Sugut, Lower Kinabatangan and swamp forest in Sepilok Forest Reserve).

The 1998 EIA of Lower Sugut lists 365 butterfly species, 57 amphibian species, 103 reptile species, 168 mammal species and 335 bird species in Lower Sugut. The presence of a small breeding population of orang-utans in Lower Sugut is significant, as this species is now seriously threatened with extinction due to loss and degradation of forests in many parts of the former range of this species throughout Borneo.

The freshwater fish fauna of Lower Sugut appears to be less rich than in Lower Kinabatangan in terms of species number, but fish are more abundant in Lower Sugut. It has been estimated that fishing contributes 71% of the total value of household income for Kg. Pantai Buring and Kg. Kaliaga.

LOCAL COMMUNITY ISSUES

The traditional economy of Lower Sugut, like other eastern Sabah Orang Sungai communities, is based on swidden rice farming on riverside terraces, fishing and harvesting of forest products. In the past, villages moved up and down the Sugut River, thereby allowing forest to regenerate naturally.

There are now two officially recognised villages in the area investigated: Pantai Buring (about 465 inhabitants, dating from 1972) and Kaliaga (about 107 residents, dating from 1983). Pantai Buring consists of three adjacent villages (Kumbatang, Ipil and Sangbad) with one government-appointed leadership.

Major concerns of the residents of the Lower Sugut communities include: lack of security over land tenure; disappearance of forest resources from repeated timber extraction and fire; the power of commercial timber interests; the rapid spread of large oil palm plantations; unpredictable loss of crops and resources from drought, fire and floods; isolation from health facilities, educational opportunities and markets.

ECONOMIC VALUATION OF NATURAL RESOURCES

Average size of swidden rice fields is about 2 acres per family, with a fallow period of 3 - 5 years. Yields of husked rice are normally between 350-500 kilograms/acre (but declined to about 200 kg/acre in the 1997-98 season due to drought).

Fishing provides another major part of food consumption and, on average, several hundreds of ringgit per year per family in income.

The existing natural ecosystem of Lower Sugut provides economic benefits to village residents, conservatively valued at RM5,645 per household per year, or RM287,900 in total.

Forest fire in 1998 has had a devastating impact on Lower Sugut.

BENEFITS OF A RIVERINE CONSERVATION AREA

There are at least three kinds of biodiversity conservation benefits from retention of a forest corridor between the two sections of Sugut Commercial Forest Reserve: preservation of the full original variety of forest types of Lower Sugut; facilitation of regeneration of logged and burned forest by allowing movements of natural seed dispersers; and sustenance of aquatic quality and biodiversity.

Retention of a forest corridor between the two sections of Sugut Commercial Forest Reserve can help to support the economy of Kg. Kaliaga and Kg. Pantai Buring by: protecting freshwater fisheries; allowing harvesting of forest produce; and maintaining the option for a diverse local economy.

The only negative impact of retaining a forest corridor would be to forgo development of oil palm in the area retained.

THREATS TO BIODIVERSITY CONSERVATION

Threats to conservation of biodiversity in the Lower Sugut area include: forest fires; development of large scale oil palm plantations; timber extraction done not in accordance with a long-term forest management plan; unclear land policy and land alienation to non-residents, who have no interest in maintenance of forest and aquatic resources.

LOCAL DEVELOPMENT

There are several key elements which would help to meet the needs and aspirations of local people while at the same time help to conserve biodiversity. These elements include: proper development of large plantations according to a predetermined land use plan or environmental impact assessment (EIA); land security for local residents; retention of selected areas of riverine forest for community use; allocation of selected “protection compartments” in both sections of Sugut Commercial Forest Reserve.

RECOMMENDATIONS

Communication and action

Copies of this report to be submitted for information and further action to all government agencies relevant to implementation of the recommendations.

A single coordinating agency (Department of Environmental Conservation) to take the lead to implement a “regional land use plan” for Lower Sugut, by ensuring, assisting and guiding implementation of all the recommendations in this report.

Implementing a regional land use plan by indirect means

(a) Approval and enforcement of existing EIA

Strong support is given for approval and enforcement of the EIA already prepared for PAMOL-Pelangi Jadi (1998) for a proposed 20,000 hectare oil palm plantation in the Labuk-Sugut. This will require that directives be made to owners / developer's of all oil palm plantations within the coverage of this EIA.

(b) Establishment and management of riverine conservation areas under the Cultural Heritage (Conservation) Enactment

Two “riverine conservation areas” are proposed, totalling about 450 hectares (see map), to be retained as conservation areas under section 4(1) of the Cultural Heritage (Conservation) Enactment, 1997. These areas should be retained under natural forest cover. Local residents should be permitted to extract forest produce for their own and community use.

In order to pursue this recommendation, Department of Environmental Conservation, Sabah Wildlife Department and the Secretariat of the State Cultural Heritage Council should jointly hold dialogues with village residents in Lower Sugut, to explain and discuss the purposes of the proposed two “riverine conservation areas”. These agencies should record views expressed, along with an assessment of the overall response of the villages.

Based on this report and on feedback, a proposal will need to be prepared and submitted to the State Cultural Heritage Council for establishment of the Lower Sugut riverine conservation areas.

Management of the riverine conservation areas should be delegated to the Sabah Wildlife Department, which should inform local communities about the heritage conservation area designation, and liase and collaborate with them to (a) develop a management plan and (b) allow members of the community to play an active role in use and management of these areas.

Land owners and land applicants affected by the heritage conservation area designation should be informed.

(c) Protection compartments in Sugut Commercial Forest Reserve

It is recommended that three protection compartments are zoned in the management plans for Sugut Commercial Forest Reserve. The proposed protection compartments (see map) are : (a) Wansayon compartment (about 180 hectares); (b) Merah compartment (about 600 hectares); and (c) Kumbawon compartment (about 640 hectares).

Exclusion of commercial logging from these compartments will afford protection to examples of all the natural forest types, and ensure that these forests remain contiguous with the coastal mangroves.

(d) New regional EIA

It is assumed that proposals and plans exist to convert much of the Sugut region to extensive oil palm plantations. Based on this assumption, a regional EIA should be prepared, covering all land other than Forest Reserves, village land and land not covered in the PAMOL (1998) EIA. This new regional EIA can be achieved by requiring a joint effort by the various companies intending to develop plantations in this region. The PAMOL (1998) EIA can serve as a model. The regional EIA will need to be evaluated and approved for implementation. This may be done under the provisions of the Conservation of Environment Enactment.

Monitoring of trends in village land use

As the process of determining the long-term pattern of land tenure and land use in Lower Sugut develops, there are likely to be changes in the socio-economy of local community residents. Trends of change in village and small-holder land use should be monitored, and steps taken, if necessary, to ensure maintenance of good water quality.

Secure land tenure for local native residents

Equitable allocation of land and security of land tenure should be provided to the native residents of Lower Sugut so that they can better plan for their future. It is recommended that processing of existing land applications in the area surrounding and between Kg. Pantai Buring and Kg. Kaliaga be frozen, pending implementation of a process to ensure appropriate allocation of land and land titles.

1. BACKGROUND

Extensive conservation areas of natural forest habitat are normally much superior to small conservation areas, because large areas can sustain breeding populations of more species.

One way to enhance Sabah's potential to conserve biodiversity is to seek areas where retaining a small area of forest land will serve to link two existing, separate reserves. In this way, retaining a relatively small land area for conservation can have a disproportionately large positive impact. One such area exists in the Lower Sugut River area, Labuk-Sugut District, where Sugut Commercial Forest Reserve (32,007 hectares) is bisected by a corridor, about 1.5 kilometres wide, of unprotected riverine forest. Sabah Conservation Strategy (1992) recommended that this riverine zone be made a protected area, in order to increase the value of Sugut Commercial Forest Reserve and incorporate riverine forest and oxbow lakes within the reserved area.

In recent years, several trends have emerged which are relevant to the establishment of a riverine forest link between the two sections of Sugut Commercial Forest Reserve:

- (1) In general, all large wildlife species are coming under increasing pressures, nationwide, as a result of forest conversion to plantations, repeated logging of forest and hunting. For example, the small numbers of tembadau and rhinoceros reported to be present in the forests of Lower Sugut around 1980 (Davies & Payne, 1982) have since then died out (Payne, 1993).
- (2) The practice of clearing forests from riversides and in wetlands has contributed to declines in fisheries. The details of this decline have not been documented but the scale can be judged from Peninsular Malaysia, where some species of economically valuable fish have disappeared from river systems where forest has been converted to other land use (Mohsin & Ambak, 1983; Khan et al., 1996). In Sabah, Greer (1998) has shown that streams in the Crocker Range foothills where land use is predominantly forest (including heavily logged forest) maintain aquatic life, while streams in nearby oil palm plantations resemble urban drains and are biologically dead.
- (3) Applications have been received by the government to alienate almost all remaining State land throughout Sabah to private ownership for conversion of forest to alternative land use.
- (4) The price of palm oil has increased to the extent that the swampy, flood-prone land which was previously regarded as unsuitable for oil palm cultivation (such as that between the two sections of Sugut Commercial Forest Reserve), may be suitable and economically viable for this crop if a drainage and bund system is constructed.

2. OBJECTIVES

The objectives of this report are :

- (a) To make recommendations concerning conservation of natural biodiversity in the Lower Sugut area of Labuk-Sugut District.
- (b) To ensure that recommendations for biodiversity conservation serve to maintain the potential for diverse economic development opportunities for existing resident communities.

3. METHODS

Available biological studies (Davies & Payne, 1982; Payne, 1993) relating to the biodiversity of Lower Sugut were reviewed. A recent Environmental Impact Assessment (EIA) of a proposed oil palm plantation development project in Lower Sugut (PAMOL, 1998) was consulted.

Access to Lower Sugut for all IPPA field work was by boat, supplied by the Sabah Wildlife Department. A road access route was sought (after most field work was complete, in July 1998) but found to be impractical for purposes of reaching Lower Sugut.

IPPA field surveys were conducted of the natural riverside vegetation of Lower Sugut in July 1997 (Background Paper 1) and freshwater fisheries in April 1998 (Background Paper 2).

The IPPA area of investigation was the Lower Sugut area in general, with special emphasis on the zone between the Sugut riverside villages of Kg. Pantai Buring and Kg. Kaliaga (see map). IPPA field investigations concentrated attention on seeking the views and perceptions of these village residents in February-April 1998 (Background Paper 3) and household economic activities and livelihood patterns in June 1998 (Background Paper 4).

A preliminary visit to introduce representatives of SBCP (IPPA component biologist and anthropologist, with Wildlife Department staff) was made (4 - 12 February 1998). Further data collection for this report was carried out on a second visit by the same advisers (biologist and anthropologist, 25 March - 15 April 1998), with assistance from Wildlife Department. A third visit was made by the IPPA biologist and the tourism specialist of MTED, with the fisheries specialist (22-26 April 1998).

An aerial survey was conducted on 28 July 1998 to assess forest condition in Lower Sugut (Background Paper 5).

A workshop was held in Lower Sugut on 20 August 1998 to present results of the IPPA studies to the village residents and seek feedback on the forest corridor protection proposal (Background Paper 6).

4. RESULTS

4.1 PLANT LIFE

The Lower Sugut area contains several natural forest types (PAMOL, 1998; Background paper 1). The main forest types and their salient features are as follows:

Logged mixed dipterocarp forest - Mixed dipterocarp forest was originally the most widespread forest type of Lower Sugut, occurring on all non-swampy soils except whitish sandy soils and the elevated dip slopes of sandstone ridges. PAMOL (1998) recorded at least 160 tree species (including 31 dipterocarps, of which 12 are endemic to Borneo) and about 50 other plant species, including 20 palms.

Kapur forest - Kapur refers to all species of the genus *Dryobalanops*, a dipterocarp. Kapur merah (*Dryobalanops beccarii*) forest occurs on whitish sandy soils near the coast in the Lower Sugut area. Most of the large trees in this forest consist of one species (kapur merah) which contain numerous crevices and holes. The holes provide plentiful nesting sites for hornbills, which feed in other forest types (Payne, 1993; PAMOL, 1998). PAMOL (1998) recorded about 40 other tree species and only three plants other than trees in this forest type.

Kerangas (= heath) forest - This forest occurs on the dip (gentle) slopes of high sandstone ridges. The forest is short in stature, with few climbing plants, and relatively little animal life. PAMOL (1998) recorded 53 tree species, 8 palms and about 14 other plant species in this forest type (PAMOL, 1998).

Flood plain forest - PAMOL (1998) recorded 70 tree species in this forest type. The only consistent feature of this forest type is susceptibility to waterlogging and / or seasonal flooding. The forest is highly variable in plant species composition from site to site. For example, the PAMOL (1998) list of flood plain forest plants does not include any figs. Some parts of this forest, however, contain many figs (trees and strangling figs), especially *Ficus obypiramidata*, *F. microcarpa*, *F. involucrata* and *F. linneolykii* var. *coriaceae* (Background Paper 1). These fig-rich forests (see map) represent major food sources sustaining populations of hornbills and primates. Low-lying wet areas often have abundant *Mallotus muticus* trees. Rare and possibly endangered plant species recorded in the flood plain forests of Lower Sugut include *Ficus albipila* (a very large tree fig, known from a few lowland sites in Borneo and probably extinct in Peninsular Malaysia) and *Arenga retroflorescence* (a palm known only from Lower Sugut, Lower Kinabatangan and swamp forest in Sepilok Forest Reserve).

Perupok swamp forest - This is forest on peat, where the dominant tree is perupok (*Lophopetalum multinervum*). PAMOL (1998) recorded 57 other tree species and seven non-tree species within this forest type.

Riparian vegetation - This is the natural vegetation on the banks of rivers, oxbow lakes and streams (Background Paper 1). Common trees include *Nauclea subdita* (bongkol), *Octomeles sumatrana* (binuang), *Ficus racemosa* (tangkul) and *Colona serratifolia* (balik angin). Palms include *Daemonorops longipes* (rotan pipit), *Korthalsia jala* (rotan dahan), *Calamus praetermissus* (lansikan), *Licuala* species and *Oncosperma tigillarum* (nibong).

The above forest types are contiguous with one another and with extensive mangrove forests to the east of the study area.

Overall, one of the most important features of Lower Sugut in relation to biodiversity is the diversity of forest types within a relatively small area.

4.2 TERRESTRIAL ANIMAL LIFE

PAMOL (1998) lists 365 butterfly species, 57 amphibian species, 103 reptile species, 168 mammal species and 335 bird species in Lower Sugut.

Of rare and endangered species, rhinoceros and tembadau (wild cattle) are probably extinct, and any conservation area will now be insufficient to save these species in Lower Sugut. The forest within the south-eastern section of Sugut Commercial Forest Reserve contains a small population of orang-utans. Due to loss and degradation of forests in many parts of the former range of this species, coupled with fires in 1998 and pressures on remaining orang-utan habitat, the presence of a small breeding population in Lower Sugut is significant (Payne 1988).

4.3 FRESHWATER FISH

PAMOL (1998) recorded 73 fish species for Lower Sugut. Saini (Background Paper 2) found the freshwater fish fauna of Lower Sugut to be less rich than in Lower Kinabatangan in terms of species number, but fish are more abundant in Lower Sugut, judged from catch rate per unit effort. Forty-three species were caught during sampling in April 1998. Commercially-caught fish in Lower Sugut include *Osphronemus goramy* (kalui), *Oxyleotris marmoratus* (butiti), *Pangasius pangasius* (patin) and *Wallago maculatus* (tapah). It has been estimated that fishing contributes 71% of the total value of household income for Kg. Pantai Buring and Kg. Kaliaga, if natural products harvested and used are combined with money income (Background Paper 4).

4.4 LOCAL COMMUNITY ISSUES

Some significant results of this investigation (Background Paper 3) are:

- There are two officially recognised villages in the area investigated: Pantai Buring (about 465 inhabitants) and Kaliaga (about 107 residents). Pantai Buring consists of three adjacent villages (Kumbatang, Ipil and Sangbad) with one government-appointed leadership.

- Residents of Kg. Pantai Buring and Kaliaga are almost entirely Orang Sungai. About three-quarters are Muslim and the remainder either follow traditional religious practices or are Christian.
- About 52% of residents of Pantai Buring were born elsewhere and about 63% of residents of Kaliaga were born elsewhere; however, most of those from elsewhere migrated from other villages, mainly upstream, on the Sugut River.
- The traditional economy is based on swidden rice farming on riverside terraces, fishing and harvesting of forest products for own use and sale. In the past, villages moved up and down the Sugut River, as the swidden farming system involves clearing tall forest for farms, followed by long fallow periods. Some families continue this system, while most have settled in either Pantai Buring or Kaliaga. The present location of Kg. Pantai Buring dates from 1972 while Kg. Kaliaga dates from 1983.
- Traditionally, nearby forests were important sources of materials for boat building, freshwater prawn traps and housing. Due to repeated commercial timber extraction, the remaining forests near to the villages are now barely able to supply these products.
- Security of tenure over land is a major concern of local residents in general and, according to studies done for this report, the principle concern of most residents.
- Other key concerns of local residents are the absence of a hospital and a secondary school locally, loss of forest to excessive timber extraction, fire and plantations, and lack of markets for village crops and products.

Recommendations made by the IPPA anthropologist (Background Paper 3) include : retention of forest cover for local community use, resolution of claims for land titles, forwarding villagers' aspirations to government, discussion on a possible Native Reserve, and improvement of agricultural production.

4.5 ECONOMIC STUDY OF NATURAL RESOURCES

Some significant results of this investigation (Background Paper 4) are:

- Average size of swidden rice fields is about 2 acres per family, with a fallow period of 3 - 5 years (Note : this fallow period is short in comparison with traditional systems in most parts of Sabah, but not unusual for the fertile, moist alluvial terraces of large rivers). Yields of husked rice are normally between 350-500 kilograms/acre (but declined to about 200 kg/acre in the 1997-98 season due to drought).
- Fishing provides another major part of food consumption and, on average, several hundreds of ringgit per year per family in income (but money income from fish/prawn sales varies greatly between families, some earning nothing and others a significant part of annual income).

- The existing natural ecosystem of Lower Sugut provides economic benefits to village residents, conservatively valued at RM5,645 per household per year, or RM287,900 in total.

Recommendations made by the IPPA development specialist (Background Paper 4) include : communal rights to land for traditional farming and harvesting of forest produce; development of agroforestry and small-holder oil palm planting.

4.6 FOREST FIRE

Forest fire in 1998 has had a devastating impact on Lower Sugut. The bulk of the northern part of Sugut Commercial Forest Reserve burned. A large plume of smoke from fire in perupok forest was still visible during the village workshop on 20 August, more than two months after rain had broken the drought. At that time, forest in the southern parts of Sugut Commercial Forest Reserve was still in good condition (both north and south of the Sugut River).

5. DISCUSSION

5.1 IMPORTANCE OF LOWER SUGUT

Despite the degradation of forests in Lower Sugut due to timber extraction and fire, a key feature of this region is the variety of surviving forest types within a relatively small area. Forest diversity is most notable in the area around a site known as Manak (see map). Within a radius of 5 kilometres of this site are floodplain forests rich in figs, perupok forest, dipterocarp forest on sandstone ridges, heath forest, kapur forest and mangrove. If conserved along with timber production forests in Sugut Commercial Forest Reserve, this variety of forests is expected to be sufficient to sustain breeding populations of most of the eight hornbill species along with imperial pigeons and orang-utans. These species depend on year-round supplies of fruits, which does not occur in extensive tracts of a single forest type. Fig rich forest is particularly important for hornbills and orang-utans, in supplying food when there is no other fruit in the forest. Kapur trees in Lower Sugut have many large holes in the trunk, which represent the breeding sites of hornbills. Thus, the presence of kapur forest is also crucial, along with the variety of forest types, in sustaining breeding populations.

5.2 BENEFITS OF A RIVERINE CONSERVATION AREA

There are at least three kinds of biodiversity conservation benefits from retention of a forest corridor between the two sections of Sugut Commercial Forest Reserve :

- Preservation of the full original variety of forest types of Lower Sugut.
- Facilitation of regeneration of logged and also burned forest in Sugut Commercial Forest Reserve, as well as within the corridor, by allowing natural seed dispersers (e.g. hornbills, fruit bats, pigeons) to move between and within these Reserves.

- Sustenance of aquatic biodiversity in the Lower Sugut River, by buffering plantation runoff, supplying food input from overhanging trees and buffering water temperatures.

Retention of a forest corridor between the two sections of Sugut Commercial Forest Reserve can help to support the economy of Kg. Kaliaga and Kg. Pantai Buring by :

- Protecting freshwater fisheries.
- Allowing harvesting of forest produce by local residents for domestic and community use.
- Maintaining the option for a more diverse local economy (e.g. tourism) rather than having oil palm become the sole land use outside the Forest Reserve.

The only negative impact of retaining a forest corridor would be to forgo development of oil palm in the area retained.

5.3 CONCERNS OF LOCAL RESIDENTS

“There is a pervading sense of desperation with the insecurity of the current situation” (quotation from Background Paper 4). Major concerns of the residents of the Lower Sugut communities include: lack of security over land tenure; disappearance of forest resources from repeated timber extraction and fire; the power of commercial timber interests; the rapid spread of large oil palm plantations; unpredictable loss of crops and resources from drought, fire and floods; isolation from health facilities, educational opportunities and markets.

5.4 MAJOR THREATS TO BIODIVERSITY CONSERVATION

There are various threats to conservation of biodiversity in the Lower Sugut area. The following sections summarise the major threats. However, it is not easy to pinpoint which are direct and which are indirect, as they represent a complex of trends in economic and social change. It is relevant to note that these threats are also amongst the major concerns of local residents.

5.4.1 Fire

Fire, which may be set and allowed to spread either deliberately or accidentally in land being developed for plantations, or in land being cleared for rice fields, or in the Forest Reserve. Extensive forest fires were reported in the Sugut-Paitan area by a Sabah Air pilot to the IPPA team in May 1998. The fire was burning in a southwards direction during the IPPA aerial survey on 28 July 1998, in swamp forest, after several weeks of rain. At that time, there was one large area on fire and four small separate forest fires (seemingly set deliberately and recently within Sugut Commercial Forest Reserve). On 20 August 1998, during the IPPA workshop, a large plume of smoke visible from Kg. Pantai Buring indicated that the large fire was still burning. Based on a composite map prepared by the Centre for Remote Imaging, Sensing and Processing at the National University of Singapore, derived from satellite imagery, about 50,000

hectares of forest had burned in a continuous tract in the Paitan - Lower Sugut area up to September 1998.

Although a minority of the local community may see benefit in fires in providing support for granting land for oil palm plantations, the majority suffer from loss of forest products, and some from damage to their own crops.

5.4.2 Oil Palm Plantations

Large scale oil palm plantations are being developed near to and upstream of the area investigated under IPPA. Observations made during the IPPA aerial survey suggest that no environmental safeguards are being employed in clearing for plantations and, more seriously, clearing is being done in the absence of any regional land use plan. This is unfortunate in view of the fact that the main IPPA recommendation arising from the "forests in plantations" study (Payne, 1997) was that regional land use plans, incorporating "forest conservation areas", should be prepared before forested regions are opened up for large scale plantations. The initiative by PAMOL to submit an EIA, which incorporates such a land use plan, has not been successful in preventing clearance of forest (not by PAMOL) in proposed conservation areas.

The local community are concerned about the power of large companies to permanently change regional land use, local society and environmental quality.

5.4.3 Timber Extraction without Long-Term Management Plans

Timber continues to be taken by short-term licence holders within the northern section of Sugut Commercial Forest Reserve, which is also part of a forest management unit (FMU) under long-term licence agreement. This adversely affects the ability of the FMU licence holder to prepare and implement a sustainable forest management plan.

Any ad hoc commercial timber extraction that might occur within the section of Sugut Commercial Forest Reserve south of the river will also impair prospects for sustainable forest management.

Commercial timber extraction from State land and alienated land along the lower Sugut River, between Sugut Commercial Forest Reserve, affects water quality and forest regeneration potential.

Although some members of the local community benefit significantly from commercial timber extraction in receiving some of the money benefits, many do not, especially the poorest.

5.4.4 Unclear Land Policy and Land Alienation to Non-Residents

There is no evidence that traditional riverside settlement and farming along the lower Sugut River, of rice and other subsistence crops (i.e. customary rights), represents a significant threat to biodiversity conservation.

However, land applications in the riverine zone between the two parts of Sugut Commercial Forest Reserve appear to be processed on ad hoc basis. Based on observations made and comments received by the IPPA team, land is being alienated in this zone in the absence of a long term land use plan and to non-residents, and not based on customary rights.

5.5 ELEMENTS OF A LOCAL DEVELOPMENT PLAN

An ideal way to ensure that the natural biodiversity of Lower Sugut is conserved to the maximum reasonable extent and that local community concerns and aspirations are addressed, is to formulate and implement a regional development plan, incorporating local community needs (see conclusions and summary in Background Paper 4). It is beyond the scope of this study and report to propose all the elements of such a plan. However, there are several key elements which would help to meet the needs and aspirations of local people while at the same time help to conserve biodiversity. These elements include :

Proper development of large plantations

The EIA prepared for PAMOL (1998) provides a land use plan for about 20,000 hectares of Lower Sugut, and overlaps with the IPPA study area. This plan is what was envisaged in the recommendations arising from the IPPA workshop on forests in plantations (Payne, 1997). Biodiversity conservation and long-term environmental quality would benefit greatly from implementation of the recommendations contained within the PAMOL (1998) EIA. This is an excellent model EIA, and similar EIA's should be required for the remainder of the Lower Sugut region.

Land security for local residents

A major concern of local residents is that most have no legal security over land. This lack of security over land has adverse impacts on biodiversity conservation. One impact is that residents do not have the incentive or confidence to invest time, effort and money into planting long term crops such as oil palm; instead, there is a continuing reliance on gaining income from involvement in commercial logging and unsustainable harvesting of forest produce. Another impact is that some individuals see State land being granted to non-residents and turn to pressuring the authorities to excise Forest Reserve for local village members.

Land security for local residents can be addressed by one or both of two means. Firstly, riverine land near the villages should be allocated for alienation to residents, and not be made available for outside interests. Individual Native Titles of about 15 acres per family will be adequate. Since rice is grown on fields averaging 2 acres, with a fallow cycle of about 5 years, 10 acres is adequate in most years to supply traditional rice requirements. Households might choose to plant oil palm on all or part of their land area.

A second way to secure land tenure would be to reserve blocks of land as Native Reserve (under section 78 of the Land Ordinance) for purposes of traditional rice cultivation. Such land would be communally owned and managed.

Forest conservation area

In order to conserve examples of riverine forest and to link the various forest types of Lower Sugut into one conservation area, statutory means should be used to maintain part of the forest land between the two sections of Sugut Commercial Forest Reserve. Non-commercial harvesting of forest products for domestic and communal use by local village residents could be allowed.

Forest Reserve management

In order to ensure that examples of all the forest types of Lower Sugut are conserved and that there is a contiguous linkage between each forest type, it will be necessary to allocate “protection compartments” in both sections of Sugut Commercial Forest Reserve. Non-commercial harvesting of forest products for domestic and communal use by local village residents could be allowed.

6. RECOMMENDATIONS

6.1 INFORM RELEVANT AGENCIES

All government agencies relevant to implementation of the recommendations made in this report to be informed of their role and/or relevance.

ACTION 1

Copies of this report to be submitted for information and further action to : Sabah Forestry Department, Natural Resources Office of the Chief Minister's Department, Secretary of the State Cultural Heritage Council, Lands and Surveys Department, District Officer of Labuk-Sugut District, and Licence Holder for the Paitan-Sugut Forest Management Unit.

Implementation : Department of Environmental Conservation / Ministry of Culture,
Environment and Tourism

Timing : January 1999

6.2 REGIONAL LAND USE PLAN FOR LOWER SUGUT

The IPPA Forests in Plantations workshop report recommends that regional land use plans be prepared and implemented for forested regions where oil palm plantations are to be extensively developed.

Given the variety of land status in Lower Sugut, it is advisable to determine the location and extent of forest areas that merit protection, and seek the most appropriate statutory means to protect each.

There is no need to prepare a single new plan for Lower Sugut. A “regional land use plan” for Lower Sugut can be obtained by combining four items, three that exist and one that needs to be done. They are : (a) the EIA commissioned by PAMOL (1998) (see 6.3 below), (b) recommendations made in this report on land between the two sections of Sugut Commercial Forest Reserve (see 6.4 below), (c) recommendations made in this report for “protection compartments” within Sugut Commercial Forest Reserve (see 6.5 below), and (d) an EIA / plan, modelled on PAMOL (1998) that will need to be prepared for areas in the middle and Lower Sugut region, that are not covered by PAMOL (1998; see 6.6 below). In addition, steps need to be taken to ensure that any changes in village land use and small-holdings along the lower Sugut River are compatible with maintenance of good water quality (see 6.7 below)

ACTION 2

A single coordinating agency (Department of Environmental Conservation) to take the lead to implement a “regional land use plan” for Lower Sugut, by ensuring, assisting and guiding implementation of recommendations 6.3, 6.4, 6.5, 6.6 and 6.7 in this report.

Implementation : Department of Environmental Conservation

Timing : January 1999

6.3 PAMOL ENVIRONMENTAL ASSESSMENT (EIA)

The EIA prepared for PAMOL-Pelangi Jadi (PAMOL, 1998) for a proposed joint-venture oil palm plantation in the Labuk-Sugut District represents a good model for regional EIA's (as opposed to conventional project-based EIA's which have so far not proven effective for forestry and plantation agriculture activities). The same EIA can serve as a land use plan for the area of coverage, as proposed in the IPPA "forests in plantations" workshop report.

Approval and implementation of the EIA can (a) serve to conserve much biodiversity within the 20,000 hectare assessment area, (b) greatly enhance the value of the other conservation areas proposed in this report, (c) serve as a model for future agricultural plantation EIA's, and (d) serve as a precedent and model for future regional land use plans in forested regions not yet opened up for plantation agriculture.

The "ridge conservation areas" shown in the map (this report) represent parts of the areas recommended for conservation in the PAMOL (1998) EIA. Other conservation areas are included in the EIA.

ACTION 3

Approval and enforcement of the PAMOL EIA, irrespective of land ownership in the Sugut area. This will require that directives are made to owners / developer's of all oil palm plantations within the coverage of this EIA.

Implementation : Department of Environmental Conservation, in collaboration with Department of Environment.

Timing : January 1999

6.4 ESTABLISHMENT OF RIVERINE CONSERVATION AREAS, USING THE CULTURAL HERITAGE (CONSERVATION) ENACTMENT, 1997

As noted in section 1. Background, one way to help conserve biodiversity is to retain relatively small areas of forest land which link and/or extend existing, separate reserves. Conserving such small areas can have a disproportionately large positive impact.

Two “riverine conservation areas” are proposed, totalling about 450 hectares (see map). The larger area extends from near Kg. Kaliaga downstream to a site known as Tampak. The smaller area lies around the mouth of the Wansayon River and Timbusul Lake. These areas should be retained under natural forest cover. Local residents should be permitted to extract forest produce from these riverine conservation areas (notably wood, rattan, deer meat) for their own and community use, but not for commercial sale.

ACTION 4

Department of Environmental Conservation, Sabah Wildlife Department and the Secretariat of the State Cultural Heritage Council jointly to hold dialogues with village residents in Lower Sugut. The dialogues should explain and discuss the purposes of the proposed two “riverine conservation areas” the opportunity for joint management (by villages and Wildlife Department) and the legislation proposed to establish these areas. The government agencies should record views expressed, along with an assessment of the overall response of the villages.

Lead agencies: Department of Environmental Conservation, Sabah Wildlife Department *and the Secretariat of the State Cultural Heritage Council*

Timing : March 1999

Based on this report and on feedback from the villages obtained under Action 4, a proposal to be prepared for establishment of the Lower Sugut riverine conservation areas.

ACTION 5

A proposal to be prepared, recommending establishment of the Lower Sugut riverine conservation areas under section 4(1) of the Cultural Heritage (Conservation) Enactment, 1997, and submitted to the the State Cultural Heritage Council.

Lead agencies: *Secretariat of the State Cultural Heritage Council* with assistance from Department of Environmental Conservation and Sabah Wildlife Department
Timing : April 1999

ACTION 6

The "riverine conservation areas" (about 450 hectares) shown on the map to be gazetted under section 4(1) of the Cultural Heritage (Conservation) Enactment, 1997. Management of the riverine conservation areas to be delegated to the Sabah Wildlife Department.

Implementation : State Cultural Heritage Council. Management to be delegated to Sabah Wildlife Department.
Timing : Within 1999.

ACTION 7

Inform land owners and land applicants affected by the heritage conservation area designation.

Implementation : Lands and Surveys Department
Timing : Within 1999.

ACTION 8

Sabah Wildlife Department to inform local communities in Lower Sugut about the heritage conservation area designation, and liaise and collaborate with them to (a) develop a management plan and (b) allow members of the community to play an active role in use and management of these conservation areas.

Implementation : Sabah Wildlife Department, with local communities.
Timing : Within 1999.

6.5 PROTECTION COMPARTMENTS IN SUGUT COMMERCIAL FOREST RESERVE

In order to complete protection of a contiguous array of all the natural forest types of lower Sugut, and to afford protection to the scenically attractive Wansayon River area, it is recommended that three protection compartments are zoned in the management plans for Sugut Commercial Forest Reserve. The proposed protection compartments are shown on the map, as follows :

- a) Wansayon compartment (about 180 hectares)
- b) Merah compartment (about 600 hectares)
- c) Kumbawon compartment (about 640 hectares)

Exclusion of commercial logging from these compartments will afford protection to examples of floodplain forests, perupok forest, kerangas forest, mixed dipterocarp forest and kapur forest, and ensure that these forests remain contiguous with the coastal mangroves.

ACTION 9

The proposed Wansayon, Merah and Kumbawon protection compartments to be incorporated into the management plans for Sugut Commercial Forest Reserve.

Implementation : Sabah Forestry Department and forest management unit licence holders.

Timing : January 1999.

6.6 EIA FOR DEVELOPMENT OF OIL PALM PLANTATIONS THROUGHOUT SUGUT REGION

It is assumed that proposals and plans exist to convert much of the Sugut region to extensive oil palm plantations. Based on this assumption, an EIA should be prepared, covering all land in this region, other than Forest Reserves, village land and land not covered in the PAMOL (1998) EIA. This EIA can be achieved by requiring a joint effort by the various companies intending to develop plantations in this region. The PAMOL (1998) EIA can serve as a model.

ACTION 10

A regional EIA to be prepared jointly by all the companies developing or planning to develop oil palm plantations in the Sugut region. This EIA will need to be evaluated and approved for implementation. This may be done under the provisions of the Conservation of Environment Enactment.

Implementation : Department of Environmental Conservation, to require that the relevant companies combine resources to prepare the EIA for submission for evaluation.

Timing : Early 1999.

6.7 APPROPRIATE DEVELOPMENT OF VILLAGE LANDS

As the process of determining the long-term pattern of land tenure and land use in Lower Sugut develops, there are likely to be changes in the socio-economy of local community residents. Overall, the regional pattern of land tenure and use will be divided into three main types : large oil palm plantations, forest land (including Forest Reserve and forest conservation areas) and small-holdings and othe village land. Plantations and forests are covered under recommendations 6.3 - 6.6. Possible changes in land use by village residents may need to be addressed. For example, oil palm should not be planted up to the river bank in villages.

ACTION 11

Trends of change in village and small-holder land use should be monitored, and steps taken, if necessary, to ensure maintenance of good water quality.

Implementation : Department of Environmental Conservation

Timing : During 1999 and beyond

6.8 PROVISION OF SECURE LAND TENURE TO NATIVE RESIDENTS OF LOWER SUGUT COMMUNITIES

Equitable allocation of land and security of land tenure should be provided to the native residents of Lower Sugut so that they can better plan for their future.

It is recommended that processing of existing land applications in the area surrounding and between Kg. Pantai Buring and Kg. Kaliaga be frozen, pending implementation of a process to ensure appropriate allocation of land titles. The relevant government authorities should decide on the size and configuration of individual family lots only after consultation with the Pantai Buring and Kaliaga communities, and with any other relevant stakeholders.

These consultations should include discussion of the possibility of reserving some land as Native Reserve, under section 78 of the Land Ordinance, for purposes such as traditional rice farming.

ACTION 11

MOCET to write to Lands and Surveys Department and District Office Labuk-Sugut to: (a) suggest that in general, native residents of Kg. Pantai Buring and Kg. Kaliaga be given priority over other land applicants in allocation of land and issuance of titles along the Sugut River around and between these two villages and (b) draw attention to the points made in the Recommendation above.

Implementing agencies: MOCET, Department of Lands and Surveys, Labuk-Sugut District Office

**MAP 1 LOWER SUGUT: PROPOSED CONSERVATION AREAS
AND FOREST RESERVE PROTECTION COMPARTMENTS**

APPENDIX I PLATES

PLATE 1. Boat construction at Pantai Buring, a village on the Lower Sugut River. The community depends to a large extent on natural resources for livelihood and income. Apart from supplying wood for boats and houses, riverine and floodplain forests supply leaves, fruits and insects which help to maintain fish populations. Rice is grown on riverside alluvium with fallow periods that allow trees to recover and suppress weeds.

PLATE 2. The villages of Lower Sugut are entering a period of profound changes in society, land use and economy. Timber supplies have been drastically depleted and nearly eliminated by repeated commercial logging (1960's onwards) and fires (1998). Oil palm plantation companies are entering the region. Many local native residents do not have security of land tenure. Immediate attention needs to be given to land use planning and security of land tenure in order to provide fair opportunities for residents, such as these boys from Kg. Kaliaga schooling at Kg. Pantai Buring.

PLATE 3. The Lower Sugut River, at the uppermost end of Kg. Pantai Buring, showing the junction with the Wansayon River (near top left of picture). From May 1998, fire swept through the forest shown here, on the north side of the Sugut River, devastating large areas of forest up to the village. Note the logging road.

PLATE 4. Interior of one of the houses on the small farms on the south side of Sugut River, visible left of centre on Plate 3. This family has moved from a village upstream down to Pantai Buring. The larger population upstream and ongoing development of extensive plantations in the middle Sugut region means that pressure for land is increasing. This family depends primarily on subsistence farming, rather than fisheries.

PLATE 5. The 1998 fires continued to devastate perupok forest until at least August 1998, after several months with rain. This picture was taken on 28 July 1998 over Sugut Commercial Forest Reserve. Note the canals constructed to float perupok logs out to the Sugut River.

PLATE 6. The value of conserving natural forests and ecosystems in Lower Sugut, in terms of supplying food and other resources to residents of Kg. Pantai Buring and Kg. Kaliaga, has been estimated at a minimum of RM5,645 per household per year. Such valuation should be taken into account when planning changes in land use and land tenure for Lower Sugut. Oxbow lakes, such as Danau Bebedingan shown here, represent fish breeding areas and fishing sites.

PLATE 7. On 20 August 1998, a workshop was held at Kg. Pantai Buring, at which discussions were held by residents of Pantai Buring and Kg. Kaliaga, on options for conservation and development along the Lower Sugut River. This picture shows one of five village resident groups in discussion.

PLATE 8. Aerial view of Lower Sugut River at the Tanjung Manak area (the name of the river bend at centre of the picture). Historically, every bend of the river and every major natural feature of the environment had a name. The long oxbow lake (cut-off section of river) at bottom left of the picture is known as Bunduton, while the filled-up lake on the far side of the river is Rendamon. Most of this area is rich in fig trees and strangling figs, which traditionally were not felled for farming (e.g. note the large-crowned trees at bottom centre). In 1993-94, a temporary riverside settlement was established for rice farming near Tanjung Manak. The low bushy vegetation visible along parts of the main river are the abandoned rice fields.

PLATE 9. Bukit Kembawon, the steep sandstone hill on the right bank of the Sugut River, upstream from Manak. This is a scenically attractive part of Lower Sugut, with steep escarpments, tall forest below and heath forest on the ridge tops.

PLATE 10. The oriental darter (*Anhinga melanogaster*), known locally as *sinsilog*, photographed on the Wansayon River. This species represents one of the readily-seen wildlife attractions of Lower Sugut, along with hornbills and monkeys. There is good tourism potential in Lower Sugut, once the region has become more accessible through oil palm plantations, and as long as sufficient natural forest is retained to support breeding populations of wildlife.

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