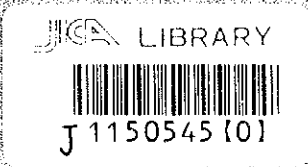


JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
NATIONAL DEVELOPMENT PLANNING AGENCY (BAPPENAS)
THE GOVERNMENT OF REPUBLIC OF INDONESIA

**THE DEVELOPMENT STUDY ON COMPREHENSIVE
REGIONAL DEVELOPMENT PLAN FOR
THE WESTERN PART OF KALIMANTAN
SCRDP-KALTENGBAR**

FINAL REPORT

**VOL.3
PRIORITY PROJECT PROFILES**



MARCH 1999

**PACIFIC CONSULTANTS INTERNATIONAL
INTERNATIONAL DEVELOPMENT CENTER OF JAPAN**

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The exchange rates applied in this study are:

| MONTH | Rupiah/US\$ |
|----------------|-------------|
| March-1997 | 2,399 |
| April-1997 | 2,412 |
| May-1997 | 2,434 |
| June-1997 | 2,428 |
| July-1997 | 2,509 |
| August-1997 | 2,735 |
| September-1997 | 2,994 |
| October-1997 | 3,566 |
| November-1997 | 3,448 |
| December-1997 | 4,798 |
| January-1998 | 9,743 |
| February-1998 | 9,045 |
| March-1998 | 9,536 |
| April-1998 | 8,057 |
| May-1998 | 10,079 |
| June-1998 | 13,532 |
| July-1998 | 13,996 |
| August-1998 | 12,127 |
| September-1998 | 11,033 |
| October-1998 | 8,567 |
| November-1998 | 7,785 |
| December-1998 | 7,630 |
| January-1999 | 7,978 |

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ABBREVIATION AND GLOSSARY

| | |
|------------------|---|
| Adat | Customary law |
| ADB | Asian Development Bank |
| AIDA | Australia Indonesia Development Area |
| Alang-alang | Imperata cylindrica grassland |
| AFTA | ASEAN Free Trade Area |
| APBD | Anggaran Pendapatan dan Belanja Daerah, Provincial or district Budget |
| APBN | Anggaran Pendapatan dan Belanja Negara, National Budget |
| APPKD | Anggaran Penerimaan dan Pengeluaran Kas desa, Village Budget |
| ASEAN | Association of South East Asia Nations |
| Bangda | Direktorat Jenderal Pembangunan Daerah (Directorate General for Regional Development, Ministry of Home Affairs) |
| Bangdes | Direktorat Jenderal Pembangunan Desa (Directorate General for Village Development, Ministry of Home Affairs) |
| Bappenas | Badan Perencanaan Pembangunan Nasional (National Development Planning Agency, Indonesia) |
| Bappeda | Badan Perencanaan Pembangunan Daerah (Regional Development Planning Agency) |
| BIMP-EAGA | Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area |
| BKKBN | Badan Koordinasi Keluarga Berencana Nasional (National Family Planning Coordinating Board) |
| BKPM | Badan Koordinasi Penanaman Modal (Capital Investment Coordinating Board) |
| BPN | Badan Pertanahan Nasional (National Board of Land Affairs) |
| BPS | Biro Pusat Statistik (Central Bureau of Statistics, Indonesia) |
| BRI | Bank Rakyat Indonesia (Indonesian People's Bank) |
| Bulog | Badan Urusan Logistik (State Logistics Board with special responsibility for food procurement) |
| Bupati | Administrative head of a district (kabupaten) |
| Camat | Administrative head of a subdistrict (kecamatan) |
| Cipta Karya | Directorate General of Human Settlements, Ministry of Public Works |
| CPO | Crude Palm Oil |
| Crude Birth Rate | The annual number of births per 1,000 persons |
| Damar | Resin |
| Desa | Administrative village |
| Dinas | Office of Provincial Government |
| DPR | Dewan Perwakilan Rakyat (House of People's Representatives) |
| DPRD | Dewan Perwakilan Rakyat Daerah (Regional House of People's Representatives) |
| Dusun | Subvillage, hamlet (part of desa) |
| EPI | Expanded Program of Immunization |

| | |
|--------------------|---|
| GBHN | Garis-garis Besar Haluan Negara (Broad Guidelines for State Policy) |
| GDP | Gross Domestic Product |
| GNP | Gross National Product |
| GRDP | Gross Regional Domestic Product |
| GTZ | Gesellschaft fur Technische Zusammenarbeit (German Agency for Technical Cooperation) |
| HPH | Hak Pengusahaan Hutan (Timber Concession) |
| HTI | Hutan Tanaman Industri (Industrial Tree Plantation) |
| IDT | Inpres Desa Tertinggal (Backward Village Program) |
| IMF | International Monetary Fund |
| Inpres | Instruksi Presiden (Presidential Instruction, a program of special grants from the central government) |
| Inpres program | Central government subsidies to regional government (province, kabupaten and villages) for various kinds of infrastructure development and for the construction of primary schools and health centers |
| IPK | Izin Pemanfaatan Kayu (Wood Utilization Permit) |
| JICA | Japan International Cooperation Agency |
| Kabupaten | District or regency, administrative unit below the province |
| KADIN | Kamar Dagan dan Industri Indonesia (Chamber of Commerce and Industry) |
| Kampung | Hamlet, traditional settlement unit in parts of Kalimantan |
| Kantor dinas | Department under provincial governor's office |
| Kanwil | Kantor Wilayah (Regional Office, a line regional agency of a ministry) |
| Kebun karet rakyat | Rubber grove established by farmers, or so-called jungle rubber grove |
| Kecamatan | Subdistrict, administrative unit below the district (kabupaten) |
| Kelurahan | Urban village |
| Kepala desa | Village head |
| KUD | Koperasi Unit Desa (Village Unit Cooperative) |
| Kukesra | Kredit Usaha Keluarga Sejahtera (small-business credit component for Family Prosperity Development Program) |
| Ladang | Dry field |
| LKMD | Lembaga Ketahanan Masyarakat Desa (Village Community Development Institution) |
| LMD | Lembaga Musyawarah Desa (Village Council) |
| LNG | Liquid Natural Gas |
| NES | Nucleus Estate and Smallholder's integration scheme |
| NGO | Non Government Organization |
| Paduserasi | Synchronization procedure of provincial landuse plans. |
| Pancasila | Five philosophical principals that constitute the official national ideology |
| Pasar | Market place |
| PBB | Pajak Bumi dan Bangunan (land and building tax which has replaced the old lan tax, Ipeda) |
| PCM | Project Cycle Management, an objectis-oriented planning method adopted by JICA, a similar method to ZOPP |
| PIR | Perkebunan Inti Rakyat (nucleus-smallholders plantation scheme) |

| | |
|------------------------|--|
| PJP II | Pembangunan Jangka Panjang II (Second Long-Term Development, 1994-2019) |
| PKK | Pembinaan Kesejahteraan Keluarga (Family Welfare Education Movement) |
| Posyandu/Pelayanan | Pos Terpadu (Integrated Health Service Delivery Post), a once a month health care center which provides maternal and child health, as well as family planning services |
| PMD | Pembangunan Masyarakat Desa (former Bangdes), Directorate for Community Development, Ministry of Home Affairs |
| Prokasih | Program Kali Bersih (Clean river program for urban rivers) |
| PT | Perseroan Terbatas (limited liability company) |
| PTP | Perseroan Terbatas Perkebunan (limited liability estate company) |
| Puskesmas | Pusat Kesehatan Masyarakat (subdistrict Health Center) |
| P5D | Pedoman Penyusunan Perencanaan dan Pengendalian Pembangunan Daerah, 1982 regulation on bottom-up planning |
| Rakorbang | Rapat Koordinasi Pembangunan (development planning coordination meeting) |
| Repelita | Rencana Pembangunan Lima Tahun (National Five-year Development Plan) |
| Repelitada | Rencana Pembangunan Lima Tahun Daerah (Regional Five-year Development Plan) |
| RePPPProT | Regional Physical Planning Project for Transmigration |
| SALCRA | Sarawak Land Consolidation and Rehabilitation Authority |
| Sawah | Irrigated rice field |
| Sakernas | Survei angkatan Kerja Nasional (National Labor force Survey) |
| SCRDP-Kaltengbar | JICA Study Project, Development Study on Comprehensive Regional Development Plan for the Western Part of Kalimantan covering West Kalimantan (Kalbar) and Central Kalimantan (Kalteng) |
| SIJORI growth triangle | Singapore-Johor-Riau growth triangle |
| SME | Small and Medium Enterprise |
| SSE | Small Scale Enterprise |
| Susenas | Survei Sosial Ekonomi Nasional (National Socioeconomic Survey) |
| Swidden agriculture | Indigenous people's cyclic agriculture, shifting cultivation or slash and burn agriculture |
| Takesra | Tabungan Keluarga Sejahtera (saving mobilization component of Family Prosperity Development Program) |
| TGHK | Tata Guna Hutan Kesepakatan (Consensus Forest Landuse) |
| TPTI | Tebang Pilih dan Tanam Indonesia (Indonesian Selective Logging and Planting System) |
| UNDP | United Nations Development Program |
| USAID | United States Agency for International Development |
| ZOPP | Ziel-Orientierte Projekt-Plaunung (Objective-Oriented Project Planning), ZOPP planning technique, the GTZ's official project planning system |

CHAPTER 1

INTRODUCTION

CHAPTER 1 INTRODUCTION

Among twenty one (21) recommended programs, an evaluation was made to select nine (9) priority projects for immediate actions, taking into account the criteria of 1) seeking to be a self-sustaining region, 2) creation of a better business environment to attain steady economic growth, 3) promotion of economic diversification, 4) empowerment of local communities, and 5) support for environmental conservation.

The following criteria is adopted for selecting the priority projects:

| | Selection Criteria | Selected Projects |
|---|--|--|
| 1 | Seeking to be a self-sustaining region | All the priority projects |
| 2 | Creation of a better business environment to attain steady economic growth | Chapter 3: Oil Palm Subsector Improvement Project Chapter 4: The Tayan-Pangkalanbun Section of the Trans-Kalimantan Highway Project Chapter 5: Upland Ecological Development Corridor Project in Central Kalimantan Chapter 6: Pangkalanbun-Kumai Urban, Industrial and Port Development Project |
| 3 | Empowerment of local communities | Chapter 7: Upland Rural Infrastructure Development Project Chapter 8: Kalimantan Upland Community Rescue and Development Project Chapter 9: Kalimantan SME Promotion Project |
| 4 | Support for environmental conservation | Chapter 2: Kalimantan Forest and Land Fire Disaster Management Project Chapter 5: Upland Ecological Development Corridor Project in Central Kalimantan Chapter 10: Development of a Research Station and Field Centers in the Upstream Kapuas for the Kalimantan System Basic and Applied Research Institute |

The profiles of the priority projects are presented in this volume. Some are planning study projects, and some are pilot projects for implementation. The profiles for study projects can be read as Terms of Reference of the project.

CHAPTER 2

MASTER PLANNING STUDY FOR FOREST AND LAND FIRE DISASTER MANAGEMENT IN WEST KALIMANTAN

CHAPTER 2 MASTER PLANNING STUDY FOR FOREST AND LAND FIRE DISASTER MANAGEMENT IN WEST KALIMANTAN

2.1 GENERAL

This chapter is about a recommended priority project (planning study project), which is one of the projects constituting "Kalimantan Forest and Land Fire Disaster Management", of which the outline is given in Chapter 8 of Volume 2 (The Main Text) of the Final Report.

This chapter is prepared to be utilized as the Terms of Reference for the study project.

2.2 BACKGROUND AND RATIONALE OF THE PROJECT

2.2.1 The Region in Transition

The forest and land fires in 1997 helped to change our views on forest and land fires in Kalimantan and other areas. In 1982 East Kalimantan's lowland forests were hit by serious forest and land fires. In that case, it was considered that the forest and land fires were caused by heavy logging operations and long drought due to El Nino. On the other hand, in addition to that long drought, the 1997 forest and land fires in West and Central Kalimantan were associated with land development practices for plantation development (both oil palm and industrial trees). Moreover, in 1997, wide areas of peat swamp forests caught fire and produced a huge amount of smoke.

Since the middle of 1980s, West and Central Kalimantan have been in the a transition in terms of economy and landuse, influenced by road development as well as oil palm and pulp wood plantation development. Timber production by logging operations has decreased gradually due to rapid timber resource depletion. In the future, more plantations are expected to be developed in Kalimantan, so that the possibility of forest and land fires becomes higher.

Road development connecting downstream towns with upland areas is an inevitable direction of regional development. However, since the downstream towns are located in the midst of peat swamp areas, road development tends to provide access to swamp forest areas, resulting in the deterioration of swamp forest areas along the roads. This has resulted in fires of peat soils of

the swamp areas along the roads. Since the accumulated peat in the swamp areas of Kalimantan is huge, peat swamp forest and land fires are considered to be chronic.

2.2.2 Forest and Land Fires : a Disaster to Regional Environment and Local Communities

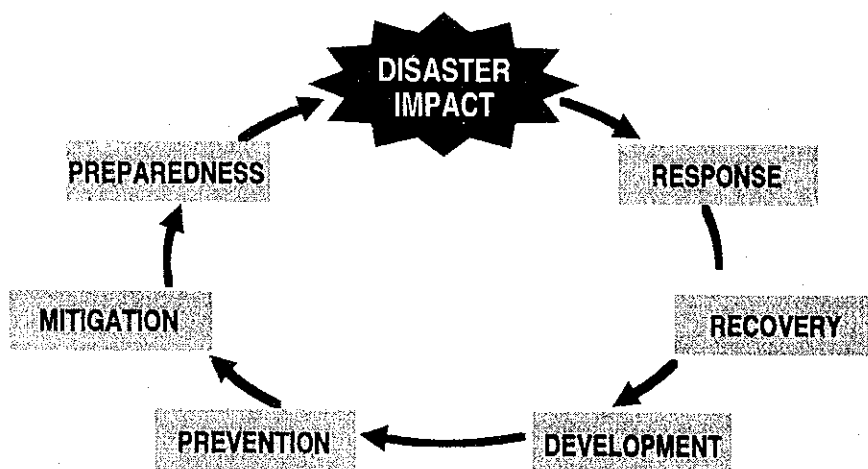
Under the unstable global climate, now it is considered that the 1997 forest and land fires in Sumatra and Kalimantan were not a single incident, but that such region-wide forest and land fires tend to be repeated at intervals of several years. On the other hand, the 1997 forest and land fires brought huge disastrous damages not only to natural forests and plantation crops but also to business operations, people's livelihoods and people's health in the region.

In these senses, forest and land fires of this kind are regarded as disasters. Therefore, the necessary measures against such forest and land fires can be formulated more effectively when those measures are considered as disaster management, covering various disaster events from disaster impact, response, recovery, development, prevention, and mitigation, to preparedness.

2.2.3 Implication of Forest and Land Fires: the Need for Long-Term and Comprehensive Disaster Management

Forest and land fire prevention is only part of the necessary actions and measures for forest and land fire disaster management. Forest and land fire disaster management requires a variety of efforts ranging from short-term actions to long-term efforts against forest and land fires, covering not only those in the forestry sector but also those in the sectors of plantation, landuse, village development and education.

Figure 2.1 Cycle of Disaster Management



Source: Taken from ADB (1991) Disaster Management : A Disaster Manager's Handbook

2.3 IMPLEMENTING AGENCIES

The implementing agencies of the study project at the central government level should be a coordinating agency for disaster management, not only for forest and land fires but also for other types of disasters. The ministry of forestry should be a member of technical committee for the project. The counterpart agencies at the local government level should be the provincial Bappeda and the provincial forest agency (Dinas Kehutanan) or regional forestry office (Kanwil Kehutanan).

2.4 OBJECTIVES OF THE PROJECT

- To conduct a post-disaster review of the last forest and land fires
- To prepare a master plan for comprehensive forest fire disaster management for the long-term (20 years)
- To formulate priority projects to constitute a long-term masterplan

2.5 STUDY AREA

The study covers the whole area of the West Kalimantan Province (about 150,000 km²).

2.6 SCOPE OF WORK

The study is composed of the following three phases:

- Phase 1: Data Collection and Analysis of a Wide-Range of Forest-Fire Related Aspects
- Phase 2: Master Planning for Forest Fire Disaster Management
- Phase 3: Formulation of Priority Projects to Support the Master Plan for Forest Fire Disaster Management

The tasks in each of these phases are as follows:

2.6.1 Phase 1: Data Collection and Analysis of a Wide-Range of Forest-Fire Related Aspects

[Task 1] Data collection and analysis of forest and land fires

- Analysis of hot spot data and Himawari-Satellite images to get the information of forest and land fires incidents
- Remote sensing data analysis to examine landuse situations at that time
- Other data on development activities such as oil palm and industrial tree plantation development
- Overlapping analysis of fire incidences and landuse to understand possible direct causes of forest and land fires

[Task 2] Data collection and analysis of environmental impacts of forest and land fires

- Case studies on environmental impacts of the forest and land fires in 1997 (by sub-contracting to local researchers)

[Task 3] Data collection on social and economic situations under forest and land fires in 1997

- Case studies to understand the social and economic situations in the areas which suffered forest and land fires, paying attention to the problems of rural livelihood and urban activities (by sub-contracting to local researchers and NGOs)

[Task 4] Information collection on actual institutional Actions for the forest and land fires in 1997

This information collection is to be done at the following different levels:

- At the central government level
- At the provincial government level
- At the district government level
- At the local community level

[Task 5] Risk assessment

The risks of forest fire incidents in the future are to be assessed.

[Task 6] Hazard assessment

The methodology of hazard assessment of forest and land fires in West Kalimantan is to be established, and using this methodology, a hazard map of forest and land fires is to be made.

[Task 7] Vulnerability analyses

The following three kinds of vulnerability are to be assessed:

- Physical and environmental vulnerability (not only forests but also other environmental aspects, such as water and soils)
- Social vulnerability (paying attention to local communities)
- Economic vulnerability (covering both businesses and livelihood)

2.6.2 Phase 2: Master Planning for Forest Fire Disaster Management

[Task 8] Identification of issues concerning forest and land fires disaster

[Task 9] Identification of constraints for taking actions for forest fire disaster management

[Task 10] Analysis of availability of resources (financial, human and others) to forest fire disaster management

[Task 11] Setting of goals for forest fire disaster management

[Task 12] Formulation of frameworks and basic strategies for forest fire disaster management

- Framework and basic strategies for forest management
- Framework and basic strategies for mangement of other environmental aspects
- Framework and basic strategies for social development
- Framework and basic strategies for institutional management

[Task 13] Plan formulation of a cycle of actions for forest fire disaster management

The following cycle of actions are to be planned:

- Response
- Recovery
- Development
- Prevention
- Mitigation
- Preparedness

[Task 14] Formulation of action plans for preparedness

In the above cycle of actions, the most essential part is considered to be the improvement of preparedness of forest-fire related aspects, including forest management, landuse management and social development. Therefore, a detailed plan of action for improving preparedness is needed. Some examples of such actions for preparedness are as follows:

- Establishment of an institutional mechanism for maintaining and updating the forest fire disaster management plan
- Establishment of priorities for fire fighting (for example, which forests are to be protected from forest and land fires must be decided beforehand)
- Establishment of guidelines for actions (from government agencies to community groups) in the response stage
- Regular exercises for actions in the response stage
- Implementing special measures for reducing social vulnerability by social development programs covering the aspects of people's health, food supply and other needs
- Implementing special measures for improving physical vulnerability of landuses (by preparing a fire-resistant landuse plan and creating fire-resistant landuses)

Phase 3: Formulation of Priority Projects

[Task 15] Formulation of a Long List of Projects

[Task 16] Selection of Priority Projects

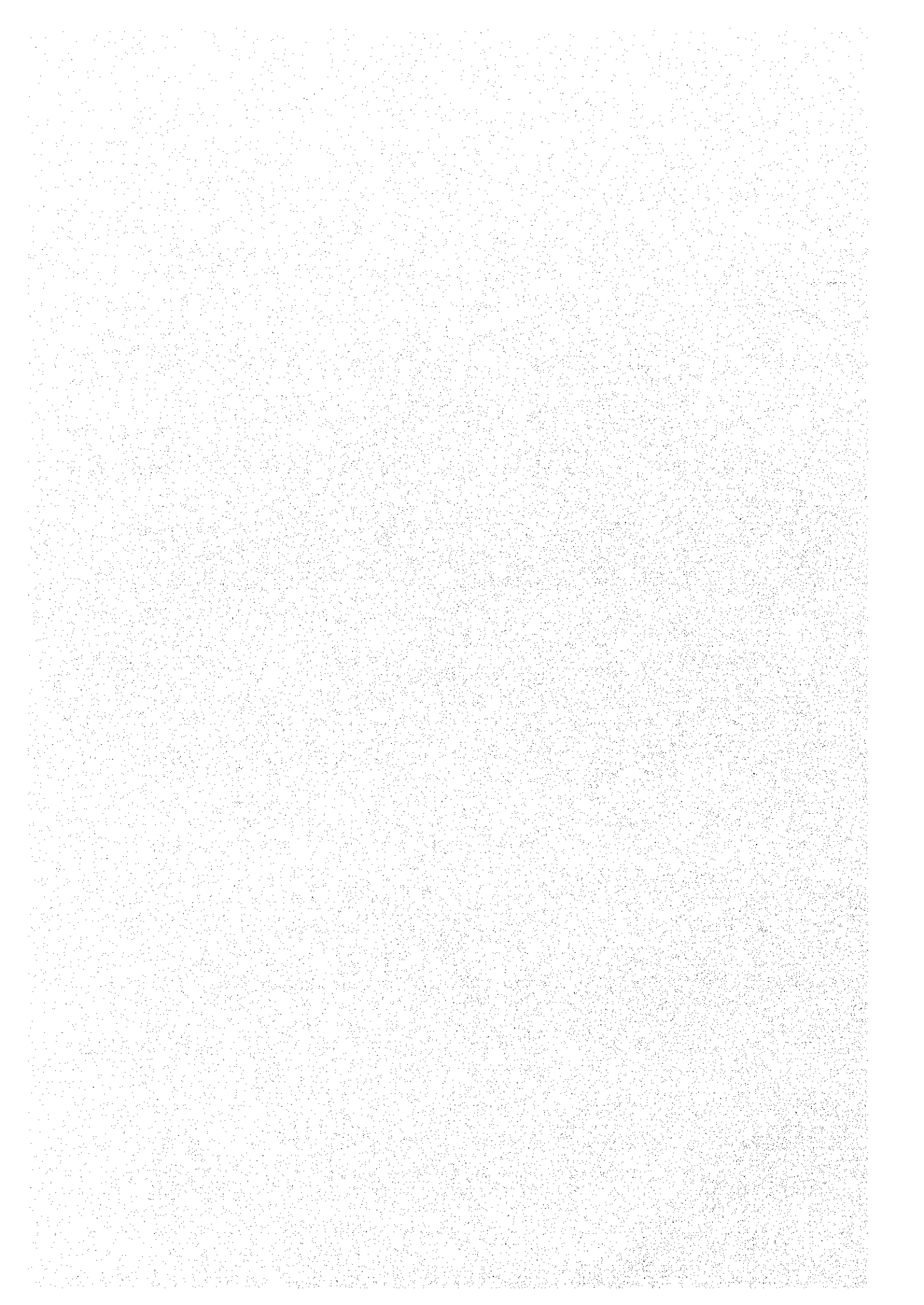
[Task 17] Preparation of Priority Project Profiles

2.7 NECESSARY INPUTS OF EXPATRIATE EXPERTS

| | |
|--|------------------|
| Key assignments | |
| Team leader/ landuse and natural resource management planner | 12 person-months |
| Social development planner/ sociologist | 10 person-months |
| Hazard assessment specialist | 8 person-months |
| Forest management | 8 person-months |
| Institutional specialist | 8 person-months |
| Environmental specialist | 6 person-months |
| Remote sensing specialist | 6 person-months |
| GIS specialist | 6 person-months |
| Sub total of key assignments | 64 person-months |
| Other assignments | |
| Social forestry specialist | 6 person-months |
| Forest industry specialist | 6 person-months |
| Agriculture and agroforestry specialist | 8 person-months |
| Nature conservation specialist | 6 person-months |
| Health specialist | 6 person-months |
| Infrastructure specialist | 6 person-months |
| Regional economist | 6 person-months |
| Project economic analysts | 4 person-months |
| Sub total of other assignments | |
| Total m/m | 112 m/m |

CHAPTER 3

PLANNING STUDY FOR OIL PALM SUBSECTOR IMPROVEMENT IN KALIMANTAN



CHAPTER 3 PLANNING STUDY FOR OIL PALM SUBSECTOR IMPROVEMENT IN KALIMANTAN

3.1 INTRODUCTION

This chapter is about a recommended priority project (planning study project), which is one of the projects constituting "Kalimantan Oil Palm Subsector Improvement Program", of which the outline is given in Chapter 8 of Volume 2 (The Main Text) of the Final Report.

The planning study project consists of the following three components:

- 1) Component A: Study on measures for improving business environment of the oil palm industry
- 2) Component B: Study on models of cooperative-based oil palm plantation development, and
- 3) Component C: Study on community-based participatory landuse planning schemes
- 4) Component D: Study on assistance systems for smallholder oil palm plantation development

These study components are to study and design alternative concrete measures to implement policy changes, which are based on the recommendations made by JICA's regional planning study, JICA-SCRDP-Kaltengbar.

3.2 BACKGROUND: OIL PALM SUBSECTOR IN WEST AND CENTRAL KALIMANTAN

The oil palm subsector has been emerging as a key subsector in the economic development of West Kalimantan and has been followed by Central Kalimantan. The oil palm subsector is composed of oil palm plantations (companies' nucleus estates and smallholders' plots), crude palm oil production plants and furthermore, downstream industries of utilizing crude palm oil.

At present, in both West and Central Kalimantan, oil palm plantations and crude palm oil production account for a major part of the oil palm subsector. Little has been done for the downstream industries.

One of the major issues in the economic development of West and Central Kalimantan is how to offset the expected huge decrease of value added by plywood and other wood processing industries. At present, the forestry and wood processing industry account for 21% of GRDP in West Kalimantan, and 35% of the GRDP in Central Kalimantan.

Table 3.1 Profile of the Existing Oil Palm Subsector in 1996

| | Area Planted (1,000 ha) | % of Indonesia's Total Area Planted | CPO Production (1,000 ton) | % of Indonesia's Total CPO Production |
|--------------------|----------------------------|--|-------------------------------|---|
| West Kalimantan | 211 | 10% | 205 | 4% |
| Central Kalimantan | 90 | 4% | 12 | 0.2% |
| Sumatra | 1,783 | 80% | 4,507 | 91% |
| Indonesia Total | 2,227 | 100% | 4,960 | 100% |
| Malaysia | 2,161* | - | 8,060 | - |

Source: Directorate General of Estate, Ministry of Agriculture, Statistik Perkebunan Indonesia 1995-1997, 1997
 ISTA Mielk GMBH, Oil World April 1996

Mari #. Pangestu and Yuri Sato eds. (1997), Waves of Change in Indonesia's Manufacturing Sector, 1997

Note: *: Mature Area in 1995

In 1996 the area planted with oil palms reached 209,000 ha in West Kalimantan, and 90,000 ha in Central Kalimantan.

As of late 1997, the provincial government of West Kalimantan had offered as much as 3.2 million ha for tree crop plantation development. In the offered area, lands with the approval of Director General of Estate, the Ministry of Agriculture (ijin prinsip) amount to 1.6 million, which includes areas for other tree crops but is allocated mainly, more than 90%, for oil palm.

In Central Kalimantan, the lands with the approval of Director General of Estate, the Ministry of Agriculture totals 1,712,412 ha, slightly over but almost equal to the 1.7 million ha allocated by the 1992 provincial spatial plan (RTRWP) for tree crop plantation, of which 1,557,752 ha is approved for oil palm plantation.

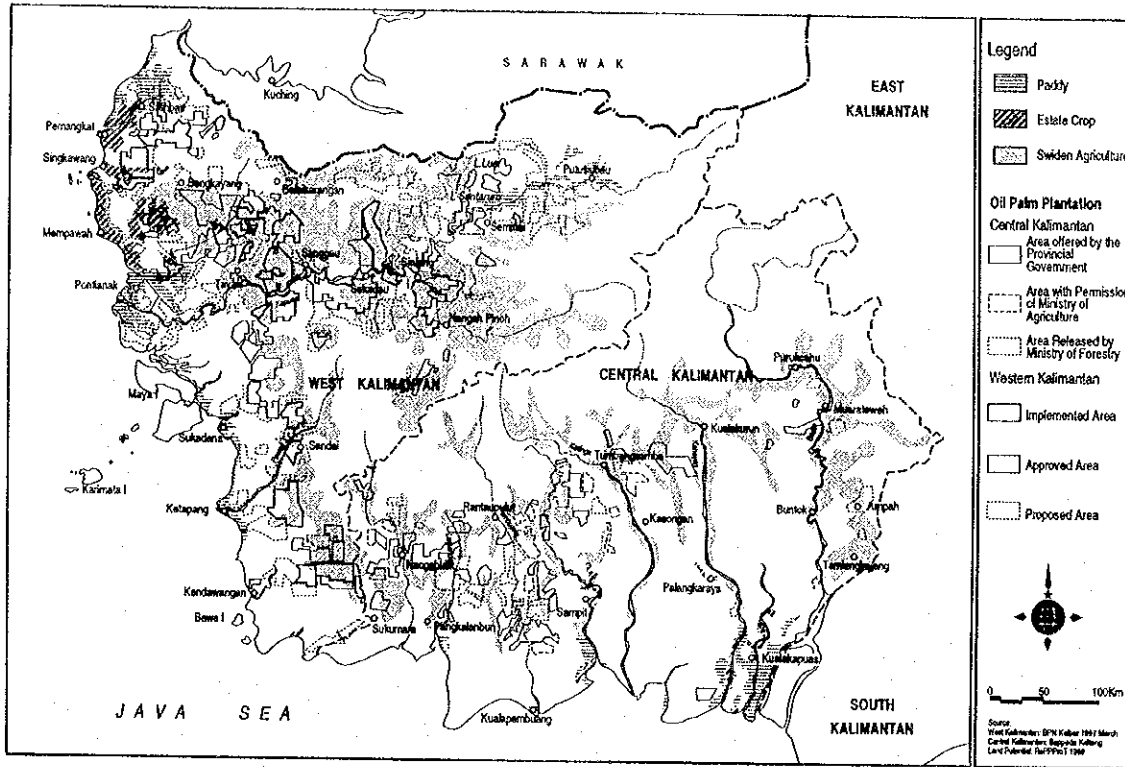
Before the present economic crisis, it was considered that the existing development permits for oil palm plantations of the two provinces and the world prospects for palm oil suggest that the expansion of area under oil palm will be further accelerated in the next 5-10 years.

Based on the data on land development concessions for oil palm plantations, a likely increase of oil palm plantation and CPO production is estimated as shown in Table 3.2. Based on this estimate, the value added by oil palm plantation and CPO production is also estimated as shown in Table 3.3.

The estimated share of value added by oil palm plantation and CPO production is only 8% and 10% of the future GRDP in West and Central Kalimantan respectively. These percentages are much smaller than those of the forestry and wood processing industries at present. This is partly because the prospective development of supporting subsectors, such as the trading and transport of fertilizers and pesticides and the transport of CPO, are not yet counted by the shares. However, more importantly, this estimate strongly implies that it is necessary to take

advantage of the region’s prospective CPO production capacity for developing downstream industries in order to create higher value added within the region, since a huge area of precious land resources is to be allocated for oil palm plantations.

Figure 3.1 Contested Land Resources between Oil Palm Plantation and Swidden Agriculture



If oil-palm-related downstream industries (cooking oil, soap and oleochemical) are successfully promoted, all the oil-palm related subsectors, including palm oil plantation, CPO production, the downstream industries, and trading and transport, might be able to produce as much as 30% of GRDP of the region.

Table 3.2 Estimated Increase of Oil Palm Plantation and CPO Production

| | 1996 | | 2018 | |
|--------------------|----------------------------|-------------------------------|----------------------------|-------------------------------|
| | Area Planted (1,000 ha) | CPO Production (1,000 ton) | Area Planted (1,000 ha) | CPO Production (1,000 ton) |
| West Kalimantan | 211 | 205 | 872 | 2,669 |
| Central Kalimantan | 30 | 12 | 675 | 2,965 |

Source: The estimate in 2018: JICA-SCRDP Kaltengbar

Table 3.3 Estimated Amount of Value Added generated by both Oil Palm Plantation and CPO Production

| | 1996 | | 2018 | |
|--------------------|----------------------------|---|----------------------------|---|
| | Value Added (Million US\$) | Share of Contribution to Total GRDP (%) | Value Added (Million US\$) | Share of Contribution to Total GRDP (%) |
| West Kalimantan | 42 | 1.4% | 556 | 8% |
| Central Kalimantan | 2.5 | 0.1% | 434 | 10% |

Source: The estimate in 2018: JICA-SCRDP Kaltengbar

3.3 POSSIBLE IMPACTS OF HIGH CONCENTRATIONS OF OIL PALM PLANTATIONS

Although the establishment of the plantation industry can have positive impacts on the economic development of the study area, such as increases in regional income and employment, specialization in palm oil production and the concentration of large oil palm estates in the area are likely to have some undesirable impacts, not only on the economy but also on the society and the environment. Such impacts include:

1) While the oil palm plantation industry has begun to become the prime mover of economic growth in the two provinces and to help to improve the welfare of local people, the expansion has also brought about various kinds of problems, particularly those related to the extensive land development. The results of the social survey and interviews conducted by the JICA study team exhibit such cases as: 1) A land is offered by the provincial government without consultation with local communities; 2) Local participants in a PIR project are compelled to give up their productive farms and groves because of the obscure procedure for land acquisition; 3) Those whose lands have been expropriated for a plantation are paid little compensation for the loss even where customary rights have been established; and 4) Land disputes between the plantation companies and local communities continue.

2) The economy will become highly dependent on the production of a single primary product, palm oil, whose price fluctuates according to the situation of international markets. As demonstrated by most of the countries specializing in one or a few primary commodities (e.g., bananas, coffee, copper, etc.), the area's economic growth will be instantaneously, and constantly, influenced by changes in the international prices of oil palm. The World Bank long-

term projections indicate a decline in palm oil prices in real terms after 2000 despite the general prospect of a growing world demand for the oil.¹

3) A large part of the profit generated in the plantation industry will be “repatriated” to Jakarta because it is a capital intensive industry and because of the availability of loans from local banks is limited. It is therefore highly likely that the plantation development will have only a limited impact on the regional economy.

4) The regional society may be adversely affected by the changes in landuse and farming and settlement patterns. Some indigenous people are forced to alter their ways of farming and living due to the increased competition for land resources brought about by the development of an oil palm plantation. In the worst cases, they have to give up their houses and farms and/or groves which are still productive and can generate income.

5) Although the impacts of oil palm plantation development are difficult to assess and predict, the expansion of areas planted with oil palms at an unprecedented speed is expected to cause severe environmental degradation. Soil erosion due to land clearing and pollution due to the extensive use of agricultural chemicals, such as fertilizers, herbicides, and pesticides, will possibly damage the ecosystem of the study area. For fertilizers alone, for example, as much as one ton is applied to one hectare of land annually. If development is continued at the present rate and planned scale, many species, including those of a great economic value, will likely disappear from the area in not so distant future. Their impacts on the health of farmers, workers and residents in and around plantations should also not be overlooked.

6) Food production may decrease without proper landuse planning since a large part of the lands on which oil palm plantations are being or planned to be established are currently used for food crop cultivation.² Therefore it is important to formulate a landuse plan to secure areas suitable for food crop production.

7) Most oil palm plantation projects are located in areas where other alternative economic activities are not available to smallholders once the lands endowed with resources are cleared for large-scale plantations. Therefore, there would be more chances both for transmigrants and for local participants to be better-off if they could preserve and utilize economic resources, such as swidden farms, villages and local knowledge in and around project areas.

¹ World Bank, *Commodity Markets and The Developing Countries*, Vol. 4, No. 2, February 1997.

² The situation is described in Appendix to Chapter 3

3.4 IMPACT OF THE PRESENT ECONOMIC CRISIS ON THE OIL PALM SUBSECTOR

The bright prospects of the oil palm subsector have diapered since the beginning of the economic crisis. The oil palm subsector has been facing an emerging unfavorable business environment, such as the increase of export taxes on CPO, unsmooth flow of credit money for smallholder development, complicated and time consuming permission procedures, and unsupportive road development policies.

Implementing the policies for providing a good business environment for the oil palm subsector is very important for West and Central Kalimantan, compared to the case of Sumatra, another major oil palm production region. West and Central Kalimantan still have many oil palm plantations to be developed. If the government continues unfavorable policies against the oil palm subsector, it would largely delay the realization of the development potential of oil palm plantations and of oleochemical industries.

3.5 JICA-SCRDP-KALTENGBAR'S RECOMMENDATIONS TO POLICIES ON THE OIL PALM INDUSTRY

JICA SCRDP-Kaltengbar has identified three areas for recommendation on the policies concerning the oil palm industry, namely 1) business environment, 2) oil palm plantation development and 3) assistance for the development of smallholder plantations. The following are the recommendations from the regional development planning study for the western part of Kalimantan.

3.5.1 Business Environment

1) For the government to establish stable policies to ensure an appropriate business environment for the oil palm industry including oil palm plantation development, downstream industrial development, export of CPO, and export of downstream industrial products.

2) For the government to carefully design a cooperative-based scheme for oil palm plantation development which could attain an appropriate business environment for oil palm plantation development. However, it is risky to replace all the existing oil palm plantation development schemes with the new cooperative-base scheme because such drastic changes in oil palm related policies might suddenly deteriorate the investment environment of the oil palm industry in Indonesia.

3) For the government to show its intention to support oil palm plantation development by establishing infrastructure development plans, especially the plans for road development in prospective oil plantation development areas.

3.5.2 Oil Palm Plantation Development

1) For the government to guide oil palm plantation development on suitable land, especially at the preliminary stages of offering lands and issuing permits for oil palm plantation development.

2) In the areas of relatively high population density (such as the Kapuas river basin of West Kalimantan), for the government to regulate private companies' oil palm plantation development in order to maintain the existing livelihood means of the local people so that local people's local rubber groves, dryland paddy fields and rattan gardens are not sacrificed for the sake of oil palm plantation development.

3) In the areas of relatively low population density (such as in Central Kalimantan and the Ketapang District of West Kalimantan) for the government to encourage or guide oil palm plantation development by private companies to involve as many local people as possible as smallholders, by allocating smallholder plantations within a commutable distance of existing settlements.

4) To pursue both the purposes mentioned above, for the government to encourage private plantation companies to adopt a community-based participatory method for landuse planning for oil palm plantation development, by giving incentives to private plantation companies.

5) To pursue the smooth development of oil palm plantations and to pursue sustainable operation of oil palm plantations, for private companies to adopt a community-based participatory method for landuse planning for oil palm plantation development, rather than the top-down approaches which are utilized presently.

3.5.3 Assistance for the Development of Smallholder Plantations

1) For the government to establish credit schemes for assisting smallholder plantation development. The smallholder credit schemes should be directly applied to cooperatives (KUD) and other types of farmers' groups, instead of the existing schemes like the PIR-KKPA scheme, in which the credits assisting smallholders are channeled through plantation companies.

2) For the government to start an assistance scheme (both financial and technical assistance) for promoting the development of smallholder oil palm plantations in areas surrounding existing

CPO factories This type of smallholder plantation does not have nucleus estates run by plantation companies, but they depend on existing nucleus estates and CPO factories.

3.6 IMPLEMENTATION AGENCIES

The implementing agency of this study project should be one of the planning divisions, who take care of planning in Direktorat General of Plantation, the Ministry of Forestry.

3.7 OBJECTIVES OF THE STUDY PROJECT

- To review the recent development of the oil palm industry
- To review the recommendations on the oil palm industry
- To study measures for improving the business environment
- To study models of cooperative-based oil palm plantation development
- To study community based participatory landuse planning schemes
- To study assistance systems for smallholder plantations in new development
- To study assistance systems for smallholder plantation development in established oil palm areas
- To make an implementation program for improving the business environment for the palm oil industry

3.8 STUDY AREA

The study area is the provinces of West Kalimantan, Central and East Kalimantan.

3.9 SCOPE OF WORK

(1) Inception Report Preparation

[Task 1] To review the recent developments of the oil palm industry

[Task 2] To review the recommendations on the oil palm industry made by JICA-SCRDP-Kaltengbar

[Task 3] To produce the draft Inception Report which specifies the revised scope of work for the following phases, based on the analyses of the results of [Task 1] and [Task 2]

[Task 4] Discussion and agreement of the draft Inception Report with the Indonesian government side

(2) Component A: Policy Study on Improving the Business Environment Of The Oil Palm Industry

[Task 5] Review and Analysis of the Existing Policies on the Oil Palm Industry

The policy review covers the following:

- Oil palm plantation development
- CPO factory operation and export of CPO
- Downstream industries, such as cooking oil
- Oleochemical industry

[Task 6] Preparation of Recommendations on the Policies concerning the Oil Palm Industry

This task will be able to be completed by incorporating the other study components.

(3) Component B: Study And Design Of Models Of Cooperative-Based Oil Palm Plantation Development

[Task 7] Review of the On-going Discussions on the Cooperative-Based Model of Oil Palm Plantation Development

[Task 8] Economic Feasibility Study of the Cooperative-Based Model of Oil Palm Plantation Development

[Task 9] Financial Feasibility Studies of Smallholder Households Participating in the Oil Palm Plantation Development

[Task 10] Preparation of Recommendations on the Cooperative-Based Oil Palm Plantation Development

[Task 11] Study of Alternative Models for Smallholder Oil Palm Plantation Development

(4) Component C: Study of Community-Based Participatory Landuse Planning Schemes

[Task 12] Review of the existing problems concerning smallholder plantation development

[Task 13] Four Case Studies of the Existing Smallholder Plantation Development Sites

These case studies are to cover both the plantation company's side and the smallholders' side. There are two types of geographical situations to be covered by the case studies. One is the area of relatively high population density, in which no transmigrants are involved. The other is the area of relatively low population density, in which transmigrants are mobilized. Two sites of each type are to be studied.

[Task 14] Preparation of Alternative Models for Community-Based Participatory Landuse Planning

[Task 15] Study on Institutional Arrangements for Adopting the Community-Based Participatory Landuse Planning Models

[Task 16] Preparation of Recommendations on Landuse Planning for Oil Palm Plantation Development

(5) Component D: Study On Assistance Systems To Smallholder Plantations

There are two cases of assistance to smallholder plantation development

One is the case of new development of oil palm plantations of both nucleus and smallholders. The other is the case of development of smallholder plantations in the established oil palm plantation areas.

[Task 17] Review of the Existing Smallholder Credit Schemes

[Task 18] Review of the Thailand and Malaysian Credit Schemes for Assisting Smallholder Oil Palm Plantation Development

[Task 19] Preparation of Alternative Smallholder Credit Schemes

[Task 20] Study on Other Assistance Schemes, such as Technical Extension Services

[Task 21] Preparation of Recommendation on the Smallholder Credit Schemes

(6) Formulation of Implementing Programs

[Task 22] Analysis of Potential and Constraints of the Recommended Policy Changes and Programs

[Task 23] Preparation of Alternative Implementing Programs

[Task 24] Preparation of Alternative Institutional Arrangements for Implementing Programs

[Task 25] Preparation of Recommended Implementing Programs

3.10 NECESSARY INPUT

Expatriate Consultants

| | |
|--|-------------------------|
| - Team Leader/ Oil Palm Specialist | 12 person-months |
| - Regional Planner | 10 person-months |
| - Investment Promotion Specialist | 7 person-months |
| - Participatory Planning Specialist | 7 person-months |
| - Oil Palm Plantation Development Specialist | 7 person-months |
| - Oil Palm Plantation Operation Specialist | 7 person-months |
| - Oil Palm Processing Industry Specialist | 7 person-months |
| - Credit Scheme Specialist | 7 person-months |
| - Evaluation Economist | 4 person-months |
| <u>Sub-Total of Expatriate Consultants</u> | <u>68 person-months</u> |

Local Consultants

| | |
|--|-------------------------|
| - Sub-Team Leader/ Oil Palm Specialist | 12 person-months |
| - Regional Planner | 10 person-months |
| - Oil Palm Plantation Development Specialist | 10 person-months |
| - Investment Promotion Specialist | 10 person-months |
| - Participatory Planning for Rural Development | 10 person-months |
| - Sociologist | 8 person-months |
| - Institutional Specialist | 8 person-months |
| - Cost Estimate Specialist | 8 person-months |
| - Social Survey Specialist | 8 person-months |
| - Credit Scheme Specialist | 8 person-months |
| - Evaluation Economist | 6 person-months |
| <u>Sub-Total of Local Consultants</u> | <u>98 person-months</u> |

3.11 SCHEDULE

Since problems with oil palm plantation development are quite serious in Kalimantan, it is recommended to start this study project as soon as possible in the midst of the present economic recession, so that it is possible to encourage private companies to re-start their investment in oil palm plantation development and downstream industries in a better business environment just after the recovery of the economic recession.

The study project takes at least one year but it should not take more than 1.5 years because of the necessity of well-thought of but quick actions.

APPENDIX TO CHAPTER 3

Discussion Paper No.3

Proposal of

A New Community-Based Oil Palm Plantation Development Scheme

The JICA Study SCRDP-Kaltengbar

February 8, 1998

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1. BACKGROUND

In the last decade, West Kalimantan has experienced the rapid expansion of large-scale oil palm plantations. In the near future, Central Kalimantan will also go through similar experiences. Under this condition, there have been an increasing number of incidents of land disputes and social conflicts between indigenous communities and plantation companies.

Such land disputes and social problems derive from the companies' careless approach to plantation development, as well as misunderstanding of the social settings of plantation development. In West Kalimantan, the population density of the target areas of plantation development is relatively low (15-20 persons per km²) compared to that of Java and Bali. However, it is not vacant land or vacant forest. It is the place where indigenous people make a living utilizing land and forest resources, although their utilization is of low density. If plantation companies fail to pay attention to such social situations, the companies' activities will easily cause land disputes and social conflicts with the local people.

Many such cases result not only in delay of crop production, but also in poor performance of the plantation business. Now, most plantation companies are struggling with how to deal with local communities for the smooth development and operation of oil palm plantations. So far, however, no systematic means to solve such problems are available to plantation companies.

In this discussion paper, first, we will examine social situations and issues around plantation development. Second, a new oil palm plantation development scheme will be proposed. Third, we will explain the rationale of the new scheme by relating to the social situations and by comparing the new scheme to the existing schemes. Finally, we will turn to further studies needed for refining this scheme.

2. ISSUES AND OBJECTIVES OF OIL PALM PLANTATION DEVELOPMENT

2.1 Socio-Economic Settings

Indigenous swidden farmers' communities are distributed over forest areas. Those village settlements are located along rivers and streams. The area used to be very remote, only connected to a nearby town by river transport. However, the recent development of roads opened up opportunities for new landuse development, especially oil palm plantation development.

The population density of the areas for prospective plantation development ranges from 15 to 20 persons per km². In the villages of this level of population density, the following phenomena are found:

- Expansion of alang-alang grass lands in village territories, resulting in the reduction of forest lands for swidden agriculture
- Expansion of rubber groves over village territories
- Increasing differentiation of holding sizes of rubber groves and swidden lands
- Decreasing rice yields from ladang due to repeated use of forest lands

2.2 Issues and Objectives

The issues here are how to satisfy the following objectives:

- To improve business feasibility of oil palm plantation business (How to conduct smooth planning and implementation should be considered),
- To enhance social feasibility of oil palm plantation development in areas of relatively high population density (How to reduce land disputes, labor disputes and other social problems should be sought), and
- To secure a sustainable livelihood for plasma farmers and their future generations (How to avoid risks derived from heavy dependence on oil palm plantation should be sought).

3. SCOPE OF A NEW OIL PALM PLANTATION DEVELOPMENT SCHEME

3.1 Basic Features of the Proposed Scheme

In order to deal with the issues and objectives identified in the previous section, we will propose a new oil palm plantation development scheme with the following features:

- (1) The PIR type (the type integrating nucleus plantations and smallholder plantation) is used in the proposed scheme. The plantation company initiates the plantation business, while the local people join the plantation business as smallholders/ plasma farmers.
- (2) The proposed scheme is based on KKPA (primary cooperative credit for members) or other credit programs for obtaining subsidized credits from the government.
- (3) The proposed scheme accommodates no transmigration settlements or only small-scale transmigration settlements,¹ depending on land availability. As a result, the following points (4) and (5) become possible.
- (4) Plasma farmers are allowed to keep existing livelihood options (such as rubber groves, land for growing rice and extraction of non-timber forest products) in order to avoid risks derived from the unfamiliar work of running an oil palm plantation and for the purpose of securing livelihood sustainability. To satisfy these conditions, it is necessary to set aside the existing rubber groves, swidden lands and forests for extracting non-timber forest products to a certain extent.
- (5) Plasma farmers do not have to resettle from their present residence (kampung) so that they can secure a variety of resources including a kampung social organization and forest environments.
- (6) The proposed scheme is based on the cooperation of communities and a plantation company in landuse planning and project implementaion. The community here is 'dusun' in the West Kalimantan's setting and 'desa' in the Central Kalimantan's setting.

¹ This small-scale transmigration settlement is like Transabangdep Scheme, which is a small-scale settlement integrated into an existing village.

3.2 The Necessity of Participatory Landuse Planning

For realizing the oil palm plantation development of the above features, landuse planning based on community's participation is inevitable. It is necessary to allow the local people to participate in the planning procedure to decide the location of nucleus estates and smallholder estates. Despite sharing a core purpose of plantation development, the communities and the company have different interests. For the company, it is important to secure a certain amount of good land for plantation development. On the other hand, it is important for the communities or the local people to secure sustainable livelihoods by combining the new plantations and with present livelihood means. Without close negotiation and compromising between the two parties, it will easily result in unsolvable social problems.

As examined in the case study later, the role of communities (dusun in West Kalimantan and desa in Central Kalimantan) is important because the conventional land exchange (land adjustment) of local people who participate in plantation development is very complex and unrealistic. By giving major roles of landuse planning to the community, it is possible to arrange land adjustment at the inter-community level. Within the community, the community members can negotiate with each other for land exchange.

The landuse planning could be effective on the basis of local people's knowledge on local conditions, such as soils and forests.

As seen in the above, the proposed oil palm plantation development scheme is based on the existing ones in terms of company- smallholders combination and credits but our proposal is new in the emphasis of landuse planning. We regard the landuse planning as the key solving the problems concerning both, the company and smallholders. The practice of landuse planning includes land allocation for nucleus plantations and plasma plantations over village territories.

3.3 Procedure of Participatory Landuse Planning for the Community-Based Oil Palm Plantation Development Scheme

Conventional Procedure of Plantation Development Planning

- (1) The company collects signed agreements of surrendering a certain amount of land to plantation development from villagers. Each agreement paper has information on which land plots are to be surrendered and where the land plots are.
- (2) The company conducts land measurement of lands to be surrendered.
- (3) The total amount of land plots to be surrendered is calculated.
- (4) Based on the total amount of land plots, the company will make a block plan of plantations.
- (5) The company will ask the village to arrange land exchange among villagers.

Proposed Procedure of Plantation Development Planning

- (1) The company and communities collect geographic information including community boundaries, rivers and foot paths, lands desirable for plantations and lands which villagers want to keep for themselves.
- (2) Based on the geographical information, the company and the communities make alternative landuse plans / block plans, with some assistance of an expert team.
- (3) In the course of the above landuse planning, some negotiations for land acquisition are going on, between the company and communities, and between different communities.
- (4) Between different communities (dusun or kampung), some exchanges of lands are arranged.
- (5) Among the community members (members of dusun or kampung), some exchange of lands are arranged.
- (6) The landuse plan is finalized between the company and the communities.

4. CASE STUDY ON A NEW OIL PALM PLANTATION DEVELOPMENT SCHEME AT DESA SEBABAS, KECAMATAN NANGA MAHAP

In order to examine the characteristics of the proposed scheme, we conducted a case study of landuse planning in Desa Sebabas, Kecamatan Nanga Mahap, based on the available information (See Figure 1).

4.1 The Proposed Scheme

Please see Figure 2.

Merits

- The local people can keep existing livelihood means by securing existing rubber groves and swidden lands (including lands under swidden fallow).
- The local people do not have to resettle to newly prepared settlements.
- The territories of communities (dusun or kampung) are not changed very much.

Demerits

- Longer roads are needed to be constructed to connect nucleus estates and smallholder plantations.
- It takes time to reach the final plan.

4.2 Conventional Scheme

Please see Figure 3.

Merits

- Roads are shorter than the proposed scheme.
- The estates are concentrated in one place. As a result, its construction is easier than the proposed scheme.

Demerits

- The existing rubber groves and swidden lands (including lands under swidden fallow) are lost.
- Since a village is a unit of negotiation, village members need to exchange land plots with each other. However, it is too complex to reach a consensus landuse plan based on the exchange of individual holdings.
- Resettlement of the local people is needed.
- The territory of each community will be lost.

5. NECESSITY OF GOVERNMENT'S ASSISTANCE

5.1 Technical Assistance for Participatory Landuse Planning

The proposed participatory landuse planning needs a certain amount of professional expertise. An expert team is required for such landuse planning, consisting of the following members:

- One Landuse planner
- One Facilitator for the local people's participation
- Two Mapping Specialists using the Global Positioning System

In order to encourage both plantation companies and local communities to apply the planning method, some government assistance would be needed.

5.2 Assistance for Rural Road Development

As seen in the above case study, longer roads are needed to implement the proposed scheme compared with the conventional scheme. In order to give incentives to encourage plantation companies to pay more attention to the livelihood of the local population, it is necessary for the government to assist the plantation companies in the construction of rural roads which would become necessary for connecting smallholder plantations with plantation service roads.

6. FURTHER STUDIES NEEDED

In order to implement participatory landuse planning more effectively, more case studies should be conducted in the following areas:

Areas of low population density

In the case of Central Kalimantan, transmigration would be needed. The involvement of transmigration would increase the complexity in landuse planning in the areas of social stability and land allocation for the transmigrants' livelihoods.

Areas of medium population density

Unlike the case study of the Nanga Mahap area, there are places which have less along-along areas like those in the interior of the Ketapang district, West Kalimantan. The local people's desire for land allocation would be different.

Approach methods of plantation companies to local communities

Different plantation companies exercise a variety methods of approaching local communities and implementing plantation development. It is necessary to conduct studies on the factors concerning plantation companies are needed.

BOX:

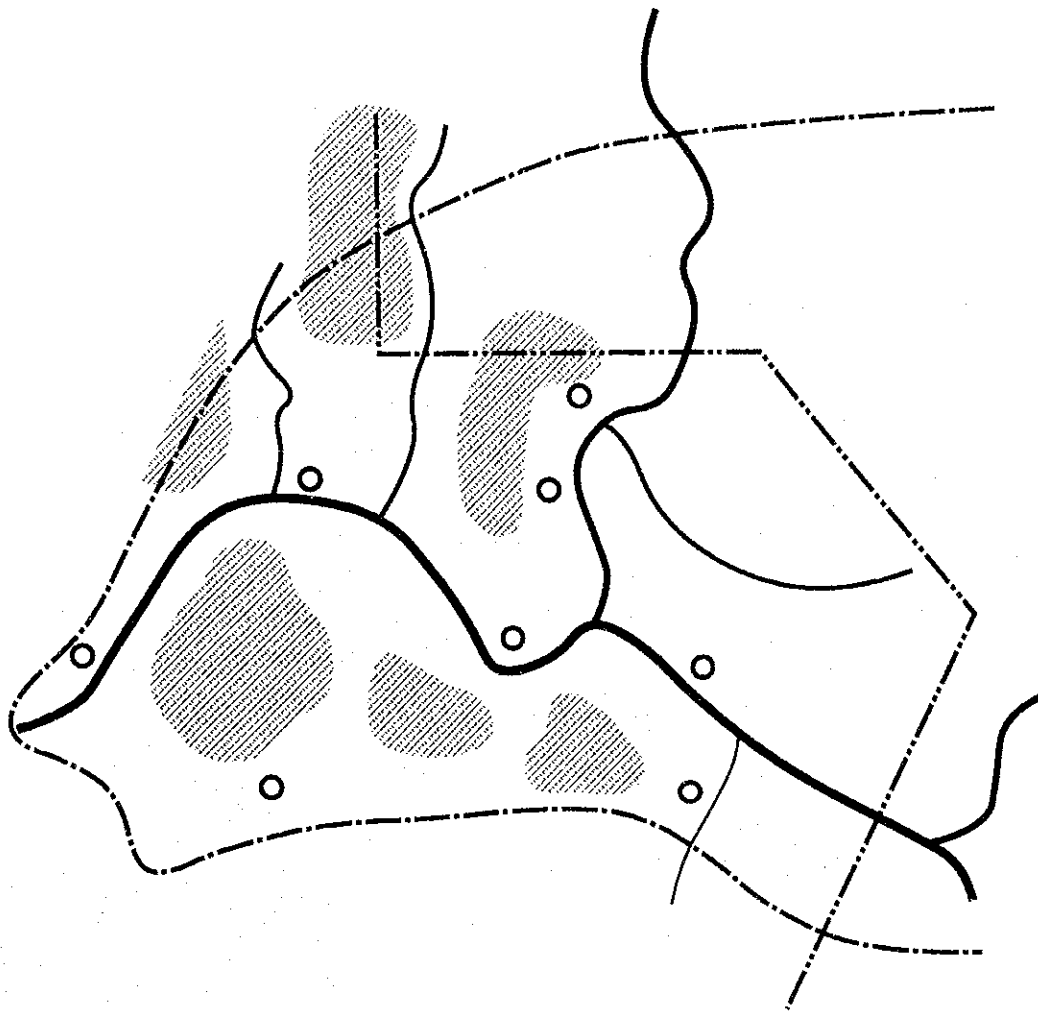
**THE CASE OF OIL PALM PLANTATION DEVELOPMENT IN
KECAMATAN NANGA MAHAP BY P.T. KALIMANTAN OILO
INDUSTRI (PT KOI)**

PT KOI's general manager in Pontianak, Mr. Fresh Lande, is a man of innovative ideas for oil palm plantation development. He is trying to learn from the past experiences of other plantation companies and to improve his development scheme. The challenges he faces would result in the following innovations:

- (1) PT KOI adopts a PIR-Kemitraan, which is a PIR-scheme, a joint-operation scheme with local people but not integrated with transmigration.
- (2) Not only the existing local households but also young adults who are going to form households in the near future could participate in the plantation development.
- (3) Besides oil palm, other tree crops, such as coffee and cacao, fruit trees, Tengawang, and grasses for raising cattle are also considered for plantation operation.
- (4) PT KOI's scheme is not based on credits from the government through KKPA (primary cooperative credit for members) but based on a project management unit managed by KUD. Plasma farmers can get credit from Bank Rakyat Indonesia because they get land certificates for prospective plasma plantation plots.
- (5) PT KOI considers giving assistance to the children of plasma farmers for continuing secondary school education because PT KOI considers that future plasma farmers need higher education standards.
- (6) PT KOI has considered allocating certain amounts of plasma plantations to school teachers and army officials during their terms of office (like Tanah Bengko in Java).
- (7) To encourage the local people's participation, PT KOI established two local institutions. One is the task force for the arrangement at the subdistrict Level (Satuan Tugas or Satgas) and the other is the unit for implementation at village level (Satuan Pelaksana or Satlak), both of which include local government officials, members of village governments and ordinary villagers. Satgas has 55 members, while Satlak has 161.

Source: The JICA study team's interview with Mr. Fresh Lande on December 22, 1998, and Professor Dr. A.B. Tangdililing, MA and Ir. Augustine Lumangkun, Msc (1998) The Social Interaction between the Society in Kecamatan Nanga Mahap and PT. Kalimantan Oleo Industry, Pontianak, A brief study commissioned by the JICA Study SCRDP-Kaltengbar.

Figure 1 The Present Landuse Information



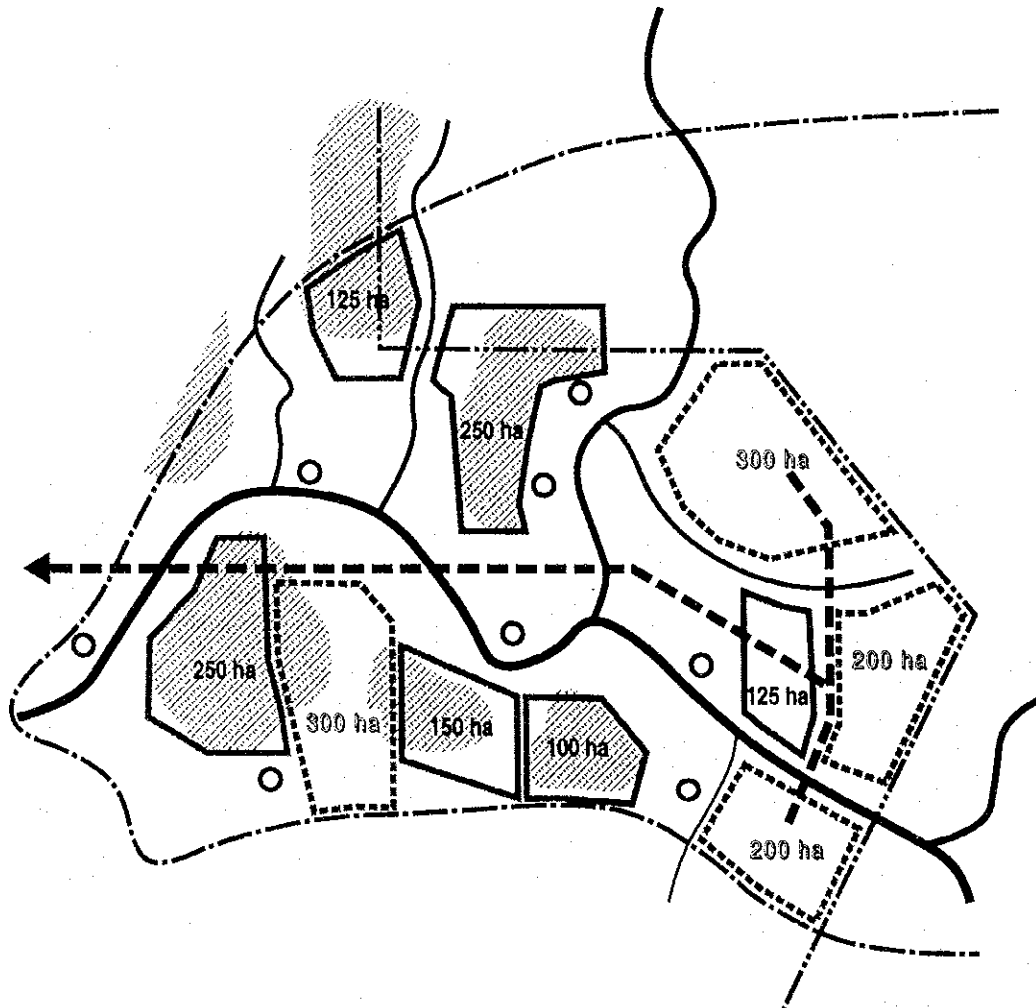
LEGEND :

- Desa Boundaries
- Scheme Boundaries
- ~~~~~ River
- ////// Alang-alang Area
- Dusun's Settlement

| | | |
|--|-------|----|
| Total area for the scheme in desa | 4,000 | ha |
| Number of dusun | 8 | |
| Population in the scheme | 2,200 | |
| Number of households (ave. 5.5 / h) | 400 | |
| Required area for plantation development | | |
| <u>Actual planting area</u> | | |
| for nucleus estate | 700 | ha |
| for smallholders | 800 | ha |
| Total actual planting area | 1,500 | ha |
| <u>Area to be provided</u> | | |
| for nucleus estate | 1000 | ha |
| for smallholders | 1000 | ha |
| Total estate area | 2,000 | ha |

Source: JICA-SCRDP Kaltengbar

Figure 2 Landuse Plan of Nucleus and Smallholder Plantation for the Proposed Scheme (An Example)



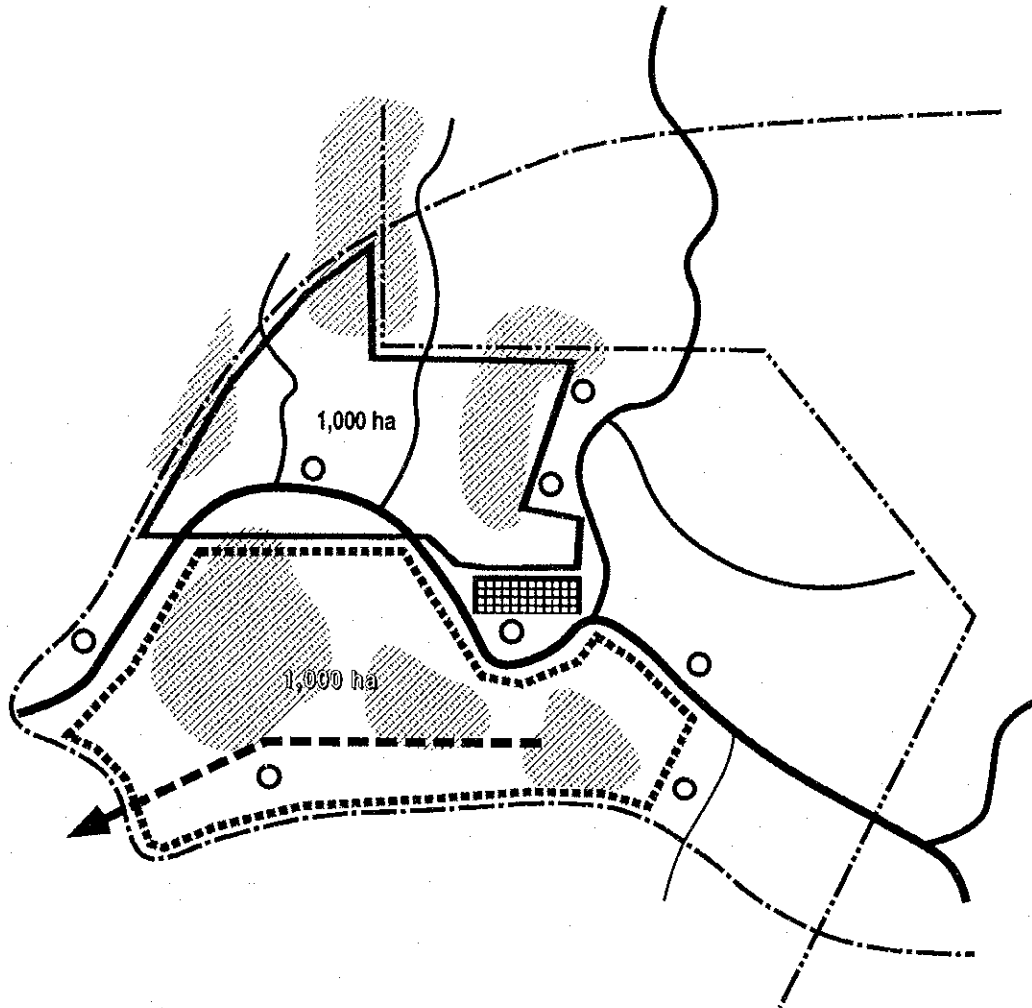
LEGEND :

- Desa Boundaries
- Scheme Boundaries
- ~~~~~ River
- Plantation Road
- ////// Alang-alang Area
- Nucleus plantation Area
- Smallholders plantation Area
- Dusun's Settlement

| | |
|---|----------|
| Total area for the scheme in desa | 4,000 ha |
| Number of dusun | 8 |
| Population in the scheme | 2,200 |
| Number of households (ave. 5.5 / h) | 400 |
| Required area for plantation development | |
| <u>Actual planting area</u> | |
| for nucleus estate | 700 ha |
| for smallholders | 800 ha |
| Total actual planting area | 1,500 ha |
| <u>Area to be provided</u> | |
| for nucleus estate | 1000 ha |
| for smallholders | 1000 ha |
| Total estate area | 2,000 ha |

Source: JICA-SCRDP Kaltengbar

Figure 3 Landuse Plan of Nucleus and Smallholder Plantation for the Conventional Scheme (An Example)



LEGEND :

- Desa Boundaries
- - - - - Scheme Boundaries
- ~~~~~ River
- ==== Plantation Road
- //// Alang-alang Area
- Nucleus plantation Area
- Smallholders plantation Area
- Dusun's Settlement
- #### Resettlement Site

| | | |
|--|-------|----|
| Total area for the scheme in desa | 4,000 | ha |
| Number of dusun | 8 | |
| Population in the scheme | 2,200 | |
| Number of households (ave. 5.5 / h) | 400 | |
| Required area for plantation development | | |
| <u>Actual planting area</u> | | |
| for nucleus estate | 700 | ha |
| for smallholders | 800 | ha |
| Total actual planting area | 1,500 | ha |
| <u>Area to be provided</u> | | |
| for nucleus estate | 1000 | ha |
| for smallholders | 1000 | ha |
| Total estate area | 2,000 | ha |

Source: JICA-SCRDP Kaltengbar