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**Ministry of Tourism and Environmental Development, Sabah**

**Danish Co-operation for Environment and Development (DANCED)**

# **Sabah Biodiversity Conservation Project, Malaysia**

**Kinabatangan Multi Disciplinary Study**

**August, 1996**

**Project Co-ordination Unit**

**Technical Assistance :**

- **COWI in association with ORNIS Consult  
and World Wide Fund for Nature (Denmark)**
- **World Wide Fund for Nature Malaysia**

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**Dr. Junaidi Payne**

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## **1. INTRODUCTION - THE HISTORICAL CONTEXT**

This report concerns conservation of biological diversity in the lower Kinabatangan area of eastern Sabah (see map). This area represents one portion of the Kinabatangan District and incorporates the floodplain and adjacent flood-free land of the Kinabatangan River. The area investigated is hereafter referred to as "lower Kinabatangan".

Since much of lower Kinabatangan is being converted from forest to plantations, and the human population is increasing, biodiversity conservation cannot be addressed separately from development. The current issues and problems confronting those concerned with sustainable development in lower Kinabatangan can best be understood through an appreciation of the historical context. The recent history of the area is one of rapid exploitation of natural resources. Coupled with that, the human communities have changed within the space of barely two generations from being almost self-sufficient in food and harvesting abundant forest resources for cash income, to being dependent largely on imported food from shops and experiencing declining sources of cash income. Having passed through a four-decade period of opportunities to accumulate wealth, both directly and indirectly from timber and land, many local residents now find themselves with only small amounts of these resources, and without the skills needed to seek alternative sources of sustained income.

In the early 1950's, the region consisted mainly of old growth forests, with a history of very light and mainly sustainable harvesting of natural products. The human population consisted of about eight villages confined to the banks of the Kinabatangan River, with rice planted on fertile riverside terraces, fish supplying protein, and the sale of forest products such as edible birds' nests, rattan and tree resins providing adequate cash income. Large-scale timber harvesting started in the mid 1950's. Many male youths and men started work in the timber camps and on the boats pulling logs to Sandakan. Many of them spent the remainder of their working life still involved in some way in the local timber industry. Some applied for and were granted their own areas from logging. Others claimed that they have traditional rights to the forest land within the area, and have acquired income from unlicensed logging. The majority of living men have known a life where timber was plentiful, and where adequate income could be made by involvement in logging for a few months each year.

During the period 1972-75, a Land Capability Classification of Sabah was conducted by the Land Resources Division of the Ministry of Overseas Development, United Kingdom. The study concentrated mainly on mining and agricultural potential, and made minimal provision for biological conservation. The policies of the State Government from 1976 until the early 1980s' favoured rapid and widespread liquidation of forest and land resources, with forests seen as a means to produce large amounts of money for investment in other sectors, notably agriculture. Thus, during this period, the majority of land in the lower Kinabatangan was made available for alienation (that is, sale by the State to private individuals and companies) for conversion to agriculture. Local residents and others alike

saw the potential for making windfall profits. Unclaimed land, still abundant, could be applied for and profits made from selling rights to timber on that land and, later, by selling the land. By the late 1980's, earlier expectations that cocoa plantations would become a major form of land use were replaced by recognition that oil palm would become the major crop for lower Kinabatangan. Since then, a relatively small number of companies have been acquiring most of the land in lower Kinabatangan for expansion of oil palm estates.

Thus, many and possibly most resident families have become accustomed to an economy based upon a system which was unsustainable and which would eventually cease to exist. That time has now come.

## **2. OBJECTIVES**

To establish a foundation for (a) further actions in favour of biodiversity conservation in the lower Kinabatangan region, and (b), in general terms, appropriate land use allocation in the lower Kinabatangan region.

### 3. METHODS

The main study period ran from 1 March - 31 August 1996. Additional work compiling information from specialist reports and formulating recommended actions was done after that period.

The study area consists of the floodplain of the lower Kinabatangan River and adjacent flood-free lands. This study concentrated attention in a zone within 5 kilometres of both sides of the main river, from Kampung (Kg.) Abai at the river mouth, up to the mouth of the Lokan tributary (at Sungai Lokan on the map). This zone incorporates: examples of all the major known natural habitats within the region (various freshwater swamp forests; riverine forests; dry land forests; limestone outcrops; oxbow lakes; large and small tributaries of the main river; seasonal open swamps); all major freshwater fishing sites; all sites currently visited by tourists; and the following villages

<b>Village name</b>	<b>Number of inhabitants</b>
Abai	290
Sukau (includes Melapi)	786
Bilit	296
Batu Putih (includes Mengaris)	821
Bukit Garam	768
Danau Ria	309
Buang Sayang	535
Kuala Sungai Lokan	173
Perpaduan Datuk Mohd. Ugi	173
Sentosa Jaya	480
<b>Total</b>	<b>4,631</b>

(Source: Kinabatangan District Office, 1996)

All these villages have their origins in old settlements along the main Kinabatangan River, except the last two, which are new villages established since the 1970's along the Sandakan-Lahad Datu highway by settlers from the older villages.

The greatest concentration of people in the area, lying immediately outside the main study area, lies within about 12 villages between Bukit Garam and Kota Kinabatangan. Many of the families in this zone originate from the older riverside villages.

Specialists conducted studies on botany, fisheries, tourism and the economy of the older villages. Group meetings and dialogues involving Wildlife Department staff and technical advisers were conducted with the District Office, villagers (in seven villages) and five tour operators. Botanical work included compilation of botanical records from lower Kinabatangan in the Herbarium of the Forest Research Centre (FRC) at Sepilok, field collections of plants, analysis of aerial photographs (1971, 1986 and 1995) and

discussions with botanists at FRC. All botanical work was done in co-operation with FRC and with staff of the mapping and remote sensing sections of Sabah Forestry Department. Fisheries work included compilation of available information, sampling along lower Kinabatangan and questionnaires/discussion with local fishermen. Tourism work involved visits to existing and potential tourism sites, informal and formal discussions with village representatives, and discussions with tour operators and their staff. Economic work focused on assessing the socio-economic status and views of native local residents in selected villages. The surveys involved preliminary discussions with the District Office and villagers, followed by a series of organised dialogues with seven villages (Abai, Sukau, Bilit, Sentosa Jaya, Batu Putih, Bukit Garam and Kuala Sungai Lokan). In each village, three groups (men, women and youth) were targeted separately.

Based on the specialist studies, key issues relating to biodiversity and the local economy were identified. As part of the overall analysis, a two-day workshop was held in Sandakan to obtain feedback on results and the study team's preliminary proposals, from village representatives (14 August) and relevant government agencies / private sector (15 August).

## 4. RESULTS

### 4.1. Forest, Flora and Land Use

The percentage of land area under natural forest cover in the lower Kinabatangan region was estimated from aerial photographs to have declined from 91.9% in the early 1970's to 46.7% in 1995. The rate of decline was not constant during that period. The majority of change has occurred since 1990 and consisted of expansion of oil palm plantations, from 3% of land use in the 1970's (mainly represented by a single Sabah Land Development Board scheme at Suan Lamba) to 42% in 1995. Percentage of land area consisting of occupied villages remained constant at about 0.1%.

The approximate area of land in lower Kinabatangan currently allocated as permanent forest (excluding mangrove forests) is as follows:

Status	Area (hectares)
Forest Reserve	11,660
SAFODA rattan plantation	8,200
Wildlife Sanctuary	27,000
<b>Total</b>	<b>46,860</b>

The conventional classification of forest types in lower Kinabatangan separates the following: mangroves, nipa, freshwater swamp forests, riverine forests, lowland dipterocarp forests and forests on limestone. Additional natural habitats are the rivers, streams, oxbow lakes, seasonal lakes in low-lying areas and non-forest vegetation on limestone. It is estimated that freshwater swamp forests occupy about 72,000 hectares in lower Kinabatangan, of which 20,000 hectares are in permanent swamps on alluvium, 13,500 hectares are on thin peat on alluvium, and 38,500 hectares are on waterlogged and seasonally flooded land.

Floristic and ecological classifications of the Kinabatangan freshwater swamp forests do not exist. Further botanical collections and research are needed to derive a classification. It is likely that not all forest types are represented in the existing Forest Reserves and wildlife sanctuary. The botanical consultant to this study collected at least three plants from lower Kinabatangan which may be undescribed species. These are of the genus *Cerescoides* and *Psychotria* (family Rubiaceae) and *Begonia* (family Begoniaceae).

Almost all the remaining forests in lower Kinabatangan are heavily degraded by repeated logging and a few areas were burned during a drought in 1983. The only areas where forest structure and botanical composition resemble that of original forest occur in scattered portions of the Forest Reserves and the SAFODA rattan plantation, and in some riverside areas where the forest is actually young, in the early stages of biological succession. Large tracts of the wildlife sanctuary are essentially species-poor secondary forests. Trees of the family Leguminosae, Lauraceae and Bursaraceae which form important components in the diet of primates, rodents and hornbills are rarely seen outside the Forest Reserves and SAFODA area.

## 4.2. Fisheries

Fishing methods used in lower Kinabatangan include gill nets, cast nets, trammel nets, long lines, hook and lines, and traps. Although many species of fish are taken and the importance of fisheries varies between villages, several genera are of general economic significance in lower Kinabatangan including Wallago (ikan tapah), Pangasius (ikan patin), Oxyleotris marmoratus (ikan ubi), several genera known as ikan putih, and Macrobrachium rosenbergii (udang galah), the giant freshwater prawn.

Most families have abandoned fishing as a significant economic activity. There appear to be several reasons for this including the following:

- ♣ reported declines in catch per unit effort since the 1960's (current average catches estimated during this study were less than 2 kilograms/hour for nets and lines). This is attributed to various factors including destruction of upstream breeding areas through logging and plantation expansion; greatly increased suspended solids due to removal of natural vegetation; toxic runoff from plantations; and illegal use of poisons to harvest fish;
- ♣ the lack of a region-wide organised system for storing fish on ice and for marketing;
- ♣ the availability of cheap salted (marine) fish from Sandakan, which are purchased for home consumption; and
- ♣ fundamental, area-wide changes in society, especially amongst the youth.

However, some families do obtain significant income from fisheries, concentrating on high value species, notably live ikan ubi or giant freshwater prawns. A constraint to adoption of aquaculture in lower Kinabatangan appears to be periodic flooding of ponds.

## 4.3. Tourism

On the assumption that special attention needs to be given to the role of local residents in tourism, five villages were examined in detail for this study, and key results are as follows:

Sukau. Main tourism issues Readily accessible; tourism established, by urban-based operators; several prime sites available, but only some utilised. Constraints Communication and collaboration within the village is weak; various problems are identified by individuals potentially interested in tourism, but existing opportunities not utilised.

Abai. Main tourism issues Access expensive; tourism not established (but occasional tourist arrivals); several prime sites available. Constraints Communication and collaboration within the village is weak; a few individuals interested in tourism, but distance from Sandakan poses problems.

Bilit. Main tourism issues Ease of access varies with rainfall and road condition; tourism not established (but occasional tourist arrivals); several prime sites available. Constraints

Communication and collaboration within the village is weak; persons interested in land and timber tend to dominate discussions, and little serious interest in tourism apparent.

Batu Putih. Main Tourism issues Access easy; tourism is known to the village due to the existence of a tourist "jungle camp" nearby, initiated by a Sandakan-based operator in 1991; several prime sites available; some youths interested in developing their own "jungle camp". Constraints Communication and collaboration within the village is weak.

Sentosa Jaya. Main tourism issues Access easy; currently no tourism; two potential sites (Butong lakes and Batu Talai limestone) far from village and threatened by non-sustainable exploitation; communication within the village community is good.

Constraints Potential sites limited, far and degraded; many villagers have houses/activities elsewhere.

Although the existence of tourism operations and high potential for tourism development in lower Kinabatangan are now widely known in Sabah, several important gaps and weaknesses exist, notably the following:

- formal tourism policy, planning process or plan exists specifically for lower Kinabatangan;
- government agencies exist for decision making on specific tourism projects on alienated land, for enforcement of national tourism legislation and for tourism promotion, but not for planning;
- following two pioneering tourism products dating from 1991 (lodge and river cruise based at Sukau, and jungle camp at Girang lake), development of new products and services has been slow, and has apparently halted during the past year;
- involvement of local residents in tourism is limited and shows no sign of significant increase in the absence of government or NGO initiated projects or capacity-building activities; and
- integration is weak both within and between the stakeholders (government agencies, villagers, private companies) in the lower Kinabatangan.

#### ***4.4. Villages and Local Economic Issues***

There are differences between men, women and youth in the issues each group sees as important in lower Kinabatangan. Men tend to focus on land, money, timber, wildlife and lack of benefits from tourism. Women and youth raise a variety of issues relating to employment, education, health and quality of life.

Based on dialogues with seven villages (Abai, Sukau, Bilit, Batu Putih, Bukit Garam, Kuala Sungai Lokan and Sentosa Jaya), the following economic activities were identified by villagers and ranked (in descending order of priority):

- ◇ farming;
- ◇ fishing;

- ◇ extraction of forest produce;
- ◇ small businesses;
- ◇ government employment;
- ◇ animal husbandry (mainly poultry);
- ◇ provision of transport (boats, minibuses);
- ◇ oil palm cultivation;
- ◇ cultivation of other tree crops (fruits, cocoa, coffee etc.);
- ◇ wood-working (building of houses and boats);
- ◇ labour on large plantations.

However, this overall ranking obscures great differences between villages, families and individuals, and also does not accord entirely with independent observations. For example, there is little sign of farming in the villages, and the specialist fisheries report for this study indicates that fishing is of no significance for most families. Some families obtain irregular but very significant income from application for and sale of land, cutting and selling timber, government contracts and edible birds' nest sales. Many families seem to rely on government employment amongst mature children, rather than farming, for regular income. Also, many families have houses, close relatives or sources of income in Sandakan, which are not reflected in the dialogues.

Based on dialogues with the seven villages, the following problems were raised by villagers and ranked (in descending order):

- ◇ lack of clean, safe domestic water supply;
- ◇ problems said to be associated with establishment of a wildlife sanctuary;
- ◇ crop damage by wildlife;
- ◇ low income and limited employment opportunities;
- ◇ land applications not processed;
- ◇ insufficient capital for planting, especially oil palm;
- ◇ river pollution;
- ◇ poor access roads;
- ◇ insufficient development in general;
- ◇ shortage of health services;
- ◇ difficulties in marketing produce;
- ◇ youth unemployment/underemployment;
- ◇ flood damage to houses;
- ◇ no electricity supply;
- ◇ cultivated land acquired by large plantation estates.

Two points are to be noted in particular. Firstly, the high importance placed on domestic water supply and also river pollution clearly indicates a need for some attention, and contrasts with the low importance accorded to lack of electricity supply, and absence of comment on telephones which are absent, scarce or frequently break down. Secondly, the

high frequency of comments relating to problems associated with the wildlife sanctuary (mainly perceived loss of opportunities to apply for more land and to cut timber for commercial sale) and crop damage by wildlife (mainly elephants) reflects partly the fact that this study was associated with the Wildlife Department. Expansion of oil palm plantations plays a bigger role in loss of access to land and timber, and in exacerbating elephant damage to crops.

Based on dialogues with the seven villages, the following proposals were made by villagers for activities to enhance income:

- \* tourism / homestay;
- \* programme to create youth employment;
- \* programme to increase women's income;
- \* aquaculture (pond and cage);
- \* village co-operatives for marketing produce;
- \* credit scheme for developing oil palm smallholdings;
- \* a project to support commercialisation of short-term crops;
- \* assistance for marketing of harvested rattan;
- \* shop-houses at Batu Putih;
- \* rehabilitation of freshwater spring at Bukit Tawalus, Kg. Sentosa Jaya, for village water supply;
- \* investigation of crocodile farming at Bukit Garam.

In addition, the field study team raised with villagers the possibility of deer farming, "social forestry", swiftlet farming and "living fences" (fences of timber trees), and interest was expressed in all.

## **5. STATEMENT AND EXPLANATION OF THE KEY PROBLEM**

The key problem to be tackled is that current development trends in lower Kinabatangan are unsustainable if not modified, and do not address the needs of all stakeholders.

If current trends continue without modification, there will be three clear benefits:

- ♣ continued expansion of palm oil production;
- ♣ increased federal tax revenue, some of which will be channelled back to development in Sabah; and
- ♣ input of cash into the Sandakan-Lahad Datu regional economy from spending by people working in the local oil palm industry.

However, without modification of current trends, the following problems and losses will continue:

- declining sources of income for local native residents;
- minimal capacity building amongst local native residents for switching to sustainable income generation;
- declining water quality;
- declining fisheries;
- increasing numbers of immigrant workers, entailing increasing pressure on health and education services;
- total loss of regional timber production capacity;
- limitation in scope to develop ecotourism; and
- widespread loss of biodiversity.

The question arises as to why the trends observed at lower Kinabatangan have arisen and why they are continuing. From this study, three major answers can be identified. Firstly, as outlined in the Introduction, during the period mid 1970's to early 1980's, when most timber production Forest Reserves were dereserved and the land made available for alienation, there was an implicit assumption that a complete switch in regional land use and economy from timber production on State owned land to large scale privately owned agriculture would be beneficial to all stakeholders. Consideration was not adequately given to specifying how the money benefits would be apportioned and invested, or to the costs and availability of labour for large plantations, or to protecting the natural environment, notably water and biodiversity. The second answer is that a detailed District land use plan has not been officially adopted in order to guide land allocation in lower Kinabatangan. The process of preparing such a plan would examine such considerations and allow land to be allocated according to actual conditions and needs, including

environmental, social and economic. The third answer is that insufficient opportunities exist whereby local communities, accustomed to abundant timber and land, and obtaining income from these resources, can switch to alternative economic activities.

The first of these three points represents a phase in history which cannot be remedied. The second point can be addressed to some extent by prioritising the need for District land use planning mechanisms, based on environmental protection and the long-term needs of residents villagers. The third point must be addressed by striving to increase the array of opportunities for local residents to evolve a sustainable economic base.

## **6. DISCUSSION**

In order to appreciate the problems relating to biodiversity conservation and the socio-economy of lower Kinabatangan, it is insufficient to discuss flora, fisheries, tourism and the village economy alone. Other sectors are the main determinants of future development in the area. For the purpose of this discussion, five main sectors are identified as especially relevant to biodiversity conservation and sustainable socio-economic development in lower Kinabatangan: Government, oil palm industry, wood-based industry, local villages and tourism.

### **6.1. Government**

The absence of a formal Government plan for integrated development of lower Kinabatangan, in particular the absence of a long-term land-use plan, is the basis of most of the problems relating to biodiversity conservation seen today. This has become apparent to the relevant agencies in recent years and steps are being taken to rectify the worst problems. However, past commitments made for land alienation remain a serious constraint to minimising loss of forest from environmentally-sensitive sites and to limiting future water pollution.

The decisions made in the 1970s' and early 1980's to dereserve all timber production Forest Reserves in lower Kinabatangan (traditionally Sandakan's main source of timber for export), along with the decisions made later to locate two of Sabah's six Integrated Timber Complexes at Sandakan and to ban log exports, represent policy decisions which have contributed towards repeated, unsustainable logging (both licensed and unlicensed) in lower Kinabatangan. With this example, it may be seen that a few fundamental policy decisions can profoundly affect not only biodiversity conservation but many aspects of society and economy for the following decades.

It is important to appreciate that macro-level policies concerning long-term development in lower Kinabatangan remain unclear. For the three main industries which rely on the natural resources of the lower Kinabatangan (oil palm, timber and tourism), current policies support the first two to an unlimited extent, while at the same time limit the sustainability of the third. Of the three, oil palm enjoys the brightest prospects in the short to medium term but is likely to be more limited in the future due to constraints such as labour shortage and unpredictable floods. Timber enjoys the worst prospects because little timber remains and State policies, plans and programmes to make up the future shortfall are of limited relevance to lower Kinabatangan.

Tourism has bright prospects in the long term because river-based transportation to proven products can be extended along the river, for domestic as well as foreign markets. Also, unlike most present adults, the younger generation in lower Kinabatangan will be increasingly attracted to work that relates to tourism. Yet policy has been insufficient to permit the reservation of a wildlife sanctuary of size adequate to maintain wild breeding

populations of the very species (e.g. orang-utans, elephants, hornbills) that would continue to attract tourists long-term.

### **6.2. Oil Palm Industry**

Of the three economic sectors which are prominent in lower Kinabatangan, the oil palm industry is now easily dominant in terms of land use and money generated. However, employment of local people seems limited mainly to junior supervisory and clerical jobs. The usual reasons given by local residents for not working in oil palm harvesting, transporting and processing jobs is that salaries are too low and working conditions poor. This may be only part of the reason. In the timber industry, it is noted that logging contractors employ tree-fellers and skidder drivers who can make in excess of RM3,000 monthly, yet local villagers do not work in those jobs either.

Land planted with oil palm in lower Kinabatangan has been alienated at land premiums which are below market value of the land and with annual rents which are trivial and bear no relationship to profits made from the land. The main source of environmental degradation in lower Kinabatangan is no longer logging, but oil palm plantations and mills. In short, the oil palm industry enjoys enormous benefits from its recent and continuing expansion in lower Kinabatangan, but confers minimal benefits to either the local community or to the State Treasury.

### **6.3. Wood-Based Industry**

From the mid 1950's until the early 1990's, the wood based industry was the dominant influence in lower Kinabatangan. Although quantitative data are not readily available, the industry must have supplied the single biggest source of wealth in the region to both local communities and the State Government during that period. Now that timber supplies have been almost entirely liquidated outside the Forest Reserves, this is no longer the case. Since there are no Commercial or Domestic Forest Reserves, nor Native Reserves for timber production, in lower Kinabatangan, there will eventually be no timber production whatsoever in the region. This will be true whether or not a wildlife sanctuary exists.

During this study, some local residents stated that the sanctuary prevents people from obtaining wood. This is not true. Without a sanctuary, all land outside Forest Reserves would have been converted to oil palm plantation or other forms of cultivation and settlement. The only way local people can enjoy future access to timber trees will be for them to ask the Government to reserve specific land areas for this purpose.

As for the wood-based industry, under current policy and trends, it will have to be assumed that no more timber will come from lower Kinabatangan downstream of Segaliud-Lokan Forest Reserve, unless private land-owners opt to plant timber trees. If the industry wants future timber supplies from lower Kinabatangan, it will have to support a policy that remaining State lands be allocated for timber production and/or that the conditions of title of existing land owners be amended to oblige them to plant timber

trees. In addition, or alternatively, Government would have to implement indirect policies and incentives to persuade land owners to manage land for timber production.

In short, the timber industry has contributed substantially to the State budget over a forty year period but little to sustainable development in lower Kinabatangan, and will very soon cease to exist there unless Government policy is profoundly amended. In deciding appropriate policy, three factors should be considered. Firstly, owners and applicants of land in lower Kinabatangan will generally not be favourable to planting timber trees because oil palm is currently more lucrative. Secondly, the land still potentially available for timber production is degraded, limited in extent, and scattered; large blocks suitable as Commercial Forest Reserve do not exist. Thirdly, local families in lower Kinabatangan urgently need new sources of income, so that timber policy should ideally result in activities that generate sources of income for these families.

#### **6.4. Local Villages**

It appears that there is an element of bias in the issues raised by villagers who knew that members of the study team were connected with wildlife (and tourism; see below). During meetings and dialogues held for this study, it was found that the presence of the Wildlife Department and the process of establishing a wildlife sanctuary were referred to repeatedly by certain men as sources of various problems. For example, some individuals complained of crop damage by elephants, as if this problem is due to the existence of a sanctuary and failure on the part of Wildlife Department. In fact, elephants have periodically raided village gardens since early times and, if rates of damage have increased recently, more likely this is a result of expansion of plantations. Other individuals complained that the sanctuary is taking their land, whereas there is evidence that some people already own undeveloped land and have applied for more land, well outside traditional village limits.

Amongst the issues of concern expressed by villagers are insufficiency of services such as water supply, electricity, roads and health care. Under current conditions of scattered, small villages and declining sources of income from natural resource exploitation, significant improvement in these services may be difficult to justify in purely economic terms. Surprisingly, insufficiency of telephones was an issue not raised during dialogues for this study, even though this is linked to development of tourism by villagers. It should be cautioned that tourism development in lower Kinabatangan will not be a quick problem-solver. However, tourism could act as a catalyst to improvements in infrastructure.

### **6.5. Tourism**

Tourism in lower Kinabatangan is currently based entirely on the natural attractions of the region. All the tours and tourism products available have been initiated and are managed by entrepreneurs from Sandakan and Kota Kinabalu. During meetings and dialogues held for this study, some villagers referred repeatedly to tour operators as benefiting from wildlife but not helping villagers by providing jobs or other forms of compensation. Tour operators state that they have made many attempts to provide opportunities. It would seem that amongst the problems involved are unrealistically high salary expectations amongst village men and inconsistency in supplying operators with services and goods agreed upon. The lack of English speaking ability is another issue, possibly exaggerated, because at Kg. Sukau there are untapped opportunities for supply of goods and services other than guiding.

The difference of perceptions between villagers and tour operators is partly a result of insufficient dialogue between the two. Also, the switch from a natural resource exploitation economy (at least, for men) to a service economy based on preservation is something that cannot be achieved rapidly. More time and patience are needed, with government agencies and NGO's providing facilitating and support roles.

Currently, apart from the problems outlined above and excessive use of the Menanggul River for wildlife viewing, there are no obvious signs of conflict between the goals of biodiversity conservation and tourism development at lower Kinabatangan. However, the absence of any formal written policy or tourism development plan is a weakness which needs to be remedied if natural habitats and wildlife are not to be affected adversely by future tourism expansion.

## 7. RECOMMENDED ACTIONS

Recommended follow-up work is listed as a series of Actions. All Actions are mutually supportive, promoting both biodiversity conservation and sustainable socio-economic development in lower Kinabatangan. The list is arranged in three sections, based on degree of urgency for implementation. Section A includes the highest priority actions that should be initiated at the earliest possible time. Section B includes priority actions that should be initiated during the first half of 1997. Section C consists of other actions that may be started at any time.

Key features of the actions as a whole are that they should promote diversity, sustainability and equitability, in addition to biodiversity conservation.

### Abbreviations and signs

ACLR	Assistant Collector of Land Revenue
BPM	Bank Pertanian Malaysia
C.L.	Country Land (referring to land alienated for agriculture on a 99 year "Country Land" lease)
DID	Department of Irrigation and Drainage
DO	District Office
DOE	Department of Environment
DOF	Department of Fisheries
DS	District Surveyor
FELCRA	Federal Land Consolidation Rehabilitation Authority
JKKK	Jawatankuasa Kemajuan & Keselamatan Kampung (Village Development & Security Committee)
Kg.	Kampung = village
KPD	Korporasi Pembangunan Desa
LUC	District Land Utilisation Committee
LSD	Lands & Surveys Department
MOCAT	Ministry of Culture, Arts and Tourism
MRDE	Ministry of Resource Development and Enterprise
MRD	Ministry of Rural Development
MTED	Ministry of Tourism & Environmental Development
MTPB	Malaysian Tourism Promotion Board
NGO	Non-governmental organisation
NRO	Natural Resources Office of the Chief Minister's Department
PD	Police Department
PORIM	Palm Oil Research Institute Malaysia
N.T.	Native Title (referring to small-holding land alienated to natives in perpetuity)
SAFODA	Sabah Forestry Development Authority

SAGC	State Attorney-General's Chambers
SDD	State Department of Development
SFD	Sabah Forestry Department
STPC	Sabah Tourism Promotion Corporation
SWD	Sabah Wildlife Department
TRPD	Town & Regional Planning Department (also known as Town & Country Planning Department)
WD	Water Department
(W)	Actions for which continued involvement and assistance from WWF Malaysia would be appropriate, based on work done to date, should this be desired by the relevant government agencies

**A. HIGHEST PRIORITY ACTIONS TO BE INITIATED AT THE EARLIEST POSSIBLE TIME**

**ACTION A 1 REPORT DISTRIBUTION**

Work to be done

Distribution of this report to all agencies listed under Implementing Agencies in this report, and any other relevant agencies.

Implementing agency

MTED

Main aims / benefits

To ensure that all relevant agencies are aware of the issues identified in this study relating to conservation and sustainable socio-economic development.

Further study needed?

No.

Budget needed

For printing of additional copies of the report.

Timing

Immediately after acceptance of this report.

**ACTION A 2 CABINET DECISION ON OVERALL DEVELOPMENT AND LAND USE POLICY  
FOR LOWER KINABATANGAN (W)**

Work to be done

Formulation of a draft macro-level policy on the extent of land to be allocated in lower Kinabatangan for villages, oil palm, timber production and natural habitats (the main support for sustainable tourism). The draft National Wetlands Policy documents and the findings of the Sabah State level workshop on wetlands (26 September 1996) may be used to guide the preparation of this paper.

Preparation and submission of a Cabinet paper on the above policy proposal.

Implementing agency

DO in collaboration with relevant agencies, including DID, DOF, MRDE, MRD, MTED, SFD, SWD, TRPD and community leaders.

Main aims / benefits

To minimise any incompatibility and ambiguity in Government policy relating to lower Kinabatangan.

To lay the foundation for land use planning and sustainable socio-economic development in lower Kinabatangan.

Further study needed?

Yes. Short study to determine appropriate extent of the four main forms of land use. To be conducted a small task group of competent agencies.

Budget needed

Small, for site visits.

Timing

Ideally, immediately after acceptance of this report. However, other Actions should not be delayed to await implementation of this Action.

**ACTION A 3 DECISION MAKING ON REMAINING STATE LANDS IN LOWER  
KINABATANGAN**

Work to be done

Make decisions on future land use and land status of remaining State lands, based on long-term protection of environmental quality and on sustainability of resources for all stakeholders.

Wetlands, riverside land, steep slopes and other sites important for water management or biodiversity conservation should either be excluded from land alienation or, if included in alienated land, demarcated on the document of title, and clearance of natural vegetation prohibited. Decision-making should refer to "Environmental Management Maps" (Action A.4).

Implementing agency

LUC, DO / ACLR

Main aims / benefits

To ensure, as far as possible, that wetlands, riverside land, steep slopes and other sites important for water management or biodiversity conservation remain under natural vegetation.

Further study needed?

No.

Budget needed

None.

Timing

Starting from next LUC meeting.

**ACTION A 4 PREPARATION OF "ENVIRONMENTAL MANAGEMENT MAPS" (W)**

Work to be done

Prepare 1:50,000 scale maps demarcating wetlands, riverside land, land with slopes greater than 25<sup>0</sup> and any other environmentally-sensitive sites in the lower Kinabatangan. The notes accompanying the maps should provide criteria, and should state that demarcated areas are to be retained under natural vegetation.

Submit the maps to agencies involved in making decisions on land alienation and land use in lower Kinabatangan.

Implementing agency

MTED

Main aims / benefits

To assist agencies involved in making decisions on land alienation and land use in lower Kinabatangan.

Further study needed?

No

Budget needed

< RM1,000 (for copies of maps, colour pens etc.)

Timing

This Action should done as soon as possible, to support Actions A.2 and A.3.

## **ACTION A 5 DELINEATION OF VILLAGE LIMITS**

### Work to be done

Formal delineation, by mapping, of the villages in the lower Kinabatangan. Village limits should be shown on District plans, maps etc., which should be made available to relevant government agencies. This exercise should be done whether or not Action A.2 is implemented quickly.

### Implementing agency

TRPD

### Main aims / benefits

To assist appropriate decision-making in the process of land alienation. In particular, this Action has the joint aims of curbing speculative land applications, and of determining which lands should not be available for either (a) plantation expansion by large land-owners or (b) reservation for strict conservation purposes.

### Further study needed?

Yes. To determine historically accepted limits of houses and cultivation. To be conducted by District Office.

### Budget needed

None, other than normal government staff costs.

### Timing

As soon as possible, and before further decisions on land applications in lower Kinabatangan are made.

## **ACTION A 6 STATUTORY IMPLEMENTATION OF RIVERINE RESERVES**

### Work to be done

Preparation of a Cabinet paper to recommend that the concept of "riverine reserve" become a mandatory feature of land policy. This could be achieved by an amendment to section 26 of the Land Ordinance. For the lower Kinabatangan (and other floodplain areas) the existing minimum width of riverine reserves should be increased to 100 metres on each bank.

### Implementing agency

A working group to be formed containing DID, LSD, MTED, NRO and SAGC to prepare the Cabinet paper and decide on an appropriate channel to forward the paper to Cabinet. As the main recipient of this report, MTED should take the lead to ensure that this recommendation is initiated.

### Main aims / benefits

The main aim of this recommendation is to ensure that riverine reserves will exist and will be based on statutory obligation, rather than being the merely an option as is now the case. The main benefits of riverine reserves include:

- To minimise erosion of riverbanks.
- To help protect water quality by providing a buffer between agricultural runoff and watercourses.
- To help maintain freshwater fisheries by retaining sources of fish foods and breeding sites.
- To help maintain freshwater fisheries by maintaining appropriate water temperatures and oxygen concentrations.
- To provide continuity of habitat between sections of the wildlife sanctuary for wildlife and plant species, and to maintain genetic exchange between small populations of wild species.
- To provide habitat for riverside species such as proboscis monkeys.
- To maintain landscape quality.

### Further study needed?

No.

### Budget needed

None.

### Timing

As soon as possible. This Action is related to Actions A.2, A.3 and A.4.

**ACTION A 7 ESTABLISHMENT OF NATIVE RESERVES FOR SUPPLY OF FOREST PRODUCTS  
(W)**

Work to be done

Identification of remaining State lands in lower Kinabatangan which may be suitable for establishment as Native Reserve for supply of timber and other forest products. Possible sites include (but are not limited to) : land between Kg. Abai and wildlife sanctuary; land between Kg. Sukau and wildlife sanctuary near lower Menanggul River; Pengkalan Buaya area near Kg. Bilit; land between Kg. Sentosa Jaya and Butong lakes; land west of Butong lakes and Danau Ria area near Bukit Garam.

Dialogues with relevant village communities to propose and discuss specific sites.

If Native Reserves for supply of timber and forest products, are desired by local communities reservation of areas should be done according to the provisions of section 78 of the Land Ordinance.

If Native Reserves are established, forest rehabilitation and management plans will need to be drawn up and implemented for each Reserve. The purpose of management may include sustainable supply of timber for commercial sale. If so, funds collected by the Government for forest rehabilitation and replanting may be used for enrichment planting and replanting.

Implementing agency

Dialogues to be organised jointly by DO, MRD, SFD, SWD and MTED, and held in relevant villages or at DO.

If Native Reserves are desired, JKKK should submit proposals to DO for further action.

If management of the Reserves includes commercial timber production, SFD should have a supervisory role.

Main aims / benefits

To provide security of tenure to selected land areas so that village residents may obtain timber, deer meat and other forest products for personal and village use.

To establish some long-term timber production land in lower Kinabatangan, for the benefit of both the timber industry in general and the local villages.

Further study needed?

Yes. Identification of remaining State lands. To be conducted by DS and ACLR. Site-specific studies will be needed, by SFD or SAFODA, to determine timber production potential and details of replanting.

Budget needed

None for identification of State land and holding dialogues, other than normal government staff costs. Costs will be incurred in boundary surveys of Reserves and in forest rehabilitation work and replanting.

Timing

Dialogues to commence as soon as possible. This Action is related to Actions A.2, A.3 and A.5.

**ACTION A 8 ADOPTION OF SUITABLE NAME FOR KINABATANGAN GAME AND BIRD SANCTUARY**

Work to be done

To select a suitable administrative name for Kinabatangan wildlife sanctuary. (When the proposed Kinabatangan wildlife sanctuary is gazetted, it will be gazetted as a game and bird sanctuary according to the provisions of the Fauna Conservation Ordinance, but its name for administrative purposes should reflect the broader role of the sanctuary). A suggested name is: "Kinabatangan Heritage Forest" or "Hutan Warisan Kinabatangan".

Implementing agency

SAGC, in consultation with SWD and other agencies.

Main aims / benefits

To indicate to local communities in lower Kinabatangan that the purpose of the sanctuary is not only to protect wildlife, and to attract greater local support for the sanctuary than currently exists.

Further study needed?

No.

Budget needed

None.

Timing

At gazettelement of the sanctuary, but discussions on the name should commence immediately.

**ACTION A 9 TOURISM : PROVIDING PROTECTION FOR IMPORTANT SITES (W)**

Work to be done

Identification of sites with existing and future tourism potential which currently do not enjoy protected status. Examples of such sites include the forested limestone hill immediately north of Sukau village and the site of Pengiran Samah's resistance against the British in 1884, also at Sukau.

Provision of protected status through statutory means including : incorporation into Native Reserves, wildlife sanctuary or Forest Reserve; reservation as Archaeological Reserve under the Antiquities and Treasure Trove Enactment, 1977.

Implementing agency

District tourism committee and MTED, with assistance from village residents, SWD, NGO's, tour operators etc.

Main aims / benefits

To ensure that sites with existing and future tourism potential are given protected status.

Further study needed? Yes. Identification of sites outside Forest Reserve and wildlife sanctuary. To be conducted by "task group" under the District tourism committee.

Budget needed

Other than normal government staff costs, small budget for non-government personnel on field surveys.

Timing

As soon as possible. This Action is related to Actions A.2 and A.3.

## **ACTION A 10 ACQUISITION OF FUNDS TO IMPLEMENT RECOMMENDED ACTIONS (W)**

### Work to be done

Identification of actions that require Government funding, and submission of requests through normal Government procedures.

Identification of actions that are likely to require non-governmental sources of funds, either partially or wholly. Identification of potential sources of funds. Preparation and submission of project funding proposals.

### Implementing agency

The implementing agency for each recommended Action will be responsible for seeking Government funds. NGO's should, in consultation with the implementing agencies, be encouraged to participate in detailed formulation of follow-up projects for which they possess relevant experience and expertise, and in fund-raising for those projects. Funds may be channelled directly to NGO's for project implementation in order to minimise delays. A co-ordinating committee (Action B.1) could provide support and guidance for funding applications.

### Main aims / benefits

To ensure that recommended actions are carried out.

### Further study needed?

No.

### Budget needed

May be needed to support NGO personnel for time spent on preparation of project funding proposals.

### Timing

As soon as possible. Actions for which major new funding applications are likely to be needed include Actions B.4, B.7, B.8, B.9, B.12, B.14, B.15, C.3, C.5 and C.6.

## **B. PRIORITY ACTIONS TO BE INITIATED DURING THE FIRST HALF OF 1997**

### **ACTION B 1 CO-ORDINATING IMPLEMENTATION OF RECOMMENDATIONS**

#### Work to be done

Ensure that recommendations in this report are carried out in an integrated and co-ordinated manner.

#### Implementing agency

A committee. This may be either an existing committee (e.g. Kinabatangan District Development Committee), or a new sub-committee of an existing committee, or a new committee established especially for the purpose (e.g. chaired by MRD). Membership would include all relevant agencies.

#### Main aims / benefits

To ensure that all recommendations are acted on and that duplication of effort is minimised.

#### Timing

Starting in 1997.

#### Further study needed?

No.

#### Budget needed

None.

## **ACTION B 2 CONTROL AND MANAGEMENT OF AQUATIC RESOURCES INSIDE THE WILDLIFE SANCTUARY**

### Work to be done

Discussion involving government authorities concerned with management of freshwater resources, to outline the preferred management control within the wildlife sanctuary.

Presentation and discussion of proposed government system to local (native) users of lakes, rivers and wetlands.

Resolution and implementation of a management system. This should include a zoning and licensing system for fishing.

### Implementing agency

ACLR, DID, DO, DOE, DOF, LSD, SAGC and SWD to discuss initially. Presentation to local users must involve discussion with actual users (notably fishermen).

### Main aims / benefits

To decide on management system and authority before problems arise.

To ensure that the management system decided is both equitable and appropriate for sustainable harvesting of aquatic resources.

### Further study needed?

Only if deemed necessary during discussions.

### Budget needed

None, other than costs involved in site visits.

### Timing

As soon as possible; ideally before gazettelement of the wildlife sanctuary.

**ACTION B 3 INCORPORATION OF ENVIRONMENTAL PROTECTION MEASURES INTO DISTRICT DEVELOPMENT PLAN (W)**

Work to be done

Incorporation of "environmental management maps" (Action A.4) into the TRPD process of preparing the District Development Plan.

Incorporation of sections on environmental protection into development plans prepared by and/or for the District Office and local authorities.

Implementing agency

TRPD and DO. Assistance can be provided by MTED, DOE and relevant NGO's.

Main aims / benefits

To ensure that formal procedures for safeguarding the natural environment are incorporated, long-term, into government planning and development processes.

Further study needed?

Not essential. However, assistance on specific topics or areas may be needed from MTED and/or NGO's.

Budget needed

Not anticipated.

**ACTION B 4 CAPACITY BUILDING FOR WILDLIFE DEPARTMENT**

Work to be done

Seek sites and funds for construction of SWD staff quarters in lower Kinabatangan.  
Implementation of Actions A.2, A.7, A.8, A.9, A.10, B.2, B.5, B.6, B.7, B.8, B.10, B.12, B.13, B.14, B.15, C.4 and C.8.

Implementing agency

SWD

Main aims / benefits

To increase SWD staff capacity through on-the-job training.

Further study needed?

Yes. Further investigation of potential sites for staff quarters. To be conducted by SWD with DO.

Budget needed

For staff quarters.

## **ACTION B 5 ENFORCEMENT OF OFFENCES UNDER THE LAND ORDINANCE**

### Work to be done

Enforcement of sections 164, 165, 166, 168 and 169 of the Land Ordinance, relating to illegal occupation, logging and clearing on unalienated land, in the lower Kinabatangan.

Enforcement of section 171A. of the Land Ordinance, relating to activities on alienated land which are in breach of conditions of title, in the lower Kinabatangan.

### Implementing agency

SWD and MTED staff, or any other public servant, may report offences to a Magistrate (section 164). Officers of LSD and SAGC may prosecute (section 171B).

### Main aims / benefits

To remove plantation workers who are farming in the wildlife sanctuary.

To allow natural vegetation to regenerate on riverine reserve areas and parts of the wildlife sanctuary which have been cleared.

To provide disincentives for people to clear forest on riverine reserves and in the wildlife sanctuary.

To reduce cases of land owners clearing forest from riversides, wetlands and steep slopes.

### Further study needed?

No.

### Budget needed

Costs of prosecution. In addition to any fines imposed (up to RM5,000 for illegal occupation and up to RM10,000 for removal of natural products from unalienated land), Magistrates may order offenders to pay the value of any timber cut and any survey costs incurred (section 169).

### Timing

Starting immediately, and ongoing, whenever offences occur.

## **ACTION B 6 REDUCTION OF ILLEGAL LOGGING**

### Work to be done

Establishment of log checking station at Kg.Abai (the most appropriate site between lower Kinabatangan and log buyers). All logs without valid documentation to be confiscated and auctioned.

Investigation of the system by which logs are illegally cut, sold, transported and used.  
Cancellation of all operating licences held by illegal log buyers.

### Implementing agency

Full-time presence of SFD, SWD and PD staff working collaboratively at Kg.Abai log checking station. SFD to take the lead role in arranging and co-ordinating the checking team.

Investigation to be conducted by SFD in collaboration with relevant agencies.

### Main aims / benefits

To minimise further degradation of remaining forests in lower Kinabatangan.

To provide some stimulus for people involved in illegal supply and purchase of timber to switch to alternative sources of income before, rather than after, the remaining forests lose their capacity to regenerate.

### Further study needed?

Yes. See "Work to be done" and "Implementing agency" above.

### Budget needed

Both the log checking station and the study could be done by redeployment of existing staff.

### Timing

Initiate immediately and sustain thereafter.

## **ACTION B 7 REHABILITATION OF WILDLIFE SANCTUARY FORESTS (W)**

(see Action B.14, Tourism : Establishment of a core project)

### Work to be done

Establishment of a programme to rehabilitate the heavily degraded forests of the Sanctuary. Key elements of the programme should include:

- tending of immature wild animal food trees;
- planting important food plants, notably strangling figs;
- experimental establishment of artificial nesting holes for hornbills;
- involvement of local residents;
- use of the programme as an "ecotourism" product.

### Implementing agency

SWD with support from relevant agencies and NGO's.

### Main aims / benefits

To enhance the value of the Sanctuary for some of the rare species (e.g. orang-utan, hornbills) for which its establishment was intended.

To promote support for the Sanctuary within local communities.

### Further study needed?

Yes. To be conducted by a competent consultant or NGO. The study should be aimed at preparation of a detailed plan for initiation and implementation of the rehabilitation programme.

### Budget needed

About RM100,000 for the planning study. Based on forest enrichment planting costs elsewhere in Malaysia, RM1,000/hectare may be needed for the rehabilitation programme.

### Timing

Starting 1997, with a minimum five year time frame, to build up a long-term programme.

**ACTION B 8 ORANG UTAN CONSERVATION PROGRAMME (W)**

Work to be done

Study of the status and habitat requirements of orang-utans in the lower Kinabatangan.  
Development of an orang-utan conservation programme, involving forest rehabilitation (Action B.7), and genetic management.

Implementing agency

SWD.

Main aims / benefits

To ensure the long-term survival of the wild orang-utan population in lower Kinabatangan.

Further study needed?

Yes. Field work to be conducted by an experienced primate biologist.

Budget needed

For field study.

**ACTION B 9 VILLAGE WATER SUPPLIES (W)**

Work to be done

Study of sources, mechanism and costs, planning, installation and operation of piped, clean water supply for villages currently lacking this facility.

Implementing agency

WD. If WD is unable to conduct the study during 1997, means may be sought to request assistance from an agency outside Sabah.

Main aims / benefits

In general, the aim is to improve living conditions for village residents. There are two additional specific aims. One is to provide some assistance to those families who have received minimal benefit from the massive land use and economic changes which are now impinging on the region. Secondly, tourism development will be limited without such a water supply.

Further study needed?

Yes. See "Work to be done" and "Implementing agency" above.

Budget needed

Initially to conduct study. Costs of detailed planning, installation and operation to be estimated as part of the study.

**ACTION B 10 BUILDING LINKAGES BETWEEN SECTORS RELEVANT TO BIODIVERSITY  
CONSERVATION IN THE LOWER KINABATANGAN (W)**

Work to be done

List main sectors, including direct stakeholders (e.g. local youth), indirect stakeholders (e.g. freshwater fish buyers) and those associated with unsustainable resource use (e.g. timber buyers).

Make contacts with each sector and select representatives for future dialogue.

Arrange dialogues to discuss possible "smart partnerships" and contributions to community development by wealthier sectors. Examples for discussion may include seeking plantation sector expertise for reforestation and habitat rehabilitation.

Initiate synergistic activities which promote sustainable use of natural resources.

Implementing agency

Ideally, an NGO working with MRD, DO and also SWD.

Main aims / benefits

To promote synergy between sectors involved in activities which favour sustainable use of natural resources.

To promote phasing out of activities which involve unsustainable use of natural resources.

Further study needed?

No.

Budget needed

To employ NGO staff.

**ACTION B 11 TOURISM : FORMULATION AND USE OF A POLICY AND PLAN FOR LOWER KINABATANGAN (W)**

Work to be done

Formulation of general policies and a plan for future tourism development in lower Kinabatangan. This should ideally be in the form of a written document.

Implementing agency

District Development Committee, advised by a sub-committee on tourism, which in turn will receive input from the main stakeholders.

Main aims / benefits

To provide a guide for government decision-making and implementation of other Actions relating to tourism in lower Kinabatangan.

Further study needed?

Yes. To be conducted by a tourism sub-committee of the District Development Committee.

Budget needed

Other than normal government staff costs, small budget for non-government personnel on field surveys.

## **ACTION B 12 TOURISM: DEVELOPMENT OF FACILITIES AND INFORMATION (W)**

### Work to be done

Preparation and use of written guidelines for "best practices" for tourism at lower Kinabatangan, to be used by local authorities and by operators.

Development of more visitor accommodation, giving emphasis to (a) sites other than Sukau, (b) "walk-in" tourists, (c) domestic tourists, and (d) forest camps.

Installation of treated piped water supply at Sukau and Batu Putih. Local treatment of ground water should be considered.

Production of printed information on lower Kinabatangan (booklets, leaflets etc.) and distribution (e.g. through MTPB offices, STPC offices, hotels, villagers etc.).

Provision of sign boards to assist visitors in villages.

Preparation and implementation of a marketing strategy for lower Kinabatangan, with some emphasis on walk-in tourists and domestic market.

### Implementing agency

DO, MOCAT, MRD, MTED, STPC, SWD, NGO's and others. Further discussion between these and other agencies is needed to more clearly define roles and responsibilities.

### Main aims / benefits

To increase the number and the range of appropriate tourism products available, thereby increasing and spreading potential income-generating opportunities for local residents.

### Further study needed?

None for the general work outlined above.

### Budget needed

For : staff to promote the listed activities; sign boards; preparation, printing and distribution of literature.

**ACTION B 13 TOURISM: ASSISTANCE TO LOCAL ENTREPRENEURS (W)**

Work to be done

Guidance / advice for individuals / groups wishing to start / develop businesses relating to tourism. Proposals are included in the Appendix on the Tourism Survey.

Implementing agency

DO, MOCAT, MRDE, MRD, MTED, STPC, SWD, NGO's and others. Further discussion between these and other agencies is needed to more clearly define roles and responsibilities.

Main aims / benefits

To ensure that local entrepreneurs are able to establish tourism-related businesses in lower Kinabatangan. These should act as models and catalysts for other local residents.

Further study needed?

Yes. To establish roles and responsibilities of the various government agencies. MRD or MRDE might take a lead role in facilitating discussion and decision-making.

Budget needed

For staff to work on site with local entrepreneurs. Volunteers (Malaysian or foreign) may be appropriate in some circumstances.

**ACTION B 14 TOURISM: ESTABLISHMENT OF A CORE PROJECT (W)**

(see Action B.7, Rehabilitation of wildlife sanctuary forests)

Work to be done

Implement Action B.7, Rehabilitation of wildlife sanctuary forests. This is identified as the most appropriate core tourism development project for lower Kinabatangan.

Implementing agency

SWD with support from relevant agencies and NGO's.

Main aims / benefits

To provide sources of income to local residents (from being involved in tending, nurseries, planting, tourism etc.).

To provide a new "ecotourism" product, through involving tourists in the rehabilitation programme.

To provide avenues for development of other tourism products by local residents.

Further study needed?

Yes. To be conducted by a competent consultant or NGO. The study should be aimed at preparation of a detailed plan for initiation and implementation of the rehabilitation programme.

Budget needed

About RM100,000 for the planning study. Based on forest enrichment planting costs elsewhere in Malaysia, RM1,000/hectare may be needed for the rehabilitation programme.

**ACTION B 15 ESTABLISHMENT OF PROGRAMME TO SUPPORT SELECTED ECONOMIC ACTIVITIES IN VILLAGES**

Work to be done

Identification of individuals and families interested in certain economic activities suggested during socio-economic and fisheries surveys in 1996. The activities may include: (a) deer farming, (b) crocodile farming, (c) aquaculture (cage aquaculture is likely to be preferable to pond aquaculture, based on cost and on flood risk), (d) assistance in marketing fish and prawns, perhaps through a co-operative, (e) tree farms, (f) furniture manufacture, and (g) handicraft manufacture.

Relevant government agencies to co-ordinate, advise on and extend support to the activities.

Co-ordinating / advisory /supporting agencies

- (a) and (b) : SWD
- (c) and (d) : DOF or Ko-Nelayan
- (e) : SFD or SAFODA
- (f) and (g) : MRDE

Main aims / benefits

To provide alternative sources of income for people who have previously relied on exploitation of natural resources which are now depleted and who are unable to embark on more traditional sustainable activities or on activities which require new skills.

Further study needed?

Possibly. The relevant government agencies may need to conduct further study into the ways in which they can initiate and sustain necessary assistance to villagers.

Budget needed

Yes. To be determined by relevant government agencies.

## **C. ACTIONS THAT MAY BE INITIATED AT ANY TIME**

### **ACTION C 1 PROCESSING LAND APPLICATIONS FROM VILLAGE RESIDENTS**

#### Work to be done

Determination of criteria for deciding which land applications in lower Kinabatangan submitted by local residents should be (a) approved and (b) processed as a matter of priority. Criteria should focus on whether or not the applicant is resident, whether he/she already owns land, whether he/she has previously applied for and sold land, evidence of need for land, evidence of use of land applied for, and date of land application.

Based on the selected criteria, valid land applications should be processed as quickly as possible.

For land applied under N.T., Government should ensure that boundary surveys are done as soon as possible.

#### Implementing agency

LSD/ACLR/DS

#### Main aims / benefits

To ensure that genuine land applicants acquire security of tenure for land.

To promote support for biodiversity conservation amongst people who feel that the wildlife sanctuary is taking away their land.

#### Further study needed?

Yes. Determination and use of criteria for selecting genuine land applicants. To be conducted by LSD in collaboration with DO.

#### Budget needed

For boundary surveys for N.T. land applications.

**ACTION C 2 STUDY OF UNDER-UTILISED LAND (W)**

Work to be done

Study of under-utilised smallholder land (N.T. and C.L.) in the lower Kinabatangan, to identify the location and extent of such land and the reasons why it has not be utilised.

Implementing agency

LSD in collaboration with other relevant agencies.

Main aims / benefits

To provide a basis for determining what assistance may be needed from Government for local residents who feel that the wildlife sanctuary is taking away their land.

To assist in the formulation of future land policy, especially in relation to conservation of wetlands, riverside land and steep land.

Further study needed?

Yes. Study of under-utilised smallholder land (N.T. and C.L.) in the lower Kinabatangan. To be conducted by LSD in collaboration with other relevant agencies.

Budget needed

Yes, to be determined by LSD.

### **ACTION C 3 RIVER POLLUTION CONTROL**

#### Work to be done

Prepare a programme for monitoring and control of river pollution in lower Kinabatangan. The programme must include elements of prevention (i.e. implementation of Actions A.2, A.3, A.4, A.5, A.6, A.7, A.9, B.1, B.2, B.3, B.5, B.6, B.7, B.9, B.10, C.6 and C.8) and cure (i.e. enforcement of offences under the Environmental Quality Act 1974, Fisheries Act 1985, Land Ordinance 1930, and other relevant State legislation).

The programme can help towards an eventual reduction in concentrations of suspended solids in the Kinabatangan River by supporting mandatory implementation of reduced impact logging techniques in the upper catchment areas.

#### Implementing agency

MTED with collaboration of relevant agencies.

#### Main aims / benefits

To maintain water quality in water courses and lakes of lower Kinabatangan, to a level sufficient that freshwater fisheries are not affected by pollution.

#### Further study needed?

Yes. Acquisition of all existing relevant data. To be conducted by MTED.

#### Budget needed

None, other than normal government staff costs.

#### **ACTION C 4 ELEPHANT MANAGEMENT**

Work to be done

Establish Government policy on the extent and location of land to be retained under forest, long-term, in lower Kinabatangan.

Based on that, decide whether to manage elephants in situ in lower Kinabatangan or to remove them. Removal may be done by translocation of live animals to other forest areas (if suitable forest areas exist) or by culling.

Implementing agency

SWD

Main aims / benefits

To determine the appropriate management strategy for elephants in lower Kinabatangan.

Further study needed?

No.

Budget needed

Depends on management strategy.

**ACTION C 5 ESTABLISHMENT OF A PROCESSED FOOD INDUSTRY BASED ON WOMAN'S GROUP (W)**

Work to be done

Identification of women's groups interested in establishing a processed food industry.

Identification of food items based on locally produced ingredients (e.g. banana, tapioca, fish, prawns, chilly), which can be manufactured locally

Preparation of a plan to provide necessary support (e.g. packaging, marketing).

Co-ordinating / supporting agency

To be identified.

Main aims / benefits

To provide alternative sources of income for families which have previously relied on exploitation of natural resources which are now depleted.

To build on the interest of women in embarking on new economic activities.

Further study needed?

Possibly. The Co-ordinating / supporting agency may need to conduct further study into the ways in which they can initiate and sustain necessary support.

Budget needed

Yes. To be determined by the Co-ordinating / supporting agency.

**ACTION C 6 STUDY OF LAND PREMIUMS AND RENTS**

Work to be done

A State-wide study of current levels of land premiums and rents is recommended. This will have special applicability to lower Kinabatangan.

Implementing agency

NRO / SDD

Main aims / benefits

To increase State revenue from land utilisation.

To provide a means by which the oil palm industry can contribute more equitably to Sabah's economy.

To eliminate current incentives for wetlands, steep slopes and other environmentally sensitive areas to be converted to agriculture.

Further study needed?

Yes. To be arranged by the implementing agencies.

Budget needed

Yes. To be determined by the implementing agencies.

## **ACTION C 7 PROMOTING SMALL-HOLDER DEVELOPMENT OF OIL PALM**

### Work to be done

A study of the ways in which small-holders in lower Kinabatangan may develop oil palm plantations. This should involve a thorough review of the roles that may be played by such agencies as BPM, FELCRA, KPD, PORIM etc. A key focus of this study should be to identify clearly one or more practical ways in which groups of small-holders might collaborate to apply for credit or loans. The study should also be aware that promoting oil palm small-holdings will be provide net benefits to the community in general only if harvesting is likely to be done by land-owners, so that emphasis should be on planting near existing villages.

Following the study, the ways open to local small-holders to develop oil palm should be presented through village dialogues.

### Implementing agency

To be determined. Ideally one Government agency should take on this role. Alternatively, an NGO could be asked to conduct the study as part of overall efforts towards sustainable development.

### Main aims / benefits

To assist interested village residents to embark on developing a long-term source of regular income.

### Further study needed?

Yes. See "Work to be done" and "Implementing agency" above.

### Budget needed

Small budget to support main investigator for 1 month.

**ACTION C 8 CONSIDER KINABATANGAN FLOODPLAIN TO BE PROPOSED AS A WETLAND OF INTERNATIONAL IMPORTANCE UNDER THE RAMSAR CONSERVATION (W)**

Work to be done

Prepare a paper outlining benefits and disadvantages of nominating lower Kinabatangan as a wetland of international importance under the RAMSAR Convention (which concerns management of wetlands).

Consultation amongst relevant State Government agencies.

Implementing agency

SWD / MTED

Main aims / benefits

To determine whether or not a formal proposal to nominate lower Kinabatangan should be submitted.

If the proposal is submitted, to attract wider support for research, funding and sustainable tourism development in lower Kinabatangan.

Further study needed?

Yes. To compile and evaluate existing information. To be conducted under the guidance of MTED.

Budget needed

Small budget to collate data and prepare paper.