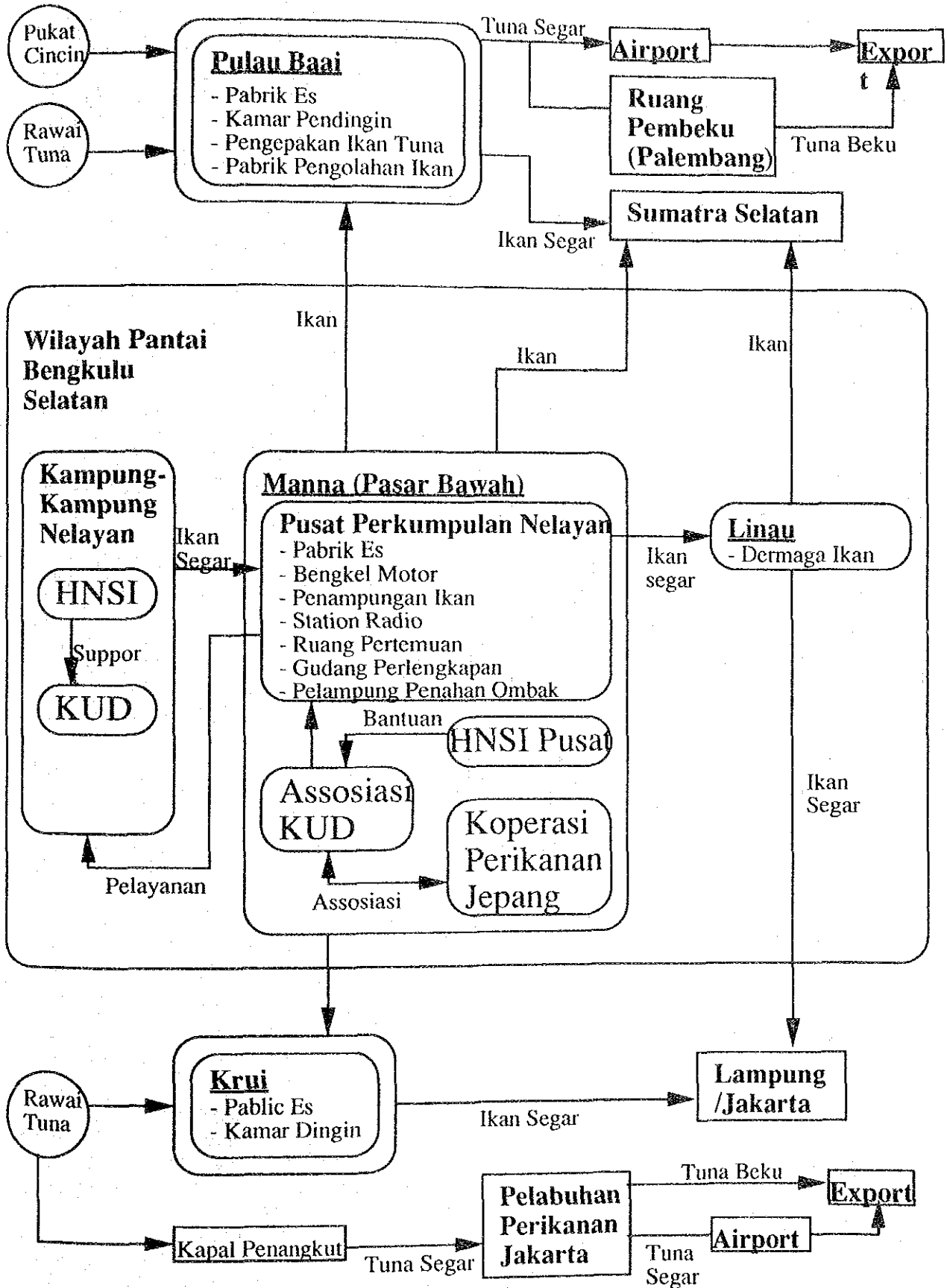


Figure A2.5.1 Diagram Jalur Sistim Antara Desa Nelayan dan Usaha Perikanan



2.2 COASTAL FISHERIES MANAGEMENT PROJECT

2.2.1 Objectives of the Project and Its Role in the Regional Development

Fisheries are one of the important economic sectors in Kab. Tanjung Jabung, as a source of foreign exchange earning. Major fisheries export commodities include frozen shrimp, salted/dried jellyfish, and shellfish meat, exported to Singapore and Malaysia. In 1991, the region exported about 949 tons (about 2,180 tons on raw material weight). In addition, it is noted that about 8,000 tons of shrimp and fish are sent to other provinces, mostly to Tanjung Balai Kalimun (Riau Islands) for indirect export (about 50%) and Palembang as raw materials for cold storage (about 30%). Only 20% of fishery products are directly exported from this area.

Due to the excessive fishing activities with operation of numerous number of traditional fishing gears including tidal traps (togok, gombang, etc.) and mini-trawls (lampara dasar and dogol) in the near shore, recent catch of shrimp/fish has been stagnating and average size of shrimp/fish has become smaller.

This project is aimed to mitigate these excessive fishing activities in near shore, which may lead to resources depression, and to control coastal fisheries activities through adoption of appropriate integrated resources management plan. Finally, it is expected to upgrade small-scale fishermen and promote the export of fishery products with creation of new fishing grounds for high-valued demersal fish and conversion into brackishwater shrimp aquaculture (tambak).

2.2.2 Location

The Project areas will include the entire coastal water and land of Kab. Tanjung Jabung, Jambi Province. Total coastal water has 9,250 sq.km. The area forms a shallow shelf of 0 - 20 m in depth having a wide inter-tidal zones. The coastal area is covered by mangrove forest of about 500 m wide from the shore-line. With the effects of rich-nutrient freshwater brought from rivers, the coastal waters have been provided with rich shrimp resources. Due to the excessive fishing efforts and the heavy sedimentation caused by deforestation in the upper-stream of Batang Hari River Basin, however, the recent shrimp/fish stock seems to be damaged.

2.2.3 Executing Agency

The executing agencies will be the Directorate General of Fisheries, Ministry of Agriculture, in collaboration with other relevant departments/agencies, namely, Ministry of Forestry, National Board of Agraria, Ministry of Internal Affairs, and so on.

The positive participation of local fishery-related people including local governments, private fishing companies and small-scale fishermen will be indispensable in order to let them understand the importance of resources management, to get their cooperation for implementing the project, and to take actions necessary for ensuring sound fisheries management.

2.2.4 Expected Benefits

In the course of the project implementation, the most important matter is that local people would have strong intention to conserve and manage their fishery resources by themselves as the region's precious property. Any regulation or law from the government seems to be difficult to make the relevant people fully observe without their understanding and willing cooperation.

Once local people are standby to accept the resource management plan, the project objectives will be fulfilled in accordance with physical progress. The new fishing grounds will

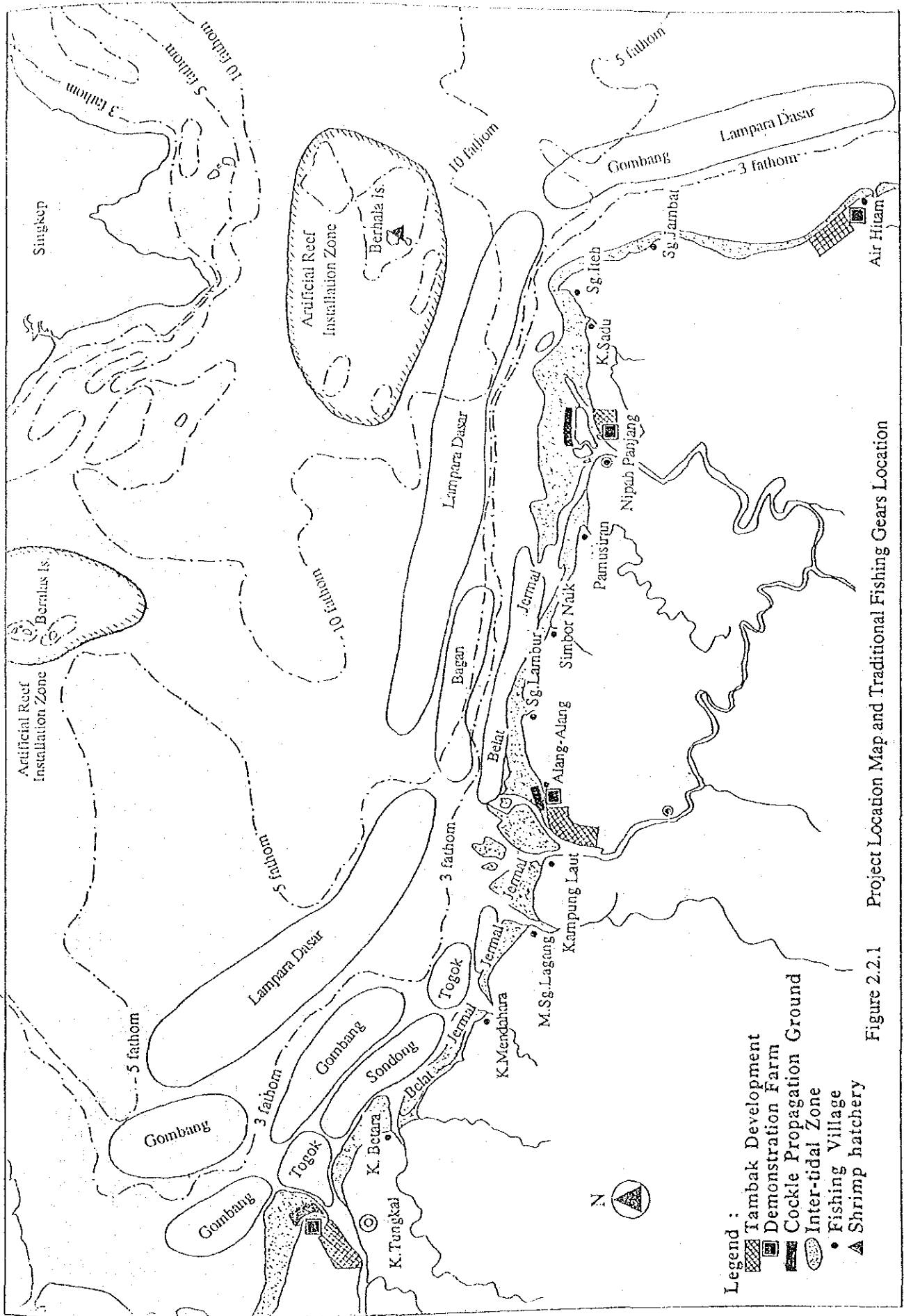








Figure 2.2.1 Project Location Map and Traditional Fishing Gears Location

- Legend :
-  Tambak Development
 -  Demonstration Farm
 -  Cockle Propagation Ground
 -  Inter-tidal Zone
 -  Fishing Village
 -  Shrimp hatchery

provide fishermen with the better catch efficiency of high-valued fishes (grouper, snapper, etc.), while the promotion of tambak will generate alternative source of shrimp supply for exporters.

2.2.5 Outline of the Project

(1) Background

Fish production in Kab. Tanjung Jabung was 18,367 tons consisting of 17,606 tons from marine fishery and 761 tons from inland fishery and aquaculture in 1991. Due to the limited of land transportation in the swamp zone, the population in this kabupaten has been concentrated in coastal area. Thus, marine fishery occupies over 95% of its production volume. There are about 2,290 fishing households with 2,369 fishing boats. Out of that, about 93% are inboard engine type boats, by which much higher fishing efforts have been made to fishing activities, comparing with the west coast of Sumatra.

Table 2.2.1 : Current Status of Marine Fishery in Kab. Tanjung Jabung

Item	Kecamatan			Total
	Muara Sabak	Nipah Panjang	Tungkal Ilir	
1) No. of fishinghouseholds (units)	721	1,067	502	2,290
2) No. of fishingboats (units)				
a) Non-motor	40	45	72	157
b)OBE type	-	4	5	9
c)IBE type	700	1,072	431	2,203
3)Catch (tons/year)	4,411	8,848	4,347	17,606

Source : Dinas Perikanan Tk. II (Tanjung Jabung)

Notes : OBE; outboard engine, IBE; inboard engine

In the coastal water of Jambi, numerous number of traditional fishing gears are operated by small-scale fishermen. Those gears can be divided into 3 categories based on the type of gears and operational grounds as follows:

Table 2.2.2 Traditional Fishing Gears Used in Coastal Water of Jambi

Category	Name of Fishing Gear	Major Operating Area
Tidal trap	Jermal, gombang, togok	Generally fixed within 3-mile from shore line including river mouth.
Mini-trawl	Lampara Dasar, Dogol	Operated in the more than 3-mile off shore line.
Lift net	Bagan	Fixed in the water depth approx. 10 m (more than 3-mile off)

Source : Based on the hearings at sites.

Out of the above, tidal traps (gombang, togok) and mini-trawl (lampara dasar and dogol) seems to put high pressures on fish stock in the coastal area. Those gears are small-scale so that those gears have been considered not to depress fish stock. However, because the large numbers of those gears are operated, and some are operated in the prohibited near shore grounds or without licence (about 40% of small-scale fishermen operates fishing without licence in Nipah Panjang), the recent catch of shrimp has been decreasing, and furthermore the size of shrimp/fish becomes smaller year by year. Shrimps caught in this area include both small shrimp (mainly for boiled/dried) and Penaeid shrimps (for fresh/frozen). One of the problems in the aspect of resources is that the catch includes juvenile shrimps in coastal area before they migrate into mangrove swamps. The number of traditional fishing gears, fishing

seasons and the major operational areas are shown in Table 2.2.3, 2.2.4 below and Figure 2.2.1 respectively.

Table 2.2.3 Numbers of Traditional Fishing Gears Used in Coastal Water of Kab. Tanjung Jabung, Jambi Province (1991)

Fishing Gear	Total catch (ton)	No. of Traditional fishing gears used (unit)			
		Muara Sabak	Nipah Panjang	Tungkal Ilir	Total
Bagan	949	41	35	20	96
Sero	1,219	27	96	12	135
Jermal	394	12	16	7	35
Gombang	646	-	95	59	154
Togok	1,755	62	40	90	192
Lampara Dasar	3,214	71	46	108	225
Dogol	2,031	120	80	40	240

Source : Dinas Perikanan Tk. II (Tanjung Jabung)

Notes: One unit of Togok consists of 4 nets.

Table 2.2.4 Major Fishing Seasons of Major Fishing Gears

Area	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct	Nov.	Dec.
North coast				=====								
				(Togok/Gombang/lampara dasar/Dogol)								
East coast	=====			=====				=====				
	(Gombang)			(Lampara dasar/Dogol)				(Trammel net)				
				=====				=====				
				(Monofilament gill net)				(Bottom line/gill net)				

Source : Based on the hearing at sites.

Notes: 1) North coast : between Kuala Tungkal and Nipah Panjang.

2) East coast : between Nipah Panjang and Air Hitam.

There are 14 fishing villages/towns in the coast of the project area, having about 2,290 fishing households (mostly are small-scale). The most of fishermen are engaged in shrimp fishing using traditional gears as described in the above. They are strongly tightened with private wholesalers (mostly chinese origin, so called as "Toke") by credit for purchasing fishing boats/gears and for general requisites, so that they are forced to land their catch to the respective "Toke"'s facilities. No other marketing channel is available in this area. The largest "Toke" is based on Air Hitam, the second and third ones are located in Kuala Mendahara and Simbor Naik respectively. Every village has at least 1-2 "Toke", and normally 3-5 large-scale "Toke" exist in each major fishing base. Their major dealing products are shrimps consisting of boiled/dried shrimps (Ebi) and fresh/frozen Penaeid shrimps at all places, and some high-valued fishes are also dealt by some "Toke"s. The salted/dried jellyfish (Ubur-Ubur) is also one of the major items in Kuala Tungkal. All products are designated for export.

Table 2.2.5 Marine Fish Landing Places/Villages in Kab. Kuala Tungkal

Kabupaten	Major Fishing Base	Fishing Villages	
Muara Sabak	Kuala Mendahara	Muara Sungailagang	
	Simbor Naik	Alang Alang	
	Kampung Laut	Sg. Lambur	
Nipah Panjang	Air Hitam	Kuala Sadu	
	Nipah Panjang	Sg. Iteh	
			Sg. Jambat
			Pamusiran
Tungkal Ilir	Kuala Tungkal	Kuala Betara	

Source : Based on the hearing at sites.

(2) Project Scope

Phase I: Master Plan Study : Coastal Fishery Resources Inventory Management and Enhancement

Applying the similar approaches and methodologies employed in the Coastal Resources Management Project in Cilacap, Central Java (financed by USAID), but more focusing on fisheries resources and shortening the study period for urgent implementation, the project area will be studied and appropriate fishery resources management plan including practical action plans will be prepared. The study will include the following:

- 1) Baseline Information - Profile preparation
- 2) Biogeographical Studies
 - a) Fisheries
 - b) Assessment of mangrove
 - c) Water quality
 - d) Sedimentation
- 3) Socio-economic Studies
- 4) Legal and Institution
- 5) Resources Management Plan Formulation
 - a) Guidelines and Policies for Coastal Resources Management
 - b) Formulation of a Action Plan for Management
 - c) Formulation of Management of Marine Potential Area
 - d) Formulation of an Integrated Coastal Area Management Plan

Phase II: Research and Implementation

1) Component 1 : Artificial Reef Installation

The Project is aimed at the creation of new fishing grounds, particularly for the export-purposed high-valued demersal fishes such as groupers, snappers and pomfrets. The installation of artificial reef will be proposed for achieving this objectives. The most appropriate sites for artificial reef will be around Berhala Island and Beralas Island. Since no experiment on artificial reef has been made on practical basis in Indonesia, the research and development activities will have to be sufficiently conducted by referring other countries' similar activities and results such as in Japan and Thailand. The following are major research and development activities to be conducted.

- a) Selection of new fishing grounds to be created and sanctuary areas and seasons to be set up in terms of resource conservation, based on the result of Phase I Study.
- b) Designing of most appropriate artificial reef structures to be installed.
- c) Construction and installation of model artificial reefs.
- d) Observation of fish aggregating effects and socio-economic return.

2) Component 2 : Aquaculture Demonstration

a) Construction of Aquaculture Demonstration Farms

The Project will include the establishment of coastal aquaculture demonstration farms at 4 locations of Tanjung Jabung, namely, Tg. Labu (Kec. Tungkal Ilir), Alang-Alang (Kec. Muara Sabak), Nipah Panjang and Air Hitam (Kec. Nipah Panjang). In addition, if the inter-provincial coordination can be made, one shrimp hatchery of about 50 million pcs. (PL5) per year will be established at Pulau Berhala (Riau) to supply necessary postlarvae to small-scale farmers in Jambi.

i) Tg. Labu

Dinas Perikanan Tk. I (Jambi) has just started the operation of his own demonstration ponds for brackishwater shrimp culture (tambak, 0.5 ha x 2 ponds) since June 1992. About 700 ha of the coastal area (presently covered by coconuts trees) in Tg. Labu was surveyed and the detailed design was prepared by a local consulting firm, PT. Linggogeni, aiming at tambak development under a NES scheme including transmigrants from Java. However, the prospective private companies have not been found as of July 1992.

In addition, shellfish demonstration farm will be newly prepared, one for bloody cockle propagation ground and the other for oyster culture by stalk method. Both would be effective not only to increase shellfish resources but also to indirectly reserve the habitat areas of shrimp larvae/fish juveniles as sanctuary zone.

ii) Alang-Alang

The coastal area between Alang-Alang and Kampung Laut will be suitable for development of extensive or semi-intensive types of tambak for small-scale farmers, since the land is presently flat with a few trees and does not form hilly shape so that it is easy to employ a tidal gate system only for exchange of pond water. The available land area is roughly estimated about 1,000 ha (7 km x 1.5 km), and the existing coastal mangrove swamp of about 500 m in wide from the shore-line will be kept as a buffer zone. There is one small shrimp pond (0.25 ha) operated by a key-farmer entrusted by Dinas Perikanan.

In order to develop the most suitable shrimp culture technique and to extend to small-scale farmers/fishermen in this area, the demonstration farm (1 ha/pond x 4 ponds) with a field station will be opened by Dinas Perikanan. The nursery tanks to rear shrimp larvae up to PL20 - 30 (stocking size for small-scale farmers) will be also constructed in same site.

The coastal beach will be kept as bloody cockle propagation zone for experiment (about 100 ha).

iii) Nipah Panjang/Air Hitam

At present, there are only about 20 ha of tambak in Kec. Nipah Panjang. No Dinas Perikanan's experimental or demonstration farms exists as of today. Traditional shrimp gears such as gombang and lampara dasar are most abundantly operated in this area. The introduction of tambak at early stage will be prospective.

The demonstration farms of shrimp pond culture (1 ha/pond x 4 ponds) and bloody cockle propagation grounds (about 100 ha) with a field station will be established in Nipah Panjang and Air Hitam respectively.

b) Detailed Survey and Designing for New Tambak Development

As of June 1992, the following areas have already been surveyed and designed for new tambak development by a local consulting firm.

- i) Tg. Labu : About 700 ha
- ii) Nipah Panjang : About 200 ha

Other areas, such as Alang-Alang (about 1,000 ha) and Air Hitam, particularly for small-scale farmers/fishermen, should be surveyed and designed as soon as possible.

2.2.6 Phasing

(1) Master Plan Study

About 42 man-months of consulting services covering fields of socio-economics, legal & institution, fishing village community, fishing gears & methods, fishery resources, aquaculture, mangrove ecology, soil mechanics, and land use & environment, will be required for the Study. The study will take about 8 months.

(2) Research and Implementation

1) Research

The research work will be undertaken for 60 months on the project-type technical assistance basis, with participation of the following technical expertise.

- a) Team Leader/Artificial Reef Planner 60 M/M
- b) Artificial Reef Engineer 36 M/M
- c) Seafarming & Aquaculture Expert 24 M/M
- d) Fish/Shrimp Seed Production Expert 24 M/M
- e) Socio-Economist/Institution 36 M/M

2) Implementation

Since the proposed project is natured in the research and development and the large part of benefits are relied to socio-economic matters, the Project had better be implemented on grant or soft loan basis. Implementation of the Project will be commenced after completion of a 24-month research activities. It is expected that about 36 months will be required for construction and operation of aquaculture facilities as well as artificial reefs. Monitoring survey using a underwater TV camera will be also conducted to identify the effects of artificial reefs.

2.2.7 Cost Estimation

1) Phase I: Master Plan Study		
a) Consultants	42 M/M	US\$630,000
b) Counterparts		US\$100,000
c) Survey Expenses		US\$270,000
	Sub-Total	US\$1,000,000
2) Phase II: Research and Implementation		
a) Research Work		
i) Experts	180 M/M	US\$1,800,000
ii) Equipments		US\$1,200,000
	Sub-Total	US\$3,000,000

b) Implementation	
i) Artificial reef	US\$4,000,000
ii) Aquaculture demonstration	US\$1,000,000
	<hr/>
Sub-Total	US\$5,000,000
Total Cost	US\$9,000,000

2.2.8 Appraisal

(1) Technical

The artificial reef installation would be the first-experience in Indonesia. Technically, Japan has the longest history on its development in the world. Even in the Southeast Asian countries, the research and development on artificial reefs have been experienced in Thailand by the JICA-supported project-type technical assistance, "Eastern Sea Board Marine Fisheries Resources Development Project" based in Rayong, in collaboration with the Southeast Fisheries Development Center (SEAFDEC) since 1986. Some experiences and knowhow accumulated in Japan and Thailand can be applied to the project area.

As for aquaculture demonstration, there seems to be no technical problem in the course of implementation. The use of either intensive or extensive culture methods should be carefully determined based on the local conditions with particular emphasis on natural environmental conditions and the participants' technical level.

(2) Economic

The Project is expected to generate new fishing grounds as well as new shrimp production grounds (tambak) for small-scale fishermen. By the promotion of these project activities, the fishing efforts in the problem area will be mitigated and will contribute in recovery of the fishery resources for better and more sound fishing activities. In addition, the Region may increase the export of fishery products in the long-run.

(3) Social

All the people who are engaged in fishing, fish handling and marketing in the coastal water of Tanjung Jabung are expected to receive the benefit from increase of fish/shrimp production. Although their catch may decrease once for several years after moving to new fishing grounds and/or conversion into tambak, fishing environment including fishery resources condition in the project area would be greatly improved and fishermen's income would be much higher than the present, in the long-run.

(4) Environmental

The proposed project would accelerate the development of brackishwater shrimp culture (tambak) in the coastal area. The areas selected for tambak are generally located in the just backyard of coastal mangrove forest. With the appropriate coastal zone management, no destruction of mangrove forest will be occurred in the future.

(5) Financial

The Project may not be financially feasible since it needs much time for research and development activities. During the implementation of the Project, the artificial reefs would be designed and installed on experimental basis. Based on the results of these experiments, the financially feasible artificial reefs development would have to be made.

2.2.9 Major Preconditions and Recommendations

(1) Technical Aspects

Technologies to be employed for artificial reefs development are based on the experiences and knowhow accumulated in Japan and Thailand. However, the most suitable designs and models will be prepared taking into account fishing activities, resources conditions and socio-economic situations in local areas.

Although most of new tambak developed in Indonesia are more or less apt to be intensive, it is a heavy burden for small-scale farmers to operate the intensive ponds without a support from private companies under a NES scheme. The project areas would generally seem to be rather suitable location for development of extensive or semi-intensive culture ponds using the primary productivity.

If considered the conversion of fishermen to tambak farmers, it would be converted on step-by-step basis. That is, they would be provided with a small extensive pond as initial step, but they still continue to do fishing at this stage. In accordance with their experiences, tambak areas would be gradually enlarged and finally they would be fully converted to tambak. In this approach, the intensive ponds may not be suitable for them, since they are not afford to purchase enough feed and seed.

(2) Trade and Marketing Aspects

Due to the low productivity of fishes in the coastal water, fish prices are generally expensive in local markets, where a lot of cheaper fishes from Medan and Padang are also dealt. Considering this situation as well as resources condition, the export-oriented fishing/farming should be more emphasized with the increase of high-valued export fish/shrimp resources.

As for collection and distribution of export commodities, about 80% of exportable shrimp/fish are once sent to outside of Jambi, Tanjung Balai Kalimun (Riau) and Palembang (South Sumatra). The number of local shrimp/fish collectors in the coastal areas of Tanjung Jabung are too many for dealing the stagnating catch of shrimps, and small quantity of shrimps per collector cannot be directly exported to Singapore/Malaysia because of a high marketing cost. If the shrimp/fish collectors can cooperate each other by forming an middlemen's association, the transportation cost may be largely reduced and more value-added products can be locally produced so as to develop the regional economy.

(3) Environmental Aspects

As mentioned earlier, the coastal water environment is closely related to the river water flow both in quality and quantity. The heavy deforestation in the upper stream has been causing the sedimentation that reduce the habitat area of fish/shrimp larvae. The growing pulp making industry in Kab. Tanjung Jabung may bring a danger to drain the polluted substances directly to the nearby river without appropriate treatment. It is feared that these matters would sometimes damage fisheries resources in river and the effect would spread into coastal water. It is strongly recommended that the relevant government agencies should be cooperated each other to strictly control the permitted private companies' activities.

(4) Community Aspects

It would be indispensable to make all the people related to fishery industry understand the importance of resources management and raise their own intention to manage the coastal water by themselves. For this purpose, all the local people should be participants for the project directly or indirectly, and more frequent discussions and meetings with shrimp/fish collectors (Toke) including small-scale fishermen would have to be made prior to actual implementation.

(5) Legal and Institutional Aspects

It is strongly recommended that the government should more strictly control the numbers of fishing gears used in the coastal water. Especially, those related to shrimp fishing using tidal trap-nets and mini-trawls (lampara dasar and dogol) which are deemed to cause the damage to shrimp/fish resources should be carefully controlled not to provide any more permits. This is the most important condition to be kept prior to the implementation of the Project.

However, the Project may have a danger to cause social conflicts between local people and the government if the existing fishing activities are strictly controlled through only the enforcement of laws/regulations. From the project preparation stage, the local community should be participated in the project to concretely discuss on the legal and institutional measures to be taken in the project area.

(6) Financial Aspects

The installation of artificial reefs usually costs expensive against its economic return. Particularly in the developing countries where fish prices are relatively low, this trend would be more remarkable. The use of cheap local materials for construction of reefs are nevertheless to say, and the possible financial support from the government would be indispensable.

3. INDUSTRY

3.1 DEVELOPMENT OF INDUSTRIAL ESTATES (I.Es.)

3.1.1 Objectives of the Project and Its Role in the Regional Development

The objective of this project is to develop infrastructure intensively in some limited area of the Region, where infrastructure are generally insufficient, to provide a set of infrastructure for potential investors, and, as a result, to promote investment from both domestic and abroad.

Subsidiary aim of developing I.Es. is areal development through the promotion of processing industry and accumulation of local small scale enterprises by providing such common service facilities as pollution control to minimize their investment.

There are three stages in the development of I.Es. :

- 1) Planning stage conducting pre-investment or feasibility study for decision making,
- 2) Implementation stage comprising contracting, engineering and construction, and
- 3) Operation stage with the location or settlement of investors and administration.

In the Region, there exists one I.E. -- Lampung I.E., which is in its operation stage and subject to implementing promotion for more investment.

Another I.E. is under investigation in the outskirts of Palembang, although the concrete location was not decided yet as of end August 1992, among candidate places of Mariana, Sungai Lais, Kertapati and Tg. Api Api. When the decision is made, it will enter into the planning stage mentioned 1) above to establish the master plan of development of the I.E.

3.1.2 Location

- 1) South Lampung (Lampung I.E. for expansion)
- 2) Palembang (New I.E. for development)

3.1.3 Executing Agency

- 1) Ministry of Industry/KANWIL
- 2) Provincial Government/Dinas Perindustrian
- 3) BKPM

3.1.4 Expected Benefits

- 1) Increase of direct foreign investment
- 2) Up-grading resource oriented, secondary processing industry in the Region- more processed, more value added products, higher technology level;
- 3) More output value in industry sub-sector.

3.1.5 Outline of the Project

(1) Planning Stage

This stage covers following preparatory works:

1) Industrial Potential Analysis

The analysis of available resources has the first priority because the processing of these resources forms the main frame of industry in the Region. The investigation of physical and human resources for industrial enterprises covers raw materials (agriculture, forestry, fishery, mining), industrial intermediates, and labour (not only quantity but also quality). The potential investors who will advance to this Region have keen interest on these points as well as transportation and utility conditions.

Secondly comes the analysis of such infrastructure like utility (electricity, water, sewage), road and railway transport, navigation and aviation as well as telephone, facsimile and telex communications. The condition or the industrial structure such as supporting industries of the core city and its hinterland is also the aim of the analysis.

2) Investment Analysis

The analysis must reveal investment conditions in the industrial sector of the Region as a whole, of each province, and of each core city. Furthermore, it must give future prospects of industrialization in the area as well as the short and medium term demand for industrial land. The investigation of the investment potential should start with an identification of the ability and willingness of manufacturers, commercial people and bankers to invest in industries of the area. It will be followed by a survey of the investment trend and behavior of foreign investors. It also to be examined if and how direct Government investments in industrial projects like LIPI project in Lampung I.E. influence the industrial development.

The analysis also distinct the probable demand for industrial land by the term of requirement and by investment scale which represents the size of land.

3) Location Analysis

In case of the under investigated I.E. in Palembang, it has already four alternative locations. Following five factors are the world prevailing criteria for assessing I.E. projects:

- a) Topography: location to and from the core city, size and form of the area, morphology, present utilization of the area, climate (e.g. wind);
- b) Geological and hydrological conditions: type of soil, bearing capacity, necessity of drainage, required for levelling and filling;
- c) Legal situation: ownership, special rights (e.g. military), illegal occupation (e.g. squatters);
- d) Political / administrative aspects: administrative responsibility, status within regional planning (e.g. master plan); and
- e) Economic factors: proximity to main road, to railway line, to port and airport; conditions of water and energy; availability of manpower and proximity of housing areas; cost of land (purchase of raw land as well as development cost).

Investors, especially from foreign countries, select their factory location through internationally comparison by applying following criteria:

- a) Geographical location---access to raw materials source, products market and related government agencies like BKPMD, custom and labour office, etc;

- b) Distance from sea / air port and access road condition (width, pavement and traffic volume) ;
- c) Availability of utilities (volume and stability);
- d) Availability of communication facilities;
- e) Availability of labour (quantity and quality or skill) / availability of middle class managers or middle class engineers;
- f) Development policy of local government; and
- g) Incentives.

4) Site Analysis

A development strategy and layout plan for the recommended location must be outlined. The plan includes information on the adequate use of the total area, road and utility systems, plots to be offered, Standard Factory Buildings (SFB) and warehouses. They should be based on results of the industrial potential analysis described 1) above and empirical data of similar projects in surrounding countries like Malaysia, Thailand and the Philippines.

The development strategies of almost all I.Es. are principally the same. The total project is broken down into realistic individual phases starting from demand estimation of industrial land, forecast of occupancy rate and speed, implementation plans for on-site infrastructure to be developed, land purchase and land use. Development of the industrial estate must be integrated into the overall urban planning.

5) Implementation Scheduling

The feasibility study must show the implementation schedule. Its main objective is to indicate the sequence of activities to be performed from the decision on the implementation of the industrial estate project to the start of its operation. Definite time schedules with exact steps of activities cannot be determined until a basic decision to implement the project has been made. The time indications at this stage are needed for the financial and economic analysis described 7) below which is a part of the feasibility study.

6) Organization Analysis

The organization structure has to be developed. It usually comprises the management structure of the I.E. and its institutional setup.

The total project can be divided into following five functions:

- a) **Planning:** The project must be planned in technical detail and subsequently the area must be developed according to the plans;
- b) **Operations:** This requires the acquisition of land, a permanent control and supervision of the implementation. The requests from the estate applicants and tenants have to be dealt with in an adequate manner. All utility, maintenance and general technical problems have to be solved;
- c) **Marketing:** Persuade the potential investors through various promotional activities to locate in the I.E.;
- d) **Finance:** The planning, operations and marketing activities have to be financially planned, controlled and registered;
- e) **General management:** All functions have to be adjusted to the requirements of the total project and harmonized accordingly.

7) Financial and Economic Analysis

The financial and economic analysis for all I.E. projects is regularly based on the recommended implementation rationale or development strategy for the project. It comprises cost and revenue considerations, a corresponding cash-flow and profitability calculations, often in the form of the Internal Rate of Return (IRR) method. Above preparatory works to form the master plan of developing an I.E. will usually done by some integrated committee consist of representatives from related official organizations and from private sector with support rendered by some consultants.

The master plan will be submitted to Ministry of Industry for approval. After the approval, the committee will nominate a contractor or developer through a bidding. As contractor, such experienced engineering companies from Singapore and Japan who have developed I.Es. in neighbouring countries are recommended. The contractor starts project engineering. When the engineering has been completed and approved by the committee, the implementation stage will start.

(2) Implementation Stage

This stage covers following works:

1) Allotment of Land

Already acquired or planned total land for an industrial estate should be allotted according to the usage and to development phase. Land allotment by usage means how much land will be used for industrial area, on-site road, administrative buildings, common service facilities and green. Land allotment by phase is also necessary because of limitation of development fund. Generally, the phases will be divided to three to five. Fund allocation for development is top-heavy because of the necessity of investment for "public" facilities.

2) Site Preparation

This is core work of implementation stage. The clearing and filling activities will be much influenced by geographical features and soil conditions. In swampy area, a lot of soil have to be moved from mountaineous area, which push up the land preparation cost.

Not only on-site roads construction but also that of access road to the I.E. are inclusive in site preparation. Both kind of roads should be designed to bear the weight of 40 footer container trailer.

3) Water Supply

Following two kind of facilities are necessary:

a) Water intake / water pumping and storage facilities

Provision of the water for industrial, drinking and fire fighting use inside the I.E. is to be carried out in each phase of development.

b) Water distribution facilities

After making estimation of the total amount of water consumption, piping diameter and water pressure from the elevated water tank is to be decided.

4) Power Supply

Two kind of supply souce ---PLN and stand-by generator ---should be secured for stable operation of locators in the I.E.

5) Communication Facilities

As communication tool with world market, Long Distance Direct Dial Lines (LDD Lines) are of necessity. Facsimile will convey not only commercial information but also design and drawings of products. Besides, a telephone exchange and local lines should be provided.

6) Sewage and Drainage Facilities

Two lines of sewage and drainage facilities should be provided. Sewage line accomodates waste from the factories, domestic waste and waste from other facilities besides the factories such as the I.E. administrative offices, etc. Liquid waste from the factories is discharged into this line after passing through the treatment facilities of each factory. Rain which falls on the road surface is collected in the roadside drain mouths and from there is carried by drainage lines. The central waste water treatment facilities should be provided to prevent from pollution.

7) Soild Waste Disposal

Incinerator equipment for soild wastes from the factories and administrative offices should be provided and disposal measures for metal waste should take into consideration. Smells, ash and smoke from the incinerator causes the environmental complaint, so some countermeasures for this should be taken appropriately.

8) Perimeter Fencing and Securities

As fencing will play an important role in the protection of company equipment, capital goods, products, etc. and for the safety of employees its provision is essential. In addition to assuring the security of employees and tenant enterprises, a through check is to take place at gates of movements in and out and regular patrols checking perimeter fencing and common service facilities.

9) Standard Factory Building (SFB)

SFB with following furnishings should be provided mainly for medium and small enterprises:

- a) Floor area of 1,000-3,000 sq. meter in size suitable to the scale of equipment of the companies served (two- or three-story buildings);
- b) Sufficiently durable construction to endure natural contingencies;
- c) Well finished floor (thickness, flatness, wiring, pipe gutters);
- d) Doors of adequate width for moving machinery and equipment; and
- e) Good ventilation

In parallel with physical works of construction, such institutional work like getting approval of "bonded zone" is necessary for gathering export-oriented enterprises.

(3) Operating Stage

After the complementation of development, the I.E. enters to operating stage. In this stage, there are two main aspects:

- Marketing of the I.E. to prospective investors, and
- Management service for the locators.

1) Marketing of the I.E.

The objective of marketing an I.E. to get prospective buyers or investors who purchase plots or rent building space, within planned settlement period, at preliminary set or listed price or renting rates, with a minimum sales efforts and cost. The success of any I.E. project will be judged by its occupancy rate. This occupancy rate shows the results of accumulated efforts throughout planning stage, implementation stage and this operation stage.

As I.E. is one from of merchandise, there exists marketing components like "competitive price", "sales points", "buyers" and "seller".

a) Competitive price

I.Es. in Southern Sumatra will meet price competition against those in West Java where more than ten I.Es. are under developing by private developpers. However, tentative offered land price of several I.Es. developed in Bekasi is around US \$ 40 per sq. meter, some 10 times higher than that of Lampung I.E. As far as land price is concerned, I.Es. in the Region can be said highly competitive.

b) Sales points

Among many factors, described in (1) - 3), what determine I.E's fortune most is its geographical location --- access to raw materials source, products' market, distance from sea / air port and access road. Enterprises have to pay daily transportation cost which consists of that for raw materials and for products. In case of resource oriented processing industry which is the most prospective in the Region, volume of raw materials is usually 3 to 5 times of that of products. So many processors want to locate in the resource source in order to minimize their transportation cost. Typical examples are cassava starch processors, palm oil processors and rattan processors.

So, I.Es. which locate in the Region have to stress on this advantage --- proximity to raw material source --- compared against I.Es. locate in JABOTABEK.

c) Buyers

Prospective buyers of I.Es. come either from domestic and abroad. In case of foreign, target countries are Singapore, Taiwan, South Korea and Japan, etc. which are now importing raw or semi-processed materials from the Region. Many of processors in those countries are gradually losing the viability of their business because of increase of labour cost and considering relocation of their factories in some place where they get cheaper labour cost. To make contact with them, it is effective to get cooperation with the Chamber of Commerce and Industry, financing organizations like commercial banks and semi-governmental organizations like JETRO (Japan External Trade Organization), KOTRA (Korea Trade Promotion

Cooperation) and CETRA (China External Trade Development Council ---- Taiwan) of each country.

d) Seller

All of the agencies listed in "3.1.3 Executing Agency" have scarce experience in sales of merchandise. They lack sense of sales. It is recommended to invite one sales manager from private sector who has experience as salesman of such real estates like housing. Also it is recommended to learn from private developers of I.Es. in JABOTABEK how to form sales tools like brochures, data for explanation, price list, etc.

2) Management Service for Locators

This is a kind of "after-sales service" for the buyers of the I.Es. which includes whole activities to be rendered for the locators in order to let them feel helpful for their daily production activities.

It includes:

- a) Administrative works
 - i) Collection of public fees and costs,
 - ii) Approval of official applications,
 - iii) Tariff and tax related practice, etc.
- b) Maintenance works
 - i) Operation of such public facilities like water in-take, stand-by generator, telephone exchange, etc,
 - ii) Security,
 - iii) Maintenance of on-site road, sewage and drainage system, etc.
- c) Recruitment works
- d) Coordination works with the community

This type of service activities offered by operating entity are the main concern for the locators. Generally, private sector is more suitable for this kind of service activities. However, in case of Lampung I.E., tripartite organization called "BPSKAIL" is in its duty.

3.1.6 Phasing

Experience shows it usually take five to six years --one to two years for planning stage, two to four years for implementation and operation.

3.1.7 Cost Estimation

Experience of development of I.Es. in JABOTABEK area shows that the budget for development 200 ha of I.E. will be between US\$ 10-18 million excluding land price. Among them, engineering fee which is paid to consultants is estimated between US\$ 0.3-0.5 million.

3.1.8 Major Preconditions and Recommendations

Lampung I.E. is in its operation stage and another one is under investigation in the vicinity of Palembang. Followings are general description of Lampung I.E:

(1) Location (address)

Sindang Sari, Kec. Tanjung Bintang, South Lampung (14 km from port of Panjang and 20 km from Bandar Lampung).

(2) Development Area

Total planned development area is about 300.24 ha. The development schedule has four stages :

Stage I	102.16 ha (including LIPI's 25 ha)
Stage II	35.08 ha
Stage III	90.00 ha
Stage IV	73.00 ha
Total	300.24 ha

(3) Infrastructure and Utilities

- 1) On - site road --- 1940 meter in hot mix pavement
- 2) Water supply --- 30 lit. / sec. clean water,
one 1,200 cubic meter resevoir,
two gimled well
- 3) Drainage --- 4,170 meter type S III drainage
- 4) Electricity --- 2 x 8 MW from PLN
- 5) Telephone --- 25 channels (reserved),
STSD with 500 SS (planned)
- 6) Security --- security man prepared,
2 burning hydrant.

(4) Locators Who Decided to Enter Lampung I.E.

- 1) LIPI's mineral solution factory,
- 2) A ginger processor for export,
- 3) An activated carbon processor from coconut shell, and
- 4) An instant coffe processor for export.

3.2 IMPROVEMENT OF VOCATIONAL TRAINING CENTERS (VTCs)

3.2.1 Objectives of the Project and Its Role in the Regional Development

The objective of this project is to upgrade and expand education of industrial technology in the Region in order to meet the increasing demand for specialized manpower, especially for middle class managers and engineers, in industry field.

As resource oriented, secondary processing industry which aim to process more on natural resources produced abundantly in the Region become one of the targets of regional development, to secure and to level up skilled labour is the essential role for the regional development.

3.2.2 Location

Interprovincial

3.2.3 Executing Agency

- 1) Ministry of Manpower / KANWIL
- 2) Provincial Government / BAPPEDA

3.2.4 Expected Benefits

- 1) Human resources development through level up of skilled labour
- 2) Increase of labour absorption to production sector
- 3) Provision of more income to the Region

3.2.5 Outline of the Project

Different from other projects, the main frame of this project has established and having been implemented for a decade. So, followings are a series of suggestions and recommendations for improvement of the system:

(1) Function of VTCs

According to the publication from Ministry of Manpower (MOM), one of its roles is "Developing a skilled, disciplined and productive labour force". For the fulfilment of its role MOM provides 13 vocational courses in its standard curriculum, and in each province, Regional Manpower Office selects the province's own courses, taking into consideration the demand for skill of each region. The selection is usually conducted mainly by BAPPEDA, Regional Manpower Office and local Regency Manpower Office. However, it is pointed out that there exists some discrepancy or gap between the needs of the region and the "supply" -- both in type and the level of skill achieved -- which causes minimum utilization of VTCs' graduates.

It is recommended for above mentioned organizations to make "market research" for the needs of the Region with cooperation from such organizations as Ministry of Industry (KANWIL), Ministry of Agriculture (KANWIL) and KADIND, etc. From that point of view, if BLK Palembang specialized in welding and lathe course for the budget year of 1992/93, after the consideration of the requirement from industrial community, where the production of metal products is growing, it may be highly evaluated. At the same time, it is an unique and good try to add a new training course of "Hotel" in BLK Bandar Lampung where 4 star-classified hotels and 13 non-star-classified hotels are already servicing, which meets the needs of the Region and also fits the trend of tourism promotion. In another case, the fact that the rate of trainees of Agriculture course shares 20-30% of total number of trainees in 3 VTCs in Lampung, might show the high needs for the training.

(2) Re-classification of VTCs

In Indonesia, there are 153 VTCs, classified to 4 types:

- 1) 33 type A VTCs in 26 provinces,
- 2) 16 type B VTCs in 12 provinces,
- 3) 44 type C VTCs in 19 provinces, and
- 4) 60 type new C VTCs in 25 provinces.

Type A and type B are usually called BLK (Balai Latihan Kerja --- Vocational Training Center) and both type C and new C are called KLIK (Kursus Latihan Kerja --- Vocational Training Course).

In the Region, there are 18 VTCs -- 5 BLKs and 13 KLIKs -- as shown in Table 3.2.1.

According to MOM's decree (Kep. 181/Men/84), these types have some difference. However, from outsider's eye, they have scarce difference:

- 1) BLKs are usually located in provincial capitals and KLIKs in Kabupaten capitals;

- 2) In terms of capacity of trainee BLKs are usually bigger than KLKs; and
- 3) KLKs have basic training courses and MTUs (Mobile Training Units).

Table 3.2.1 List of Vocational Training Centers (BLK) and Vocational Training Courses (KLK) in Southern Sumatra

Province	Name of VTCs (BLK / KLK)
Jambi	BLK Jambi
	KLK Rimbo Bujang
	KLK Sungai Penuh
	KLK Sirolangun (4 VTCs)
South Sumatra	BLK Palembang
	KLK Lubuk Linggau
	KLK Baturaja
	KLK Pangkal Pinang
	KLK Indralaya
	KLK Sekayu
	KLK Prabumulih
	KLK Lahat (8 VTCs)
Bengkulu	BLK. Bengkulu
	KLK Manna (2 VTCs)
Lampung	BLK Bandar Lampung
	BLK Kalianda
	KLK Way Abung
	KLK Metro (4 VTCs)
Total	(18 VTCs)

Source: Dept. of Manpower "Vocational Training at VTCs" (1989).

It is recommended to call all BLKs and KLKs in one word BLKs, in order to avoid mis-understandings that there is two different types of VTCs, of which English name has already become one "VTCs". Or, it is recommended to re-classify these two to:

- 1) BLK for training of productive labour for highly productive industrial field,
- 2) KLK for training for job seeker or training for self-employer and for primary production sector like agriculture, forestry and fishery.

(3) Separation of Trainees

There seems to be two types of prospective students:

- 1) One who wants to join or be employed to established enterprises after graduation of VTCs; and
- 2) One who starts his own job or joins to family enterprise after getting some technology. The typical cases are agriculture, car and electric appliances repairing, sewing.

It is recommended for the former category, the requirement of alumni of Senior High School is necessary beside good physical and citizenship condition. Also, entrance examination to check wheter he or she has basic ability in mathematics and English to endure high grade training is necessary. On the contrary, in case of the latter, the requirement should be lowered to alumni of Elementary School.

What is recomended here is to form two level of trainings in corresponds with the requirement of the occupations:

- 1) Higher level training for potential employees for the enterprises, and
- 2) Basic level training for self-employed.

"Higher level" here means integrated training not only in level, but also length (at least one year) of training.

(4) Level-up of Instructors

Number of instructors for VTCs looks sufficient so far, judging from the figures in Lampung (Table 3.2.2), where average number of trainees for one instructor is 15, with the range of one to four to one to 90. There is no available data for their capability, but it is pointed out that most of them lack of their experience in business world. In order to level up the quality of instructors, two-years training course in CEVEST (Central Vocational Extension Service for Trainers) was opened already.

It is recommended to invite specialized instructors from outside. For example:

- 1) Language experts from near-by universities or colleges
- 2) Technology experts from Institutes for R&D of Industry; and
- 3) Top managements of enterprises to lecture actual business way of thinking.

Table 3.2.2 Actual Number of Trainees and Instructors in Lampung (1991/92)

<Trainees>

Type of Training	Bandar Lampung	Kalianda	Metro	Way Abung	Total
Mechanical	63	83	20	44	210
Automotive	91	80	60	76	307
Electrical	40	80	80	63	263
Construction	80	40	40	44	204
Commercial	21	-	-	22	43
Various Vocation	67	46	80	90	283
Agriculture	42	80	80	143	345
Hotel	46	-	-	-	46
Total	450	409	360	482	1,701

<Instructors>

Type of Training	Bandar Lampung	Kalianda	Metro	Way Abung	Total
Mechanical	10	3	2	2	17
Automotive	11	3	7	2	23
Electrical	11	2	7	3	23
Construction	7	4	5	2	18
Commercial	5	1	-	3	9
Various Vocation	4	1	2	1	8
Agriculture	3	5	3	3	14
Total	51	19	26	16	112

Source: Regional Manpower Office, Lampung

(5) Upgrading of Facilities

It is often pointed out that machine and equipment of VTCs are too obsolete and outdated to train trainees who will go out to meet modern facilities which are commonly used in

business or production practice. This forms one of technology gaps between VTCs and actual business world.

One example can be seen in Office Secretariat course in BLK Bandar Lampung, where manual typewriters are still in use at present, while actual business world requires electric typewriter and computer skilled operators. In BLKs Bandar Lampung and Kalianda, there are no boarding house facilities. So, prospective students who live far from cities have scarce opportunities to attend the training.

All of these upgrading of facilities depend on the Central Government's Development Budget (APBN). However, it will be worth while to ask business world of the Region like KADIND to donate the funds for purchase such facilities or to donate already depreciated machine and equipment.

(6) Job Placement of the Graduates

It is said very difficult to monitor the employed graduates through questionnaire survey, so there is no statistical data to show actual situation of graduates. At present, graduates can obtain information on job vacancy at the local manpower office. It is also said there are many cases of self employment. It sounds very curious because MOM has also the important function of job placement -- coordination activities to introduce proper skilled labour to the labour market.

It is recommended to strenghten the job placement activities for newly established enterprises with the cooperation of BKPMD and Ministry of Industry (KANWIL). BKPMD can firstly catch the information of new investment and get expected number and quality of labour required in advance. Ministry of Industry has also advantages to know the same kind of information. Getting such kind information from said organizations, sales activity by local manpower office starts, carrying a list of qualified graduates from advanced courses. This activitiy will enable to get two birds with one stone -- to get trust from new enterprises for good quality of labour and also to get appreciation from graduates for good jobs.

It is also recommended from macroscopic point of view, to establish a manpower planning and budgeting organization at provincial level in order to meet the regional needs for industrial manpower.

(7) Effective Use of Budget

Table 3.2.3 shows present working rate of VTCs in Lampung. Average working rate is a little bit higher than half of the capacity. This phenomenon is, explained as, caused by the limited APBN budget allocation. Standard training hours (1 training hour = 45 minutes) for most of training courses are 600 hours. While actual figures for VTCs are usually 480 hours, some 80% of the standard. This also is explained because of said budget limitation.

Table 3.2.3 Working Rate of VTCs of Lampung Province (1991/92)

VTC	Training Capacity (A)	Actual Number of Trainee (B)	Ratio (B/A)
Lampung	1,200	450	37.5 %
Kalianda	800	409	51.1 %
Metro	600	360	60.0 %
Way Abung	600	482	80.3 %
Total	3,200	1,701	53.2 %

Source: Regional Manpower Office, Lampung

It is the dilemma for MOM to train as many job seekers as possible (target figure shown is 700,000 in national level) and to give them high quality of training with limited budget. However, the gap between the needs of the region and supplied skill is pointed out as described in (1) above. Merely supplying unwanted quality of labour is the waste of time and money.

It is recommended to cut down the number of higher level trainees described in (3) above, and to give the pick more advanced and long term training which meets the needs of industry of the Region. Number of basic level trainees remains same as present.

(8) Suggest Additional Curricula

The more industry developed, the more skills and knowledges required. Such curricula as follows are suggested to add to present one for give the trainees more practical knowledge than universities where they tend to theoretical training:

- 1) Raw materials,
- 2) Processing technologies,
- 3) World market situation,
- 4) Products Quality Control (QC),
- 5) Products checking,
- 6) Cost calculation / depreciation,
- 7) Stock control,
- 8) Computer system and its application for management,
- 9) Personnel management, and
- 10) English as the most universal communication tool.

3.2.6 Phasing

(1) Pre-investment Study

Feasibility study for investigating required facilities for improvement and renovation and for estimation, etc. is necessary which will take half a year.

(2) Implementation

When the budget for improvement and renovation settled, it will take one to one and half year for whole installment.

3.2.7 Cost Estimation

US \$ 28 million for 18 VTCs of the Region

3.2.8 Major Preconditions and Recommendations

Already commented in 3.2.5 above.

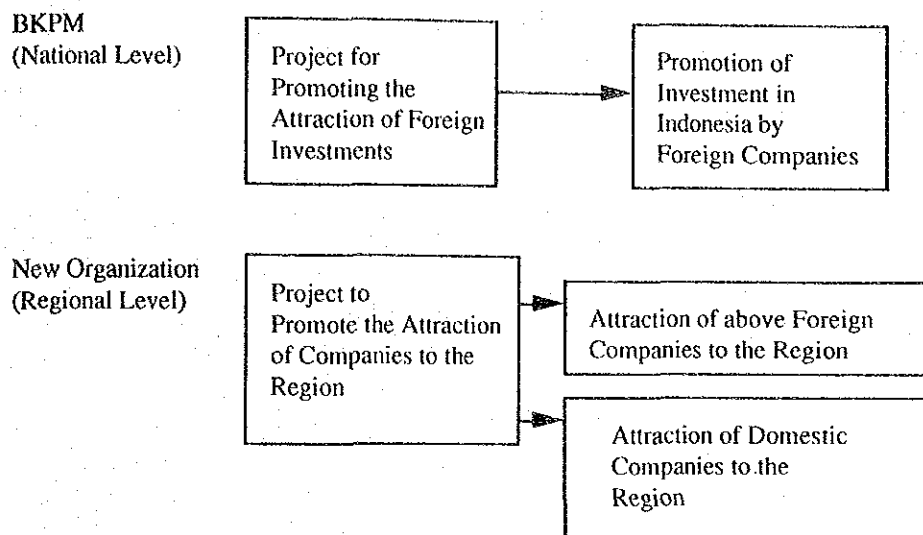
3.3 INVESTMENT PROMOTION

3.3.1 Objectives of the Project and Its Role in the Regional Development

The objective of this project is to promote investment for location of factories into the Region. Nevertheless for foreign investors the decisive issue is evaluation of the Indonesia in comparison to other ASEAN countries. Therefore it is proposed to undertake the project for foreign investment promotion by means of two programs; firstly, the overall general program to promote the foreign investment which will be implemented by the BKPM on a national level, and secondly, the promotion program for the Region which will be implemented by the new

organization described in 3.3.3 below to convince foreign investors to locate their factories in the Region. For domestic investment, to promote investors to locate their factories in the Region would be necessary. From this point of view, a program for attracting local companies could be included in the project which will be implemented by the new organization to promote foreign investors for location in the Region.

The coordination and relations of the two programs is indicated in the following diagram.



As these two programs are interrelated, the efficient implementation with close communication and coordination is important so as to avoid duplication of activities.

The targets of the project to attract foreign investment are to be Japan, Taiwan, South Korea, Singapore, and Hong Kong. Further, the characteristics of foreign investment to the Region will be "resource oriented, secondary processing industry" as described in Development Concept 2010 in Chapter 3, Part 1, Vol. 3 (Sectoral Report).

3.3.2 Location

National and Interprovincial

3.3.3 Executing Agency

BKPM for promotion of foreign investment

The integrated organization newly formed by BKPMs of four provinces for promotion of both foreign and domestic investment.

3.3.4 Expected Benefits

Contributions not only in the development of resource oriented processing industries in the Region and in labour absorption, but also in demand enlargement of agricultural, forestry, fishery and mineral resources.

The development includes:

- 1) increase in production amount,
- 2) more value added,
- 3) diversification of products, and
- 4) level up of manufacturing or processing technology.

3.3.5 Outline of the Project

(1) Program for Promotion of Foreign Investment

The action program for the foreign investors which are chosen as the object of the program will make up the following activities and functions.

1) Advertising Activities

The objectives of public relation activities consist of the following two. First, to make an appeal for the investment merits and superiority of the Indonesian environment through the mass media and its own independent network, and secondly, to create and encourage interest among investors considering investment to Indonesia.

At present, such PR activities to excite and develop interest among investors are of prime importance.

Followings are the sub-programs of the activities:

a) Program for Employing Mass Media

This will involve publicity regarding the advantages of the Indonesian investment environment via newspapers, magazines and broadcasting media both at home and overseas. The main activities will be press meetings and advertising.

Press meetings will take place either in Jakarta or in major cities overseas. Conducted by high government officials, they will provide comprehensive coverage including the release of information showing the advantageous conditions of Indonesia, government policies and preferential measures, and data comparing Indonesia to competitor countries. Also, such press meetings should be timed to coincide with the visits abroad of high-level officials, or the holding of seminars. In principle, they should be held either in Indonesia or in the hosting country once every month.

Advertising is to be done via the media directly by BKPM. The central aim will be to increase the interest among investors in Indonesia. Articles will focus on the positive attractiveness of Indonesia, the cheap labor cost and its geographical advantages. Moreover, a coupon system can be used for requests for investment data and printed information for Indonesia.

The main media employed will be newspapers but besides general circulation editions special industrial newspapers can be used. This will help increase the effectiveness of publicity appeals to the industries targeted and to small and medium industries.

Invitation tours for journalists will concentrate on Indonesia tours for newspaper and magazine journalists. The main aim will be to promote an accurate portrayal of the national situation and to encourage articles presenting a positive attractive image. BKPM should seek the support of the Ministry of Tourism, Post and Telecommunication, Garuda Indonesia Airlines, Hotel Associations, KADIN, etc. It is important to show a national stance which welcomes foreign investment. Invitations should be extended to one journalist of each of the major daily papers and to economic newspapers, with each tour group consisting of between 10 and 15

members. With regard to Japan, it is expected that the total number to be invited would be about 30 members to include magazine journalists.

b) Preparation of Pamphlets

In addition to the pamphlets now being distributed by BKPM, the following four types of new pamphlet should be produced.

i) Guidelines for Potential Investors

Since this is directed at the wide range of potential investors, it should employ a large number of charts, tables and diagrams presenting the advantages of the investment environment in Indonesia, and be easy and quick to assimilate.

The main contents are to include:

- Key economic indicators
- Investment policies (Laws, Acts)
- Resources
- Advantages of Indonesia
- Price and cost information
- Promotion privileges
- Security and safety measures

ii) Profiles of Specific Industries

This pamphlet is to summarize the world trends in a given industrial sector and introduce measures for the promotion of investment in major sectors of Indonesian industry. This pamphlet will supplement the general profile issued to date and also further the attraction of industries which are favored.

Main contents include:

- Export, import and production
- Resource for sub sectors
- Incentives for sub sectors
- Advantages in the sub sectors

iii) Questions and Answers

After collating the various inquiries and questions received to date by BKPM and BKPMs, 30 to 40 main issues are to be selected and these are to be explained to provide a useful guide for investors which can be used during follow up procedures with promising investors.

All three of the above pamphlets should be written (translated) in various languages of the investor countries, and should be of the same cover design and format. A colorful and active presentation of Indonesia should be sought.

2) Follow up and Marketing Activities

The followup to identified investors is to be undertaken on the basis of the policies of BKPM and the degree of interest of investors, in order to select target

investors to be persuaded by means of followup contact. Once such target investors are selected then a system for followup measures can be set up.

Followings are the sub-programs of the activities:

a) Seminars

Seminars have been held to date jointly between BKPM and external bodies. These have been in the major cities and in many cases the participants have not been restricted to industrialist nor in terms of the industrial size of participants. As the above format is considered appropriate and effective for gathering potential investors from an unspecified number of participants, these should be continued.

In addition to these, seminars should be held which specify the industrial sector or organizational nature of the industries chosen, including small-scale seminars for local industries. Taking the example of Taiwan and Japan as reference, there are certain particularities of foreign investment flow. In the case of Japan, the subcontractors of large manufacturers tend to enter overseas markets in groups. Further, small-scale companies of the same industrial sector in Taiwan enter overseas markets as groups also. It is therefore an extremely effective approach to determine the targeted area in the case of seminars for these countries. For example, the industries related to automobile parts manufacturing in and near Toyota city, casting industries of Kawaguchi city, or engine re-builder of Toyama are appropriate targets for seminars.

b) Group Meetings and Programs for Introducing Joint Partners

The identification and selection of joint venture partners is a vital issue for investors. In this sub-program the investors whose profile has been clarified in the seminars will be further screened and investor groups classified. More specialized investment guidance will be provided to the industrial groups thus defined and small seminars focusing on central themes will be held.

Further, foreign companies searching for joint venture partners in Indonesia will be listed with the aid of the Chamber of Commerce and Industry (KADIN) and the lists will be divided into groups according to objectives and requirements. The BKPM network will provide for an exchange of information between the parties, and for introductions. Also through opportunities such as investment missions, a program for introducing joint venture partners will be set up.

Seminars and group meetings should take place once a month, and should be held so as to attain a regional balance. Investment missions should enroll participants from throughout the nation and should be undertaken in accordance with Indonesian conditions.

3) Information Services

In conjunction with the activities of 2) above, the provision of information tailored to the differing needs of investors is needed. This basic function will be carried out by an information center which will activate the network with external agencies. Various ways of information transmission include the use of the mass media, seminars held by BKPM and the use of a network tied in with external bodies such as trading companies and banks.

Following are the sub-programs of the activities:

a) Setting up of Foreign Advisor Groups

It is proposed to set up advisory groups for BKPM, consisting of members from foreign enterprises and foreign Chamber of Commerce and Industry located in Indonesia. These groups are to hold monthly discussions on subjects such as BKPM systems, preferential treatment measures, and promotion activities. These meetings will serve as a venue for the exchange of views, and contribute to the on going activities of BKPM.

b) Establishment of an Information Center

An information center will have two main supports. On the one hand it will give a list of foreign potential investors interested in becoming joint venture partners in Indonesia and the list of parts suppliers. For examples, for Japanese potential investors, data bases should be built up by ASEAN Center-ASEAN Promotion Center on Trade, Investment and Tourism - in Tokyo concerning Japanese companies and in Jakarta for Indonesian companies, and it would be most desirable to have the two bases linked. If this is difficult in practice, then at least each party should possess a data bank of data and answer questions by fax. The second task is the establishment of a data base for the information package for the potential investors.

c) Creation of Sales Tools such as Phamplets, etc.

For details see section (1)-1)-b).

4) Consulting Activities

For the potential investors who have been identified through the PR and marketing activities, consultation, guidance, persuasion and support are to be continously undertaken in line with individual needs until the investment decision is finally made by the investor. It is necessary to define main groups to be promoted and taking into consideration the characteristics and specialities as well as expertise required for consultation to match the locality, industrial sectors and structures of the potential investors in order to render consultation efficiently and effectively.

Following are the sub-programs of the activities:

a) Comprehensive Consulting Services

This involves the dispatch of replies and documentation in response to the inquiries and demand for data received during the publicity and seminar activities. At the time of response, a questionnaire should be enclosed in order to establish details of the investor concerned. Also, response or contact by telephone and visits to companies might take place in connection with specific investment consultation. The data thus assembled is to be recorded in the information center and used later as back-up data. Further, it is advisable that consultants who have good knowledge and experience related to the local business be designated as investment advisers, because of need for special knowledge such as communications and the business environment.

b) Circulating Consultant Services

In cooperation with the regional Chamber of Commerce and Industry (KADIN) and local banks, a team consisting of BKPM staff and local consultants should carry out circulating consulting services to local investors. After setting dates and venues in concern with local cooperative bodies these will be dispatched to serve the local investors once whatever preparation deemed necessary are completed. In principle, such consulting services should be planned to start the day after the seminars in regional locations.

c) Follow up Consulting Services

Among the potential investors who have been identified by the publicity program, direct mail and seminars, etc. a first screening is carried out to draw up a followup list. Regular checks should be made as to the status of the investors of this list, and if necessary, contact made by telephone or letter to promote investment of Indonesia. Also, information should be regularly dispatched and a check made on their response. These activities form an integrated part of the followup activities and will be implemented in the latter half of the action program.

5) Monitoring Activities

A monitoring center needs to be set up in BKPM and the main overseas action bases to scrutinize investor trends, as well as check on the progress achieved in the action programs. At the same time, it will function as an information network. Therefore, this center will be located the center of the overall action program as well as the center of the information network and dissemination system.

In connection with the establishment of the information center referred to 3)-b) above, a general information center is to be set up to coordinate the progress of action programs undertaken by the overseas action bases (the embassy of Indonesia in the case of Japan). The major tasks of this center will be the work of the progress monitoring desk, including management of data concerning investors, and investment related data, and keeping a check on programs in progress.

The responsible personnel for monitoring services will make regular reports back to the Jakarta BKPM Head Office of the progress of each sub programs. On the basis of this data, detailed adjustments of plans and confirmation of major items can be carried out, and a feedback or information created. The center will also monitor investor information which can be used in the consultation activities.

(2) Domestic Investment Promotion Activities

It is observed that to date these have mostly been of a passive nature and little active promotion has been undertaken. It is necessary in the future firstly to increase the quantity of information to be provided to potential investors. Further, there must be more measures taken to set up channels for the dissemination of information. The following represents a proposal for concrete programs in this direction.

1) The Issuing of Investment Guidebooks

At present, the guidebooks issued by the BKPM of each province for the investors are a compact digest of a wide range of information. Issuing of more detail-explained guide book for potential investors are anticipated. This activity needs to be continued and extended.

2) Identification of the Investors to be Attracted to the Region

Main core will consist of investors who undertaken production of resource oriented primarily processing goods, but the core will also involve such linkage-type manufacturers as those to provide the intermediate goods and packaging materials to the factories operating in the Region.

3) Collaboration with various manufacturers association

Through collaboration with the various manufacturers' associations under KADIN, efforts have to be made for attracting their member firms to the Region. Also, provision of such basic information which is useful for private investors such as resource reservation, infrastructure conditions, regional incentives, etc. in the seminars sponsored by domestic investment promotion agencies, trading corporations, banks, etc. is to be carried out.

4) Reinforcement of Consulting Services

The feasibility study are to be prepared by the investors though collaboration with a third party. By strengthening the in-house consulting functions of the BKPMs themselves on the basis of their experience to date the time and cost for investors could be lightened.

5) Implementation of Joint Investment Campaign between the Provincial Governments and the Private Sector

The stimulation of investment within the province should be made a policy of four provinces. This is already the case in Cebu in the Philippines where overseas investment and tourist promotion is carried out via the provincial government and a budget is allocated to that end. Also, active provision of information to the overseas media is pursued and creation of a favorable environment promoted as far as possible in Cebu. BKPMs undertake publicity activities for the province while encouraging the participation of the private sector at the same time.

3.3.6 Phasing

An analysis of similar cases in other countries shows that there is a three-to-four year cycle involved in investment of foreign capital. In view of recent investment trends, there are sufficient indications to conclude that if the attraction measures are actively implemented, a foreign investment boom in Indonesia (in particular from Japan and the NIEs) would result. It is desirable that concentrated activities for promoting foreign investment be carried out over a two year period so as not to lose this opportunity. For this reason, the implementation period for the project proposed here is assumed to be for two years.

3.3.7 Cost Estimation

The direct costs required for implementing the investment promotion program in six countries of Japan, South Korea, Taiwan, Hong Kong, Singapore, and Indonesia herself is estimated as US\$ 3 million. The indicated sum is a provisional estimate. A detailed estimation will be needed when the concrete aspects of target countries and the sub-programs are defined for implementation.

Direct costs made up by following main items; advertising cost, preparation and printing cost of pamphlet, direct mail and communication cost, invitation cost for media people, outgoing and incoming mission subsidies, transportation and trip expenses, and seminar holding expenses.

3.3.8 Major Preconditions and Recommendations

BKPM and BKPMs are now implementing their own investment promotion activities.

4. MINING/ENERGY

4.1 BRIQUETTES PROMOTION PROJECT

4.1.1 Objectives

- 1) To supply briquettes as an alternative energy for wood fuels and oil products,
- 2) To mitigate deforestation caused by the use of traditional wood fuels,
- 3) To intensify the development of new energy source available for rural consumer and industries, and
- 4) To export various kind of briquettes to Asia-Pacific countries.

4.1.2 Location

Pulau Baai (Bengkulu), Bengkulu province

4.1.3 Executing Agency

Pusat Pengembangan Teknologi Mineral (PPTM), Ministry of Mines and Energy.

4.1.4 Justification

(1) Environmental Conservation

Today, environmental destruction caused by artificial deforestation and forest denudation is a serious problem around the world, and Indonesia is not an exception, particularly in those overpopulated areas. In developing countries, the consumption of non-commercial energy that includes wood fuel is still high (See Figure 4.1.1).

The consumption of non-commercial fuels occupied 43.3% of the total energy consumption in 1989. Most of the non-commercial energy was used as fuel for factories of small-scale industries and for houses in rural area, and the annual wood fuel consumed by these two factors is estimated to be around 50 million m³ in Java in 1985.

The forest holding ratio in Java has gone down to about 20% quite recently and is expected to drop even more drastically. Forest denudation causes harmful influences not only upon flood control, environmental climate and ecosystem but also upon global warming-up and greenhouse effect, that are the focused topics of today.

(2) Development of A Substitute for Oil Energy

This project supports the objectives of an energy policy of Indonesia. It is to save an adequate supply of oil and gas for export so that these energies can remain as important sources of foreign exchange for funding the national development programs, and also to support the diversification of domestic energy use.

Table 4.1.1 shows the past trends of primary energy supply and total energy consumption including non-commercial energy and oil export. Although the share of non-commercial energy per total energy consumption has decreased, the amount of non-commercial energy is still steadily increasing. Considering the balance of total energy consumption and oil export, the surplus of oil export is shrinking.

If the fuel conversion from vegetal fuels to Kerosene is accelerated with economical growth, the domestic energy demand will press on the export of oil. According to Team estimate, GDP per capita will grow from 0.64 to 0.93 million Rp. (1983 constant prices) during 1990-2000 (See Interim Report LTA-129). About 15% of the share of non-

commercial energy per total energy consumption will shift from non-commercial to commercial energy under the simple hypothesis that the general relationship as shown in Figure 4.1.1 can be applied.

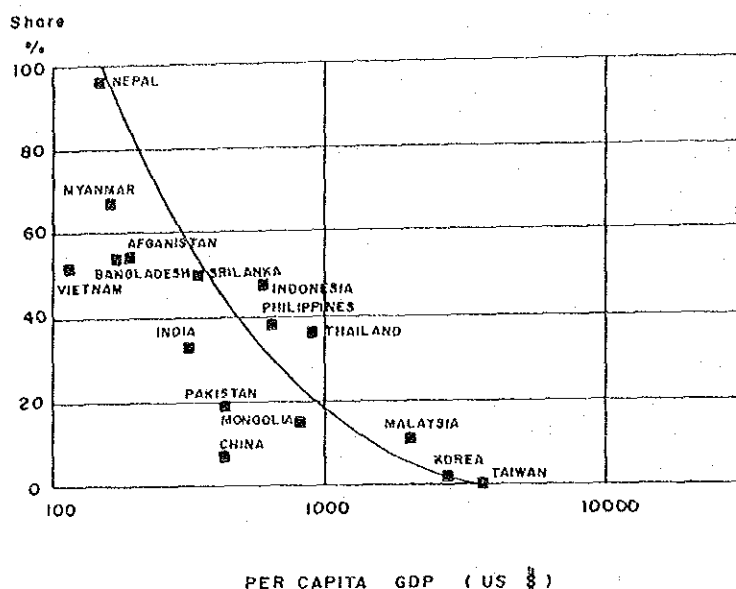


FIGURE 4.1.1 SHARE OF VEGETAL FUELS / PRIMARY ENERGY CONSUMPTION

Table 4.1.1 Past Trends of Commercial and Non-commercial Energy Consumption

Description	(Unit: Million TOE)				
	1971	1975	1980	1985	1989
Primary Energy Supply (commercial energy)	8.72	13.59	25.17	31.31	41.72
Production of Vegetal Fuel (non-commercial energy)	21.87	23.86	26.56	29.54	31.90
Total Energy Consumption	30.59	34.75	51.73	60.85	73.62
Ratio of Non-commercial Energy (%)	71.5	63.7	51.3	48.5	43.3
Oil Production *	44.9	65.8	80.0	66.9	74.2
Oil Export *	33.1	54.4	60.9	42.7	40.4

Note: *; uses crude oil conversion factor TOE/metric ton of 1.02
 Source: IEA, Energy Statistics and Balance of Non-OECD Countries, 1988-1989

(3) Keeping of National Income and Improvement of Life-Style

In 1990, export income from exporting oil and gas was US\$ 11,848 billion. This accounts for 44.8% of the total export of Indonesia. Briquettes promotion can contribute to keep the exports income at least.

This project can also offer economical and technical merits. Establishment of briquettes manufacturing industry will enable Indonesia to transfer the manufacturing technology to other developing countries. Export of briquettes can create employment opportunities and business opportunities.

(4) Stage of Briquettes Promotion

PPTM (Mineral Technology Development Center, Ministry of Mines and Energy) has carried out laboratory tests and manufacturing in cooperation with PT. Batubara Bukit Asam. A few kind of briquettes samples are manufactured, egg shaped and cylinder shaped briquettes, and also semi-coke briquettes are producing by way of experience.

To familiarize briquettes, PPTM published the pamphlet for Public Relations, "Briket Batubara untuk Energi Rumah Tangga, Batubara No.1 Th.1.92". A small pilot plant is being planned by PPTM (Bekasi, West Java).

4.1.5 Outline of Project

(1) Fuel Price

Table 4.1.2 shows current consumer price of various fuels and energy. The price of briquettes is fully competitive with charcoal. Regarding Kerosene price, based on energy price policy of Indonesia, the price of US\$ 0.123/l is too cheap in comparison with the international market price (See Table 4.1.3).

Table 4.1.2 End Consumer prices of Fuels and Electricity

Products			Rp/MMBTU	Remarks
Charcoal	Rp/kg	300	10,486	13,000 BTU/lb
Kerosene	Rp/l	250	7,232	19,000 BTU/lb
Wood Fuel	Rp/kg	40	3,024	6000 BTU/lb
Briquettes	Rp/kg	250	10,500	6000 Kcal/Kg
Electricity	Rp/kwh	125	36,625	for small household

Source: PPTM and PLN

Table 4.1.3 Fuel Oil Prices Comparison

Products	(Unit: Rp/litter)					
	Indonesia	Malaysia	Singapore	Thailand	Philippines	South Korea
Gasoline	450	752	1,234	773	1,291	1,000
Kerosene	190	504	643	651	512	498
Automotive diesel	245	462	627	627	512	480
Industrial diesel	235	305	545	612	n/a	488
Fuel Oil	220	213	499	317	341	354
Average	268	482	724	614	637	567

Note: Average values are weighted by Indonesia product mix, 1990/91. Excludes aviation gas and turbo

Source: The 1991 Petroleum Report -Indonesia-, Embassy of United States of America, July 1991, Jakarta.

Table 4.1.4 shows the past trends of domestic fuel oil prices. The prices have rapidly risen, and the mean annual rising rate of Kerosene shows 17,6% during the period of 1980-1990. Taking into consideration of the past trend, the price of Kerosene can be estimated to be higher than the price of briquettes per million BTU in the next few years.

Table 4.1.4 Past Trends of Domestic Fuel Prices

(Unit: Rp/liter)

Products	May 1979	May 1980	Jan 1982	Jan 1983	Jan 1984	Apr 1985	Jul 1986	May 1990	Rate (%) (1980-1990)
Avgas	100	150	240	300	300	330	250	330	8.2
Avtur	100	150	240	300	300	330	250	330	8.2
Super Gasoline	140	220	360	400	400	440	440	570	10.0
Premium Gasoline	100	150	240	320	350	385	385	450	11.6
Kerosene	18	37.5	60	100	150	165	165	190	17.6
Automotive Diesel Oil	35	52.2	85	145	220	242	200	245	16.7
Industrial Diesel Oil	30	45	75	125	200	220	200	235	18.0
Fuel Oil	30	45	75	125	200	220	200	220	17.2

Source : The 1991 Petroleum Report -Indonesia-, Embassy of United States of America, July 1991, Jakarta.

(2) Supply Potential of Raw Materials

In Bengkulu province, several coal mining concessions are newly applicable for development in addition to the area operated by the four mining companies. At present, coal resources with heat value of around 6,500 Kcal/Kg is mined for export, and more mines are planned to open in the next few years. Further development is due to domestic demand for coal with the heat value of around 5,000 Kcal/Kg. Coal quality is as follows:

1) Lingapur Coal (PT. Danau Mas Hitan) - one of mines operated

	As Received	Air Dry	Dry Basis
Total Moisture	% 1.72	-	-
Air Dried Moisture	% -	0.89	-
Ash Content	% 11.33	11.43	11.53
Volatile Matter	% 37.66	37.98	38.32
Fixed Carbon	% 49.29	49.70	50.15
Total Sulfur	% 3.83	3.87	3.90
Calorific Value	Kcal/Kg 7,148	7,208	7,273
H.G.I	54	-	-

2) Non - Development Fields - 22 points

	As Received	Air Dry Basis
Total Moisture	% 4.47	-
Free Moisture	% 1.27	-
Inherent Moisture	% -	1.27
Ash Content	% -	2-60
Volatile	% -	15-37
Fixed Carbon	% -	13-46
Total Sulfur	% -	0.2-3.5
Calorific Value	Kcal/Kg -	2000-5500

(Source: PPTM Coal Laboratory)

Table 4.1.5 Coal Production and Export

Enterprise	(Unit: '000 ton)						
	1985	1986	1987	1988	1989	1990	1991
PT. Bukit Sunur	23 (15)	132 (86)	117 (97)	160 (32)	433 (71)	379 (122)	293 (245)
PT. Danau Mas Hitam			167 (86)	308 (143)	313 (87)	365 (60)	153 (117)
PT. Cipta Sumber Alam					83 (68)	74 (21)	4
PT. Ngalom Reksa Utama						19 (10)	43 (37)
Total	23 (15)	132 (86)	284 (183)	468 (175)	829 (226)	837 (213)	492 (399)

Note: () shows export volume

Source: Bengkulu Office of Ministry of Mines and Energy

The performance of coal production in Bengkulu province is shown in Table 4.1.5. Limestone at Murga Seluma and Lb.Tandai was surveyed recently, and it was proved to be as good quality as to develop cement industry and other industries. Limestone resources by Kabupaten are estimated as follows.

Kab. Bengkulu Utara	Kerkap I	2.73 million tons	CaO 40 %
	Kerkap II	6,900 tons	CaO 40-52%
	Kerkap III	15,000 tons	CaO 28-40%
Kab. Rejang Lebong	Muara Aman	n.a	n.a
Kab. Bengkulu Selatan	Bengkunang	12.3 million tons	CaO 41-53%

Biomass industries, needless to describe, the area close to Pulau Baai Port has various biomass material.

(3) Demand Potential

1) Industrial Sector

- a) Fuels for drying: Cement factories, brick manufacturing factories, limestone sintering factories, plywood manufacturing factories, metal refinery, pottery and asphalt plants etc.
- b) Fuels for steam generation: Paper/pulp manufacturing factories, small-scale power plants, cleaning and food processing factories etc.

2) Commercial and Residential Sector: Fuel for cooking in household and small shops.

4.1.6 Phasing

(1) Feasibility Study

1) Fact-finding and Marketing Research

- a) A fact-finding on forest denudation and its influence upon flood control environmental climate and ecosystem.
 - i) INTELSAT photograph analysis

- ii) A field survey on selected areas
 - iii) Review of existing data and/or information concerned
- b) A fact-survey on fuel consumption by small-scale industries at selected factories in selected areas
- i) Classified by industries-brick and tile, limestone sintering, earthenware, tobacco, tea leaves, food and beverage industries, metal refinery, blacksmith and foundry and etc.
 - ii) Classified by fuel-wood fuel, charcoal, coal and coke oil natural gas, agricultural waste etc.
- c) Demand forecast of briquettes for export
- i) Estimation of briquettes demand in Asian countries, particularly in South Korea, Taiwan and ASEAN countries
 - ii) Confirmation of briquettes products to meet demand for various industries such as steel industry and paper/pulp industries and for commercial and residential use.

2) Technical and Economical Evaluation

- a) Investigation of substituting fuel for wood fuel and charcoal (including comparative combustion tests on sample of promising substituting non-wood fuel)
- b) Technical evaluation of briquettes manufacturing
- c) Technical evaluation of combustion efficiency and methods
- d) Investigation of cottage industries (related to agriculture, forest, fishery and others) which have a possibility of increasing personal income in rural area (to buy substituting fuel)
- e) Conceptual economical evaluation on conversion wood fuel and charcoal to non-wood
- f) Conceptual evaluation of the comparative merit and demerit among promising non-wood fuel substitutions for wood fuel
- g) Recommendation on the conversion of wood to non-wood fuel for use in small-scale industries and household use from the economical point of view

3) Demonstration Test

- a) Briquettes manufacturing by a pilot plant
- b) Detailed design of a commercial plant
- c) Making a cost estimation and an implementation schedule
- d) Bidding preparation (procurement method and contract packaging, documentation for bidding, contract and etc.)

(2) Construction of Commercial Plant

- 1) Linkage to coal yard of Pulau Baai near Bengkulu
- 2) Construction of Commercial Plant
 - a) Construction contract
 - b) Preparation
 - c) Construction

(3) Schedule

The following schedule can be proposed. The required implementation period is 24 months.

Figure 4.1.2 Implementation Schedule

Description	6	12	18	24
Feasibility Study				
Fact-finding & Marketing Research	_____			
Technical & Economical Evaluation		_____		
Demonstration Test		_____		
Construction Commercial Plant				
Construction Contract			_____	
Preparation			_____	
Construction				_____

4.1.7 Cost Estimation

- | | |
|---|-----------------|
| 1) Feasibility Study (including a pilot plant) | US\$ 1,200,000 |
| 2) Construction of Commercial plant (including a commercial plant of the capacity 50 thousand/year) | US\$ 11,000,000 |

4.1.8 Appraisal and Recommendations

- 1) This project supports the government's energy policy for diversification of energy.
- 2) Good quality briquettes with high calorie can be exported to Asian countries, such as Malaysia, Thailand, Singapore, Hong Kong and Korea.
- 3) Smokeless briquettes have a possibility to become a substitute for kerosene.
- 4) De-sulfurization function can contribute to environmental problem and life environment.
- 5) This project would bring about various social benefits that include creation of business and employment opportunities and technological transfer.

Appendix A4.1 Demand Forecast and Consumption of Anthracite

Table A4.1.1 Demand Forecast of Anthracite in Japan

Item	FY 1989	Scenario H		Scenario L	
		2000	2010	2000	2010
		(Unit: 1,000 tons)			
Iron and Steel	708	2,160	3,200	1,500	1,800
Sintering	708	1,700	1,900	1,500	1,400
Mew Smelting Process	-	360	-	-	-
Smelting Reduction Process	-	-	1,300	-	400
Cement	714	700	700	500	500
Chemical	133	150	200	100	150
Briquetting	143	150	150	100	100
Others	134	150	150	100	100
Total	1,832	3,210	4,400	2,300	2,650

Table A4.1.2 Demand Forecast of Anthracite for Sintering

Item	1995	2000	2010
Production of Pig Iron (million tons)	78 - 80	68 - 75	48 - 64
PCI (kg/ton)	120	150	2000
Total PCI (1,000 tons)	9,360 - 9,600	10,200 - 11,250	9,600 - 12,800
Ratio of breeze in coke (%)	15	15	15
Requirements of anthracite (1,000 tons)	1,404 - 1,440	1,530 - 1,688	1,440 - 1,920

Table A4.1.3 Demand Forecast of Anthracite in Korea

Item	1985	1986	1989	1995	2000	2010
Residential & Commercial	23,567	24,712	20,749	13,044	9,732	3,646
Electricity	1,778	2,285	2,438	2,827	2,732	2,000
Others	491	591	483	104	51	12
Demand Total	25,836	27,588	23,670	15,975	12,515	5,658
Production	22,543	24,253	20,785	12,320	11,540	N.A.
Import	2,830	4,575	1,710	500	0	N.A.
Supply Total	25,373	28,828	22,495	12,820	11,540	N.A.

Source: Korea Energy Economics Institute

Table A4.1.4 Consumption of Anthracite in Japan

Year (F.Y.)	(Unit: 1,000 tons)							
	Chemical	Gas & Coke	House Briquette	Cement	Steel Mills	Ferro Alloy	Others	Total
1980	117	47	373	221	124	131	49	1,062
1981	76	5	258	161	56	83	61	700
1982	38	33	204	252	0	105	29	661
1983	130	70	191	484	0	71	36	982
1984	46	51	262	731	31	67	10	1,198
1985	181	148	231	999	31	65	86	1,741
1986	262	58	194	868	191	50	100	1,723
1987	133	26	197	836	284	54	73	1,603
1988	92	17	143	655	582	63	61	1,613
1989	133	1	143	714	708	67	67	1,833

Source: Ministry of International Trade and Industry

4.2 GEOTHERMAL POWER DEVELOPMENT AROUND ULUBELU

4.2.1 Objectives

- 1) to increase and expand exploration of geothermal energy resources
- 2) to match power demand with the most appropriate energy resources available in rural areas
- 3) to promote rural electrification for isolated areas

The objective of the project is to provide low-cost (or relatively cheap) geothermal electricity up to 5 MW to the people living in the surrounding villages of Ulubelu, situated in Lampung Province.

It is also to improve capability and the capacity of personnel of Volcanological Survey of Indonesia and other agencies in the Ministry of Mines and Energy, in supporting the government program on assessment of electric energy resources in Indonesia. Specifically the implementation of this project is within the framework of governments electrical energy resource diversification program as well as rural/village electrification projects, in isolated areas.

To reach the objective, following stages of project activities are involved, i.e. : based on the evaluation of the pre-existing exploration data, determination of "the most suitable" drilling site, the pilot borings of a few geothermal wells with total depths of about 3000 m, the well characteristics and steam production test for up to 5 MW power plant.

As electricity becomes one of the most important basic needs in a modern society, the villages electrification will result in the rapid increase of the standard of living-condition of the people in Lampung Province. The success of this project will promote further many other electricity development projects to be implemented in various isolated geothermal fields in Indonesia.

4.2.2 Location

Ulubelu, Lampung Province

4.2.3 Executing Agency

- 1) Volcanological Survey of Indonesia, Directorate General of Geology and Mineral Resources, Ministry of Mines and Energy.
- 2) Directorate of Electricity Development, Directorate General of Electricity and New Energy, Ministry of Mines and Energy.

4.2.4 Justification

The geological configuration of Indonesia archipelago is among others characterized by numerous quaternary to recent volcanoes distributed along a belt starting from the northern part of Sumatra, Java, Bali, Lombok, Sumbawa, Flores, Solor, Lombok, Alor and Wetar. To the east this belt bends north-eastward through the islands of Saparua, Haruku, Ambon, Bacan, Halmahera and links with the volcanic belt in the Phillipines. The result of geothermal investigation along this belt so far shows that many geothermal resources are located in isolated areas near remote villages, and situated in mountainous or volcanic in region with elevation an at approximately 700 m or more, above sea level.

Some of the geothermal fields are proven to produce high temperature and pressure steam from a relatively shallow reservoir of 600 - 1000 m depth, suitable for electrical generation of small power plant of up to 5 MW. The fact that many villages in isolated areas of southern part of Sumatra, mainly the Lampung Province, near the geothermal fields need electricity.

The activity of the project will involve evaluation of the existing geological-, geophysical- as well as volcanological- and other data relating to Ulubelu geothermal area. As data prove to be feasible for further steam drilling, step will be taken to clear the area for drilling, to prepare the infrastructure needed such as base camp, access road and the necessary bridges.

This will then be followed by drilling of 1 or 2 geothermal steam wells with total depth of 3,000 m, and with 6" dia of production casing pipe, well characteristics, steam-production test. The final stages of the project will involve Engineering- Feasibility Study for the installation and operation of up to 5 MW electric power plant in the geothermal field, its construction and distribution of its electricity to the surrounding villages.

4.2.5 Outline of the Project

(1) Current Situation of Rural Electrification

The past trends of rural electrification in the Region IV is shown in Table 4.2.1. Rural electrification has steadily progressed since 1984/85. Table 4.2.2 shows the current situation of rural electrification of Lampung province in comparison with other provinces in the Southern part of Sumatra. The population and population density of Lampung are the highest in the Region. However, the situation of village electrification and household electrification is the lowest or lower compared with South Sumatra and Bengkulu provinces.

Table 4.2.3 and Table 4.2.4 show the current situation of rural power generation in the Region and the current situation of rural power generation in Lampung province, respectively. Power generation of rural areas in Lampung is higher than those of other provinces. The ratio of rural and total power generation of Lampung is also the highest in the Region. It is considered that rural power plays an important role in Lampung and the power demand in rural areas is high.

Electric power demand in Lampung has rapidly increased, and still now is continuing to keep high growth rate. Power development is one of the most urgent problems that Provincial government faces. At present, the power system interconnection in the Southern part of Sumatra is now under construction. Through the completion of Tanjung Enim - Tarahan transmission line, Lampung province can be supplied with electricity from South Sumatra and Bengkulu in the future.

Regarding isolated areas, however, it is difficult to supply electricity from main transmission line. Figure 4.2.1 shows the current situation of power distribution and areas having geothermal potential in Lampung province. Ulubelu area is isolated from power distribution network. Rural electrification can stimulate economic activities and enhance the intellect of the people in the rural areas. Geothermal power development around Ulubelu is the first step to use available energy resource in Lampung province. The success of this mini power plant can promote large scale power plant project in next stage.

Table 4.2.1 Past Trends of Rural Electrification in the Region IV

Item	1984/85	85/86	86/87	87/88	88/89	89/90	90/91
Villages							
No. of villages	5,749	5,749	5,774	5,781	5,781	5,864	5,864
Elect. villages	453	497	763	999	1,113	1,193	1,301
Elect. rate (%)	7.88	8.64	13.21	17.28	19.25	20.34	22.19
Households							
Elect. rate (%)	1.76	2.68	5.04	7.43	9.09	9.73	10.86

Source: Data dan Statistik 1990/1991, PLN Wilayah IV April 1991

Table 4.2.2 Current Situation of Rural Electrification

Province/ Kabupaten	No. of desas	Elec. desas	Elec. rate (%)	House Elec. (%)	Urban ratio (%)	Pop. den. (Pop./km ²)	Pop. (1000)	Land area (km ²)	GDP/ capita (Rp.mil.)
Jambi	751	138	18.4	7.5	7.2	29	1,398	49,030	0.35
S. Sumatra	2,385	548	23.0	11.8	13.2	46	5,023	108,998	0.52
Bengkulu	1,027	365	35.5	22.8	9.3	51	1,009	19,644	0.36
Lampung	1,530	283	18.5	5.1	5.4	167	5,380	32,208	0.28
L. Selatan	562	146	26.0	8.4	5.6	274	1,824	6,649	0.28
L.Tengah	447	63	14.1	3.2	6.7	207	1,901	9,190	0.31
L.Utara	521	74	14.2	3.8	3.7	85	1,655	19,369	0.26
Total/Average	5,693	1,334	23.4	9.3	8.9	61	12,810	209,880	0.39

Source: Draft final report, Vol.3 Sectoral report

Table 4.2.3 The Situation of Rural Power Generation in the Region

Province	No. of Unit	Installed Cap. (kw)	Maximum Cap. (kW)	Peak Load (kW)	Generation (Mwh)	Rural/Total (%)		Per Capita (Kwh)	
						Generation	Installed	Rural	Province
Jambi	25	2,600	2,274	1,777	5,298.9	3.95	5.30	3.16	52.86
S Sumatra	77	10,710	7,888	5,747	15,996.7	1.95	3.14	3.18	99.34
Bengkulu	28	2,640	1,820	1,301	3,259.0	4.40	8.60	3.23	47.24
Lampung	53	8,860	5,704	5,888	20,238.4	7.38	8.52	3.76	33.47
Region	183	24,810	17,686	14,713	44,793.1	3.44	4.72	3.42	62.00

Note : All units are diesel generators.

Source : PLN, Wilayah IV office (Palembang)

Table 4.2.4 The Situation of Rural Power Generation in Lampung (1990/1991)

No.	Name	Type of Generators	No. of Unit	Installed Capacity (kW)	Mavimun Capacity (kW)	Peak load (kW)	Production 1990/1991 (kwh)
1	Kota Agung	D	3	460	360	360	1,367,958
2	Bandar Jaya	D	6	2000	730	770	3,004,880
3	Bukit Kemuning	D	3	1100	840	870	3,189,440
4	Manggala	D	3	460	350	338	923,950
5	Sribawono	D	4	1560	775	960	4,095,060
6	Sidomulyo	D	2	440	300	300	1,004,110
7	Bangun Rejo	D	3	240	205	164	330,356
8	Sumber Jaya	D	2	440	360	358	1,067,820
9	Kali Rejo	D	1	100	80	80	324,135
10	Kenali	D	1	100	80	53	159,750
11	Baradatu	D	2	140	112	117	416,950
12	Liwa	D	2	140	123	126	361,986
13	Krui	D	1	220	187	216	597,977
14	Blambangan Umpu	D	1	100	80	58	209,975
15	Tanjung Bintang	D	1	100	90	100	320,035
16	Way Jepara	D	1	220	150	150	454,636
17	Parda Suka	D	2	200	160	160	476,450
18	Jabung	D	2	140	120	112	283,410
19	Putihdoh	D	1	40	35	36	112,165
20	Pulung Kencana	D	2	200	178	178	443,950
21	Abung Timur	D	2	80	70	52	122,174
22	Seputih banyak	D	2	80	68	76	239,412
23	Seputih Surabaya	D	2	80	80	80	234,184
24	Wonosobo	D	2	140	101	104	255,021
25	Padang Cermin	D	2	80	70	70	242,648
Total		D	53	8,860	5,704	5,888	20,238,432

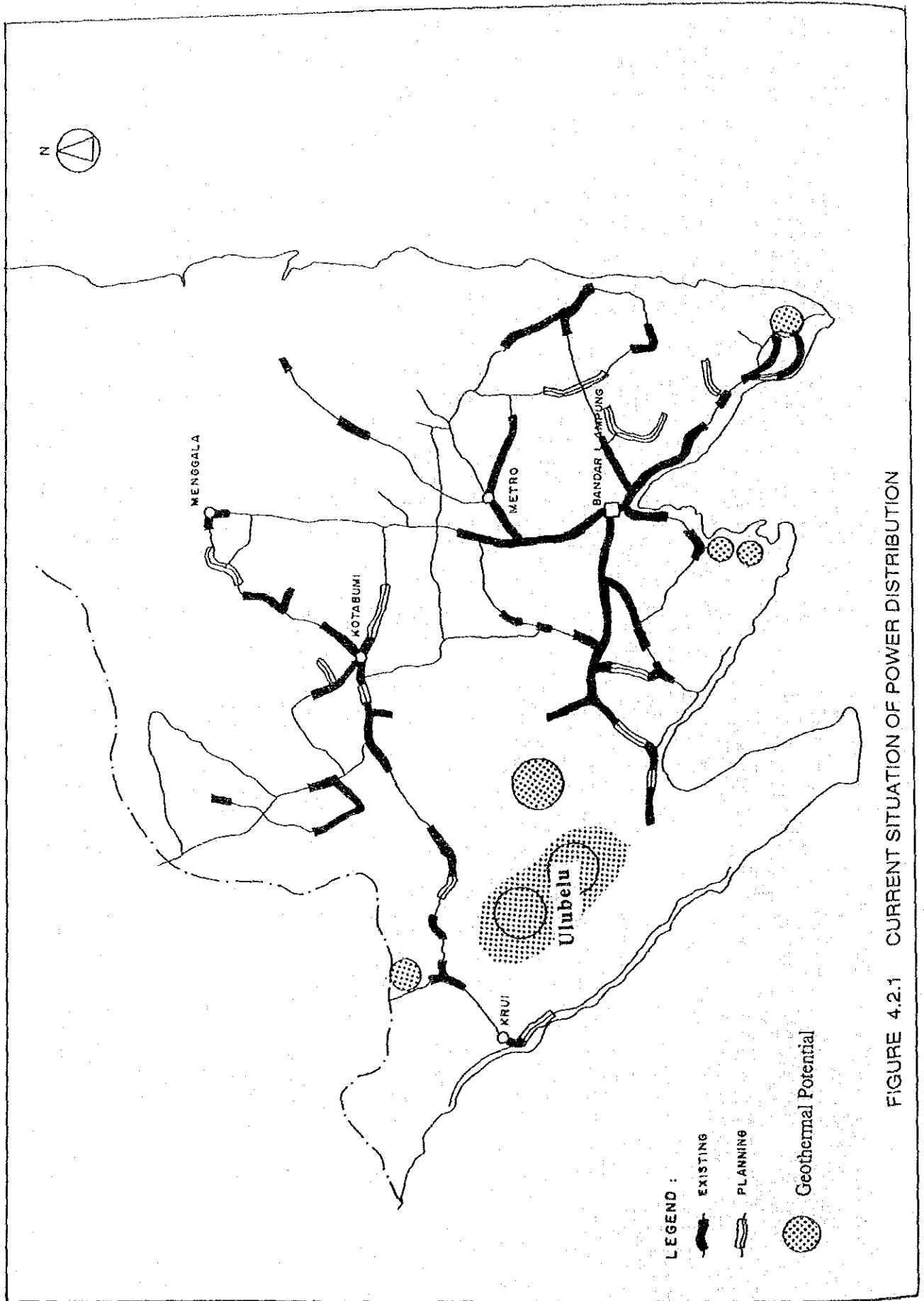


FIGURE 4.2.1 CURRENT SITUATION OF POWER DISTRIBUTION

(2) Geothermal Potential

The results examined by Pertamina were hopeful.

4.2.6 Phasing

(1) Resource Feasibility Study

Geothermal Resource Feasibility Study involves evaluation of pre-existing exploration data, drilling of one or two geothermal wells with total depth of up to 3000 m, borehole-geology, -chemistry, and -geophysics, well characteristics and steam production test.

(2) Engineering Feasibility Study

Engineering Feasibility Study involves rural electricity demand survey in the surrounding villages of the geothermal fields, the installment and operation of up to 5 MW geothermal electric power plant.

(3) Implementation

The Volcanological Survey of Indonesia has carried general geological investigation, and geochemical reconnaissance survey, in Ulubelu, G. Rajabasa, G. Kukusan and Pematang Belirang geothermal areas. Base on the existing data, the following stages should be implemented :

1) Resource Feasibility Study

- | | |
|--|------------|
| a) Detail geological investigation | : 3 months |
| b) Detail geochemical investigation | : 3 months |
| c) Geo-electric survey using CSAMT method | : 3 months |
| d) Test drilling of a few wells with maximum total depth of 3000 m | : 9 months |
| e) Borehole-geology, geochemistry, -geophysics | : 2 months |
| f) Well characteristics and steam production test | : 3 months |

2) Engineering Feasibility Study for up to 5 MW

- | | |
|------------------------------------|------------|
| a) Geothermal Electric Power Plant | : 6 months |
|------------------------------------|------------|

3) Project Duration: 24 months

4.2.7 Cost Estimate

(1) Inputs

1) External Inputs

- Services of experts in several aspects of geothermal-science to carry the project in Indonesia, and to train the Indonesian staff in the field of drilling techniques, borehole-geology, -geochemistry, and -geophysics, geothermal reservoir evaluation and power plant operation and maintenance.
- Training and degree program study in geothermal science for Indonesian scientists and engineers. Training and joint-research requested are in the field of :

- i) Borehole-geology, -geochemistry, and -geophysics
- ii) Rock hydro-thermal alteration in geothermal system
- iii) Geothermal evaluation techniques and methods
- iv) Small geothermal electric power plant operation and maintenance

Duration of training: 4 - 9 months.

c) Equipment consists of :

- i) Jeep 4 WD: 2 units
- ii) Truck 4 WD: 2 units
- iii) Drilling consumables of 2 geothermal wells with total
- iv) Total depth of max. 3000 m , and production casing pipe of 6" in diameter
- v) 1 unit geothermal electric power plant of up to 5 MW capacity.

2) Internal Inputs

The government of Indonesia acting through its executing agency the Volcanological Survey of Indonesia within the framework of Resource Feasibility Study stage of the project, and the Directorate of Electric Power Planning and Development within the framework of Engineering Feasibility Study stage of the project, provides :

- a) Counterpart personnel for participation and training in the project
- b) Field transportation of personnel and equipment, and local labors
- c) Office and laboratory space and facilities, and furnished housing according to Indonesian standard
- d) Official use of cars
- e) Secretarial and cartographic services
- f) Excepting of taxes, duties, levies or license fees according to current Indonesian regulation, which may be imposed on experts in respect of any equipment and any property, which after have been brought to Indonesia may subsequently be withdrawn upon the departure of such experts.
- g) Drilling machines, logging equipment, generator, pumps, etc.

(2) Costs

1) External estimate cost of the project

- | | |
|--|----------------|
| a) Experts services (wellsite geologist, geochemist, geophysicist/reservoir engineer, drilling engineer) | |
| i) 6 man-months scientist | US\$ 40,000 |
| ii) 8 man-months engineer | US\$ 48,000 |
| b) Training for scientist and engineer | |
| i) 20 man-months | US\$ 20,000 |
| c) Drilling consumables for geothermal deep wells (total depth ca. 3000 m) | US\$ 1,000,000 |
| d) Small geothermal power-plant and accessories | US\$ 1,000,000 |
| Sub-total | US\$ 2,108,000 |

2) Estimate cost of additional scientific survey, drilling and well testing

- | | |
|---|-------------|
| a) Geology, geo-hydrology, geochemistry | US\$ 62,500 |
|---|-------------|

b)	Access road, bridges, base-camp, rig and equipment transport	US\$ 600,000
c)	Drilling, borehole-geology, geochemistry, geophysics, well testing	US\$ 450,000
d)	Power plant construction	US\$ 750,000
	Sub-total	US\$ 1,862,500

3) Total cost US \$ 3,970,500

4.2.8 Appraisal and Recommendations

The project will provide low-cost electricity generated by renewable steam, which is produced from one or two geothermal wells.

After the completion of the project, the Directorate Electricity Planning (and VSI) will supervise either the State Electric Power Company (PLN), local or village cooperative, or any company interested in the management of the steam field and power plant, in the framework of future transfer of the project to the company concerned.

As transfer of technical knowledge from foreign experts to the Indonesian counterparts, in the field of geothermal electricity development becomes one of the most important aspects of this project, the expertise which the counterparts obtain will in return be transferred to other Indonesian's concerned with the development of various geothermal fields in Indonesia, in the future.

5. TOURISM

5.1 KRAKATAU TOURISM DEVELOPMENT

5.1.1 What is Krakatau?

Krakatau Islands, Panjang, Rakata, Sertung and Anak Krakatau, are shown on maps just like a fallen teeth from the mouth of Lampung Bay in the middle of the Sunda Strait.

Krakatau which means "crab" in ancient Sanskrit erupted in 1883. This world famous eruption became a theme of American movie titled "East (but why?) of Java", adventure love romance. After two month overture of tremors, it exploded finely on 27 Aug, 1883. The roars of the volcano could be heard in Rangoon, Burma and Perth, Australia and its 'tsunami' shook boats on the Thames river, London. In Bandar Lampung, tsunami reached its height of 30 m and rushed 2 km inland. It blew out about 2/3 of Rakata Island and remained Island of Anak Krakatau as one of the newest island of the world.

The eruption of the volcano became immensely instructive ecologically, a boon for biologists and geophysicists who study islands renascence for clues to the Earth's evolution. It was here that tropical soil science originated. The ecological principle of "Primary Proseccion" unfolded dramatically on Krakatau as the biological slate was wiped and slowly became colonised again.

Marine/Natural Reserve has a circular area with diameter of 10 km, and conserved carefully by Ministry of Forestry and Local Nature Conservation Offices. as a world unique example of geophisics and biology. No inhabitants and no artificial structure are allowed on four islands. Visitors must be register and limited to the number of minimal environmental impact to the reserve

5.1.2 What is Today's Krakatau Turism?

Today, Krakatau day trip can be arranged from both side of Sunda Strait, West Java and Lampung. Base piers are Labuhan, Carita and Pasauran on West Java side, and Carita on Lampung side. Time distance are almost the same from any piers, four hours. Normal full-day itteneraly form Bandar Lampung is shown below;

0600	Departure from B.Lampung by car to Canti
0730	Departure from Canti by boat -on the way possible stop at Sebesi Island
1130	Arrive at Anak Krakatau, start hike
1330	Departure from Anak Krakatau Boat cruise in the Reserve, Lunch
1730	Arrive at Canti
1900	Arrive at B.Lampung

Travel agent arranges this day-trip as a package tour with transportation, guide and resistration, with price of about US\$ 230, depending on numbers of participants.

Nature Conservation office of Lampung reports that 1,713 tourists, domestic:1,136, foreign:577, visited Krakatau in 1991 from Lampung side. Considering Javanese established achievement, it may be estimated about 5,000 tourists visited Krakatau.

Because of strict regulation of development, tourist must bear four hours cruise without any break and just after arrival exhausting and terribly hot climb to the volcano. It is highly requested a station near by to have a break, to enjoy world unique scenary and to climb there in cooling early morning.

In 1991, Lampung provincial government established "Krakatau Lampung Tourism Development Corporation, cooperated with Bali Tourism Development Corporation and two other private hotel companies, to develop Merak Belantung on the east coast of Lampung Bay. This large scaled and ambitious development is aimed not only to develop a new resort but also to establish a new base for Krakatau tourism.

At present, small accommodation facilities can be found only in Kalianda. On Sebesi Island, about the mid-way of Canti-Krakatau route, has two small cottage for tourists and hunters.

Transfortation to Krakatau is limited only to *Kapal Motor*, small motor boat. No speed boat is available.

Table 5.1.1 Visitor Registered to Krakatau Marine Reserve from Lampung in 1991

Foreign	Domestic	Total
577	1,136	1,713

Source : SBKSDA, Lampung

5.1.3 Why Krakatau?

Tourism is not only an industry. It has another meaning as leading flag and symbol to establish local identity like what we can see in northern Sumatra, Lake Toba and Minang Highland. There, tourism awakened local people to have their own identity and to find themselves. Krakatau had long been under the control of Weast Java Province and transfered to Lampung Province in 1988 as a new star of the province. This must be a primary objective of Krakatau tourism and is expected role in Southern Sumatra

Secondary, as an industry, Lampung is a late starter of Krakatau tourism after West Jawa, Carrita Labuan etc. However, Lampung has an advantage of ambitious big tourism development of Merak Belantung, which is aimed as a base of Krakatau tourism. With expected successful development, Lampung can catch up West Java as a copetitor but can not exceed. Here is a reason of further and unique development with taking most advantage of God-given resource, Krakatau.

5.1.4 Project Components

Project proposed consists of components as follows :

- 1) Sebesi Island Stationing Resort development
- 2) Marine transportation improvement

5.1.5 Sebesi Island Stationing Resort Development

Sebesi Island is located about 20 km south-west of Kalianda and about the midway to krakatau. The island has a shape of cone with one peak of 86 m high. Its

beach with white sand is quite suitable for swimming and relaxing. Also there some spots good for snorkeling.

The island has only one village named Tejang on northeastern shore, and is estimated to have population of about 1,000. In Tejang, there is the only accommodation facility on the island with two cottages and its capacity of 12 visitors maximum. This accommodation is aimed mainly for wild-pig hunting and seldom used by Krakatau tourists.

(1) Project Site

Project site shall be located on southwestern shore observing Krakatau Islands above the horizon. The site requires approximately 3.0 ha including private beach and private pier.

(2) Development Policy

1) Harmony with Existing Environment

Untouched Sebesi has very rich landscape. The view of Krakatau and Lampung mainland, blue sea and white sandy beach deep green forest and coconut trees, etc. is excellent. The development must harmonise and co-exist with this existing environment.

2) Minimum Facility with Maximum Service

Krakatau tourism has a purpose to promote eco-tourism. Thus all the facilities are expected to have minimum environment impact. Facilities planned should have minimum superstructure and infrastructure. Instead of luxuriously physical service, it is expected to provide high quality service to answer qualified tourists for enjoying island over-night stay.

3) Local Traditional Building, Low Rise, Low Density

All the facilities in the project site must have authentic Southern Sumatran design to appealing local identity to visitors. Accommodation facilities small scaled with single storey cottage type

(3) Executing Body

The project programme shall be executed by Krakatau Tourism Development Corporation, KTDC, joint corporation of Lampung Province, BTDC and private enterprises and new Krakatau Marine Reserve Corporation, established fully by public sector, i.e. Nature Conservation Office tourism related authority and agencies for the benefit of nature conservation of Krakatau Reserve.

(4) Targetted Market and Type of Stay

The project is mainly targetting upon foreign tourists and Jakarta residents from Europe. They are quite familiar to safari type tourism which sometimes needs visitors to put up with poor facilities. The project is aiming establishment of quite new type tourism development in Indonesia, it must be considered to establish the fame of this development steadily rather than to rush to expand its market.

As the planned resort is characterised as a stationing point to Krakatau, length of stay is quite limited, over-night or two. Of course, long-stay tourists who want to enjoy quiet time and atmosphere of an isolated island are welcome.

(5) Land Use

Overall land use scheme of 2.0 ha site is shown below :

1)	Accommodation	1.2 ha
2)	Administration	0.3 ha
3)	Beach	0.5 ha

(6) Facility Development

Facilities planned on Sebesi Island are shown on the following table.

Table 5.1.2 Facilities of Sebesi Island Stationing Resort

Facility	Area per Unit	No. of Unit	Total Area (sq.m)	Remarks
1) Cottage	100	10	1,000	-cottage, two rooms battery type -35 sq.m each -single storeyed with thatched roof -coverage ratio in acc. zone : 8.3%
2) Restaurant/Cafe	120	1	120	-restaurant/cafe for 40 guests -mini-museum and suovenier corner
3) Sea-Side Cafe/Bar	30	1	30	-cafe/bar for 20 guests and visitors
4) Reception /Office	40	1	40	
5) Staff Accommodation				
a) Manager	50	1	50	
b) Managing staffs	30	3	90	
c) Employees	20	10	200	
d) Dining/meeting hall	30	1	30	
Sub-total			370	
Total			1,560	-overall coverage ratio : 7.8%

(7) Cost Estimation

Cost estimation of Sebesi Island Stationing Resort is shown as follows :

Table 5.1.3 Cost Estimation of Sebesi Island Stationing Resort

(Unit:US\$)				
Item / Facility	Unit	Quantity	Unit Cost	Total
1) Land Aquisition	sq.m	20,000	0.5	10,000
2) Land Reclamation	sq.m	20,000	3.0	60,000
3) Superstructure				
a) Cottage	sq.m	1,000	250	250,000
b) Restaurant / cafe	"	120	300	36,000
c) Sea-side cafe / bar	"	30	150	4,500
d) Reception / office	"	40	300	12,000
e) Staff Accommodation	"	370	250	92,500
Sub-total		1,560		395,000
4) Storm Drainage	m	50	250	12,500
5) Sewage	-	L.S.	-	500,000
6) Power Supply	no.	3	10,000	30,000
7) Water Supply	-	L.S.	-	100,000
8) Telecommunication	set	1	10,000	10,000
9) Miscellaneous				
a) Gate, fence	-	L.S.	-	50,000
b) Landscaping	sq.m	2,000	4	8,000
Sub-total				58,000
Total				1,175,500

5.1.6 Marine Transportation Improvement

Marine transportation improvement is an essential part of Krakatau tourism development. To invite and transfer tourists from main market, Jakarta, and to develop tourism of Sunda Strait and Lampung Bay, more frequent and attractive transportation network and system is required.

Proposed network for tourism development is as follows :

- (1) Primary line : Large capacity jet foil
 - 1) Jakarta-M.Belantung-B.Lampung
- (2) Secondary line : Medium capacity speed boat
 - 1) Merak-M.Belantung-B.Lampung
 - 2) B.Lampung-Sebesi-Krakatau
 - 3) Labuhan-Sebesi-Krakatau
- (3) Thirtiary line : Small capacity motor boat between

- 1) B.Lampung
- 2) M.Belantung
- 3) Canti
- 4) Bakauheni
- 5) Kuala Kambas
- 6) Merak
- 7) Anyer
- 8) Pasauran
- 9) Labuhan
- 10) Ciduan
- 11) Sebesi
- 12) Anak Krakatau

For operating these lines, it is estimated that four mediumcapacity speed boats, and ten small capacity sophisticated motor boats supported by traditional Kapal Motors existing.

The cost is estimated at US\$ 2,400,000 as detailed in Table 5.1.4 below.

Table 5.1.4 Cost Estimation for Marine Transportation Improvement

(Unit : US\$)				
Item	Unit	Quantity	Unit Cost	Total
1) Speed Boat	no	4	250,000	1,000,000
2) New Motor Boat	no	10	100,000	1,000,000
3) Operation System	-	L.S.	-	400,000
Total				2,400,000

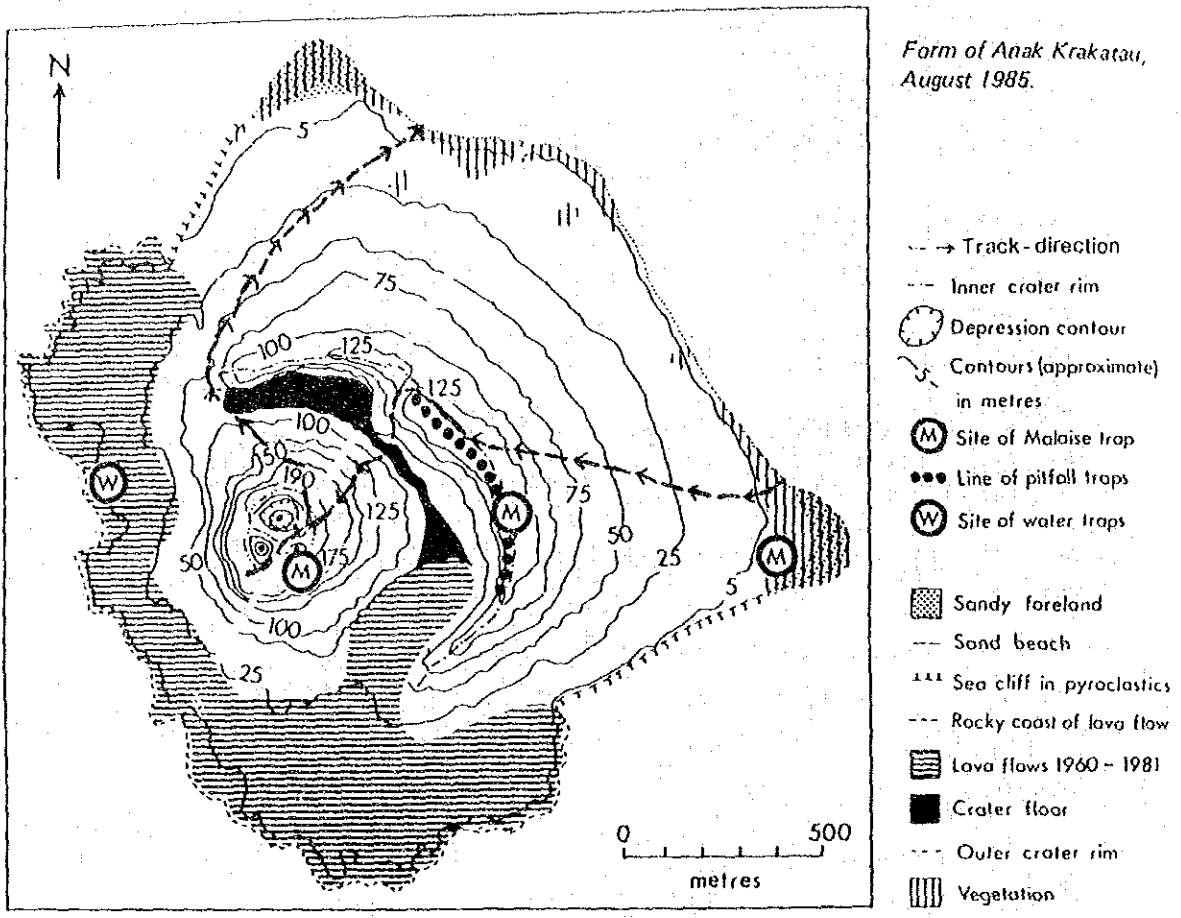


Figure 5.1.1 Map of Anak Krakatau

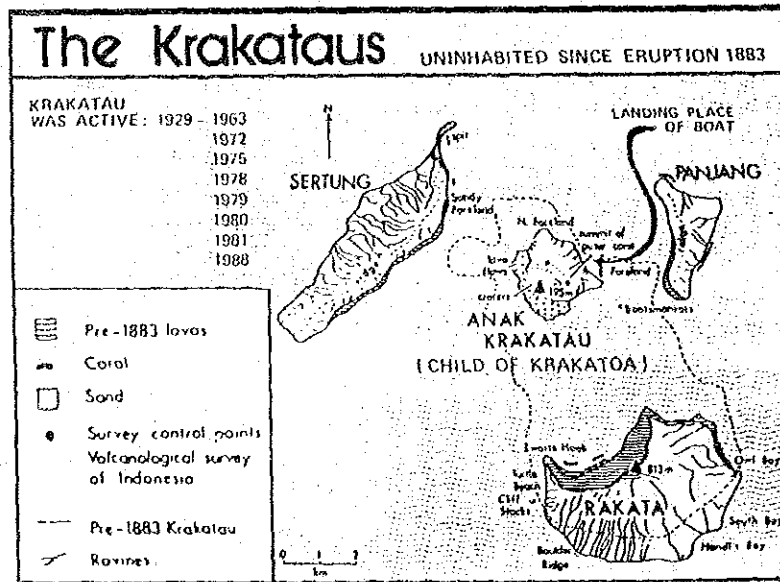


Figure 5.1.2 Krakatau Islands

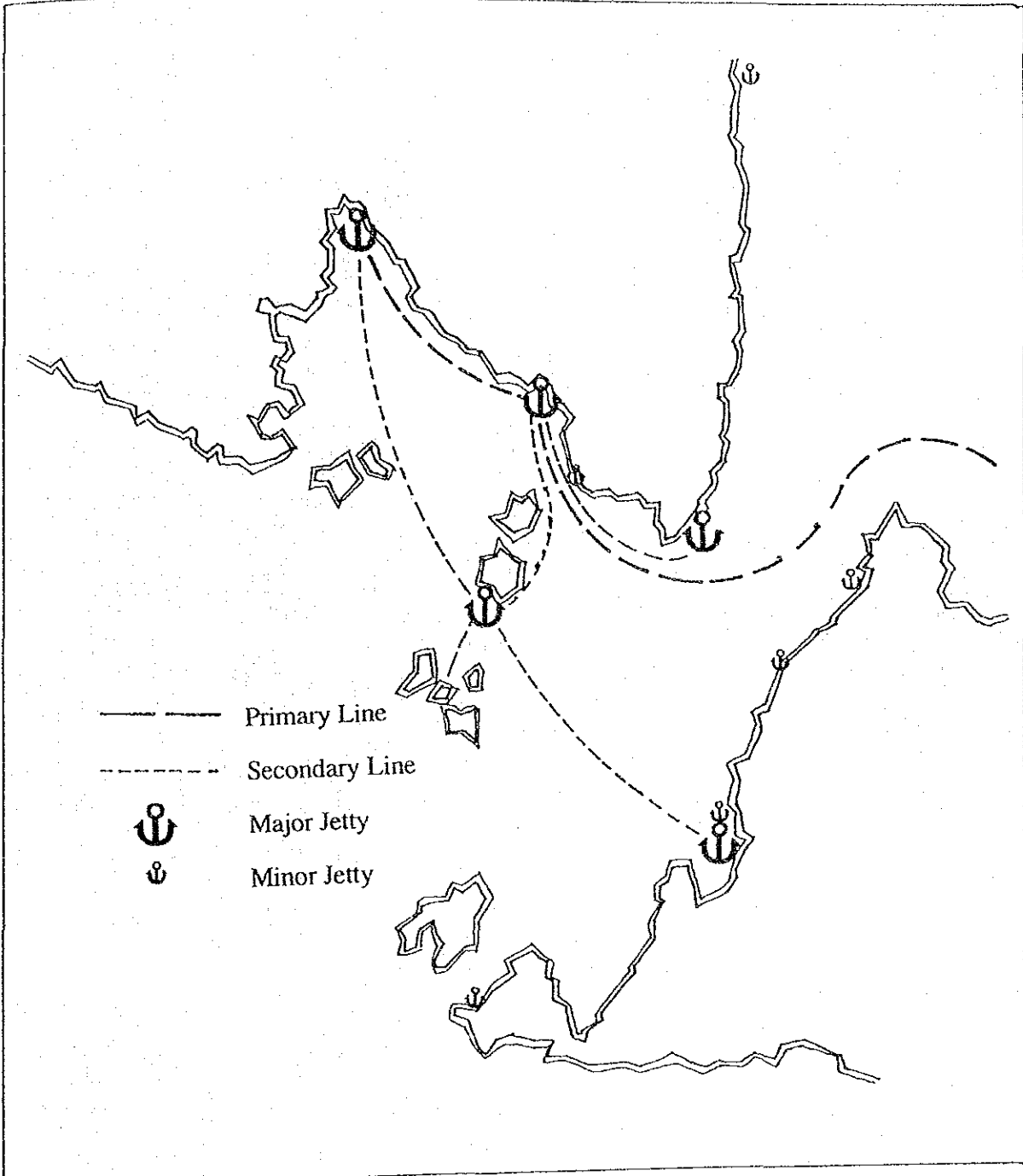


Figure 5.1.3 Proposed Cruising Route

Length Overall: 31.00 m
 Breadth (mld.): 6.30 m
 Depth (mld.): 3.30 m
 Draft (design): 1.20 m
 Gross Tonnage: abt. 200 tons
 Cruising Speed: abt. 29 knots
 Cruising Range: abt. 250 N.M.
 Main Engine: Diesel Engine
 2,420 PS x 2 sets

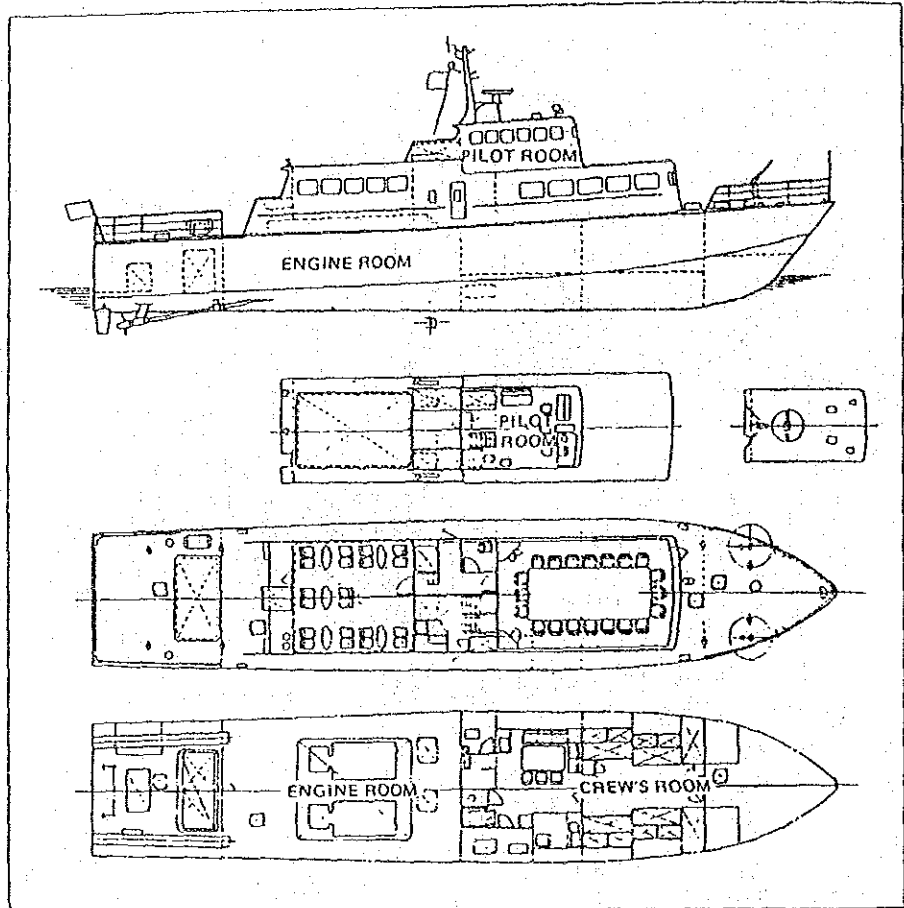


Figure 5.1.4 Typical Cruising Speed Boat

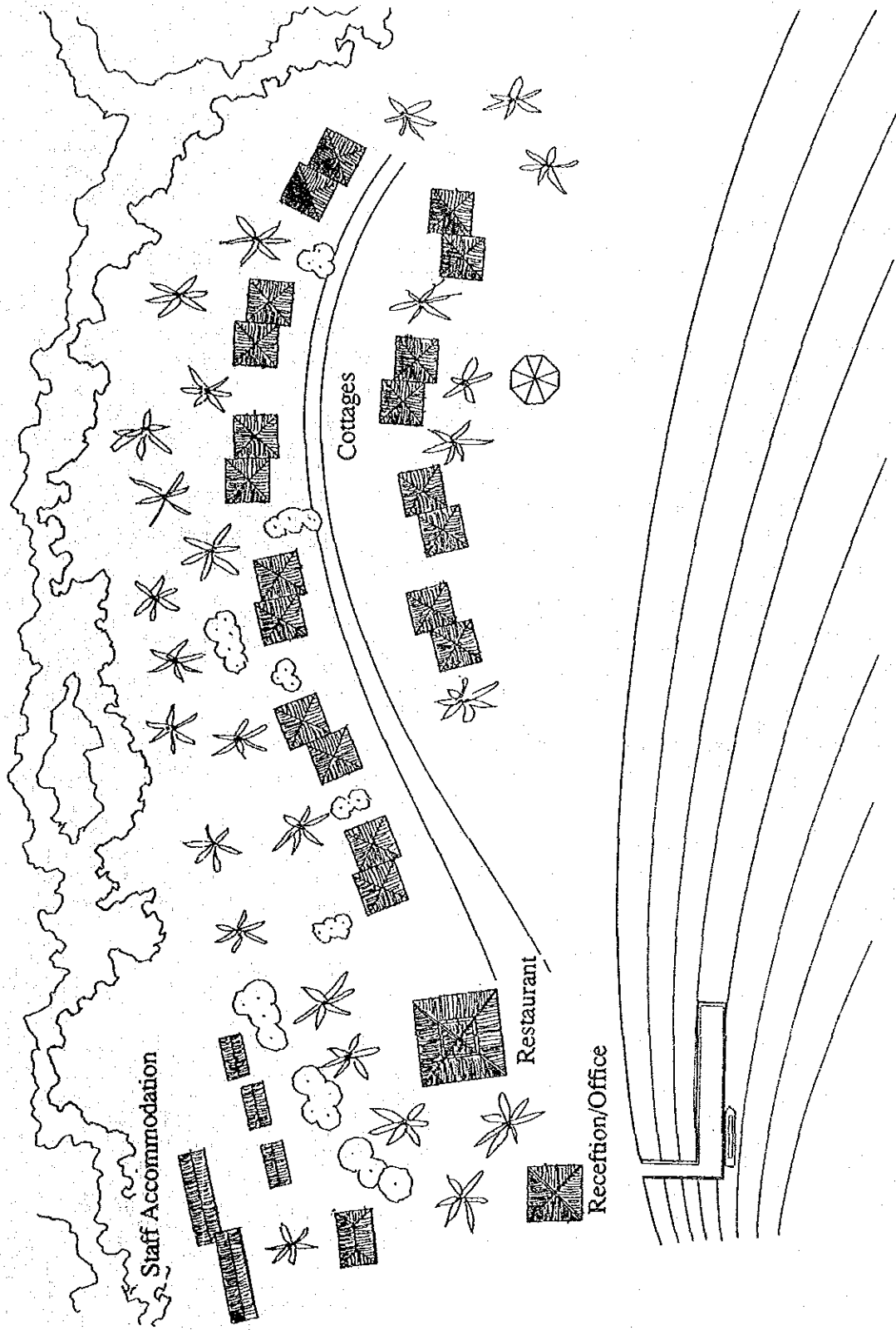


Figure 5.1.5 Image Sketch of Sebesi Island Stationing Resort

5.2 WAY KAMBAS NATIONAL PARK TOURISM DEVELOPMENT

5.2.1 What is Way Kambas?

Way Kambas is one of the oldest reserves in Indonesia which declared in 1937 and designated a national park in 1973. It covers about 1,450,000 ha along the eastern coast of Lampung. The land is low with its highest point of 225 m. Along the coast stretches vast swampland and western part is covered by jungle forest. Famous elephant, there lives 300 wild, and 60 are in training centre. It is said that it takes two years to train enough.

5.2.2 What is Today's Way Kambas Tourism?

Way Kambas trip is now arranged from Bandar Lampung. It is about 100 km, 2 hours drive to Pintu Gerbang Pertama, gateway town of Way Kambas, and 6 km more to Plang Hijau, gate control office of the park.

There are two touristic attractions. One is Elephant Training Centre which is famous and popular to tourists. The centre has some facilities; centre's office, souvenir and snack shops, picnic site, elephant exhibition yard, visitor centre, watch tower, elephants' pool and famous football court. The centre offers some attractions. Elephant training classes and football is exhibited five days a week, and elephant safari two days.

Another attraction is Way Kanan-Way Kambas river cruise. This is not famous and popular as the Elephant Training Centre, but is quite exciting one and is to be said the best cruise in Sumatra. It takes about two hours from Way Kanan to Kuala Kambas. Many animals and, particularly birds can be observed with changing vegetation background. At the starting point of the cruise is Way Kanan Lodge. The only accommodation facility in the park with 12 rooms, 24 beds. At present is still a poor facility, one has to bring all of one's food, but the park office has a wish to improve it.

Nature Conservation Office of Lampung reports that 69,576 visitors, domestic: 68,351, foreign: 1,225, visited the park. Annual growth rate reaches 189.8%. On the contrary, Way Kanan is visited by few people. Average number of visitors is 318 per annum and shows no growth.

Table 5.2.1 Visitor Registered to Way Kambas National Park

	Foreign	Domestic	Total
1986	40	2,783	2,823
1987	85	7,717	7,802
1988	10	10,553	10,563
1989	366	10,502	10,868
1990	753	35,092	35,845
1991	1,225	68,351	69,576
Ann. % C.	198.3	189.7	189.8

Source : SBKSDA, B. Lampung

Table 5.2.2 Visitor Stayed at Way Kanan Lodge

	Foreign	Domestic	Total
1987	84	234	318
1988	82	264	346
1989	141	168	309
1990	105	193	298

Source : SBKSDA, B. Lampung

5.2.3 Why Way Kambas ?

Way Kambas, famous for wild elephants, is also famous among tourists and students who want to observe wildlife of any kind. There, tiger, tapir, deer, wild-pig and many kinds of monkeys, and birds. The park is a treasury of Sumatran wildlives. In the park, there established elephant training centre, where elephants are trained as helpful friends for mankind. Its area of 128,450 ha has been reserved carefully by Nature Conservation Office of Lampung.

Way Kambas is one of the most favorite weekend holiday destination for Lampungese, offering recreation, amusement, relaxation and social education for children. Way Kambas National Park is working steadily as it is expected as a national park. It can be found, however, that there are much more space to develop. There seems three tasks for the park. The first is to increase more attractions as an amusement park for common people, especially to school pupils. The second is to grade up social education factor for environmental conservation which the world is facing. These two must be discussed together. The third is to introduce Sumatran rich nature and show them a way to enjoy it

Through these attempts, Way Kambas can be a real pilot park of Sumatra to show the answer the question, "how can national parks can be developed for common wealth?".

5.2.4 Project Components

Project proposed consists of components below :

- 1) Way Kambas Jungle Lodge Development
- 2) Facility Improvement of the National Park

5.2.5 Way Kambas Jungle Lodge Developmet

(1) Project Site

It is located 500 m east of Way Kanan existing lodge

(2) Development Policy

1) Harmony with Existing Environment

It is required the superstructure to merge into surrounding, like camouflaging from main targets, wildlives. At the same time, it must be a symbol as a pioneer project of "jungle tourism", may be a prior example to Berbak National Park.

2) Minimum Facility with Maximum Service

Way Kambas tourism has a purpose to promote eco-tourism. Thus all the facilities are expected to have minimum environment impact. Facilities planned should have minimum superstructure and infrastructure. Instead of luxurely physical service, it is expected to provide high quality service to answer qualified tourists for enjoying island over-night stay. What is essential is able guides to answer any kind about jungle, swamo land, fauna, flora and ELEPHANT.

(3) Executing Body

Joint business of existing Way Kambas National Park Corporation and private enyerprises. Must be controled by Nature Conservation Office and the Park Corporation.

(4) Targeted Market and Type of Stay

Targeted market is European adventure and nature oriented tourist who want intelectual stimulation. They deeply understand what is Eco-Tourism, and agressible in mind. These kind of tourists are leading tourists who build up a reputiom among foreign tourists. They are expcted to know how to stay in incovenient jungle and understand the way of safari tourism.

(5) Land Use

Overall land use of 0.5 ha scheme is shown below

1) Accommodation	:	0.2 ha
2) Multi-purpose garden	:	0.2 ha
3) Administration	:	0.1 ha

(6) Facility Development

Facilities planned in Way Kambas Jungle Lodge are summarized as shown on the table below.

Table 5.2.3 Facilities of Way Kambas Lodge

Facility	Area per Unit	No. of Unit	Total Area (sq.m)	Remarks
1) Lodge	35	18	840	-floor workability 75%
			420	-18 units of 35 sq.m twin rooms
Sub-total			1,260	-2 storeyed
				-raised floor and thatched roof
2) Restaurant/Office	150	1	150	-single storeyed, thatched roof
				-restaurant for 36 guests
				-office for 2 managers
3) Staff				
Accommodation				
a) Managers	50	2	100	
b) Managing staffs	30	3	90	
c) Employees	20	10	200	
d) Dining /meeting hall	30	1	30	
Sub-total			420	
Total			1,830	

(7) Cost Estimation

Table 5.2.4 Cost Estimation of Way Kambas Jungle Resort

					(Unit:US\$)
Item / Facility	Unit	Quantity	Unit Cost	Total	
1) Land Aquisition	sq.m				-
2) Land Reclamation	sq.m	5,000	1.5		7,500
3) Superstructure					
a) Cottage	sq.m	840	250		210,000
b) Restaurant / cafe	sq.m	150	300		45,000
c) Staff Accommodation	sq.m	420	250		105,000
Sub total	sq.m	1,410			360,000
4) Storm Drainage	m	50	250		12,500
5) Sewage	-	L.S.	-		200,000
6) Power Supply	no.	2	10,000		20,000
7) Water Supply	-	L.S.	-		50,000
8) Telecommunication	set	1	10,000		10,000
9) Miscellaneous					
a) Gate, fence	-	L.S.	-		50,000
b) Landscaping	sq.m	5,000	4		20,000
Sub total					70,000
Total					730,000

5.2.6 Facility Improvement of the National Park

(1) Elephant Training Centre Improvement

Present elephant training centre became so small and poor for for the requirement of further development and more sophisticated service. It is planned restoration and new constructions, including :

- 1) New guest centre : 100 sq.m, wood
- 2) Mini museum : 50 sq.m, RC
- 3) Picnic facilities : 100 sq.m (total), wood

(2) Supporting Infrastructure Improvement

For the development of new elephant resort, it is required to develop transportation and service system to support the resort. It can be listed as below;

- 1) Road improvement
 - a) The entrance -Way Kanan , 1.3 km dirt
 - b) The entrance -Elephant training centre, 0.9 km paved
 - c) Elephant training centre -Elephant camp , 0.3 km dirt

- 2) River transportation
 - a) River cruise facilities
 - i) Floating pontoon dock ,
 - ii) Way Kanan
 - iii) Kuala Kambas
 - b) Flat bottom motor boat , 4 unit

5.2.7 Cost Estimation

Table 5.2.5 Cost Estimation of Way Kambas National Park Facility Improvement

(Unit : US\$)				
Facility	Unit	Quantity	Unit Cost	Total
1) New Guest House	sq.m	100	250	25,000
2) Mini Museum	sq.m	50	450	22,500
3) Picnic Facilities	sq.m	100	100	10,000
4) Road:The Entrance-Way Kanan	1.3km	1.3	25,000	32,500
5) Road:The Entrance-ETC	0.9km	0.9	50,000	45,000
6) Road:ETC-Elephant Camp	0.3km	0.3	25,000	7,500
7) Pantoon Dock	-	2	500	1,000
8) Boat, Motorized Pantoon	-	4	1,000	4,000
Total Cost				147,500

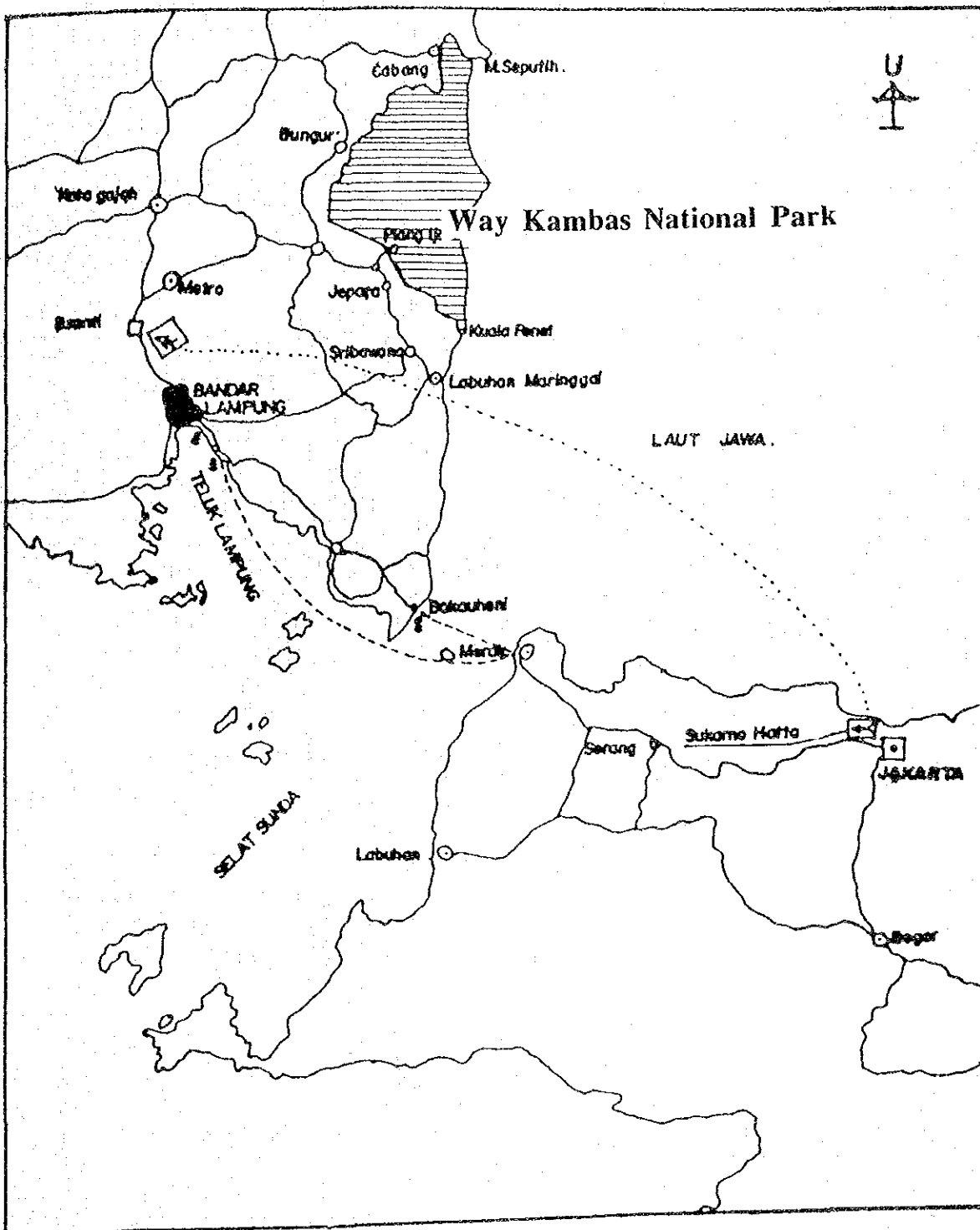
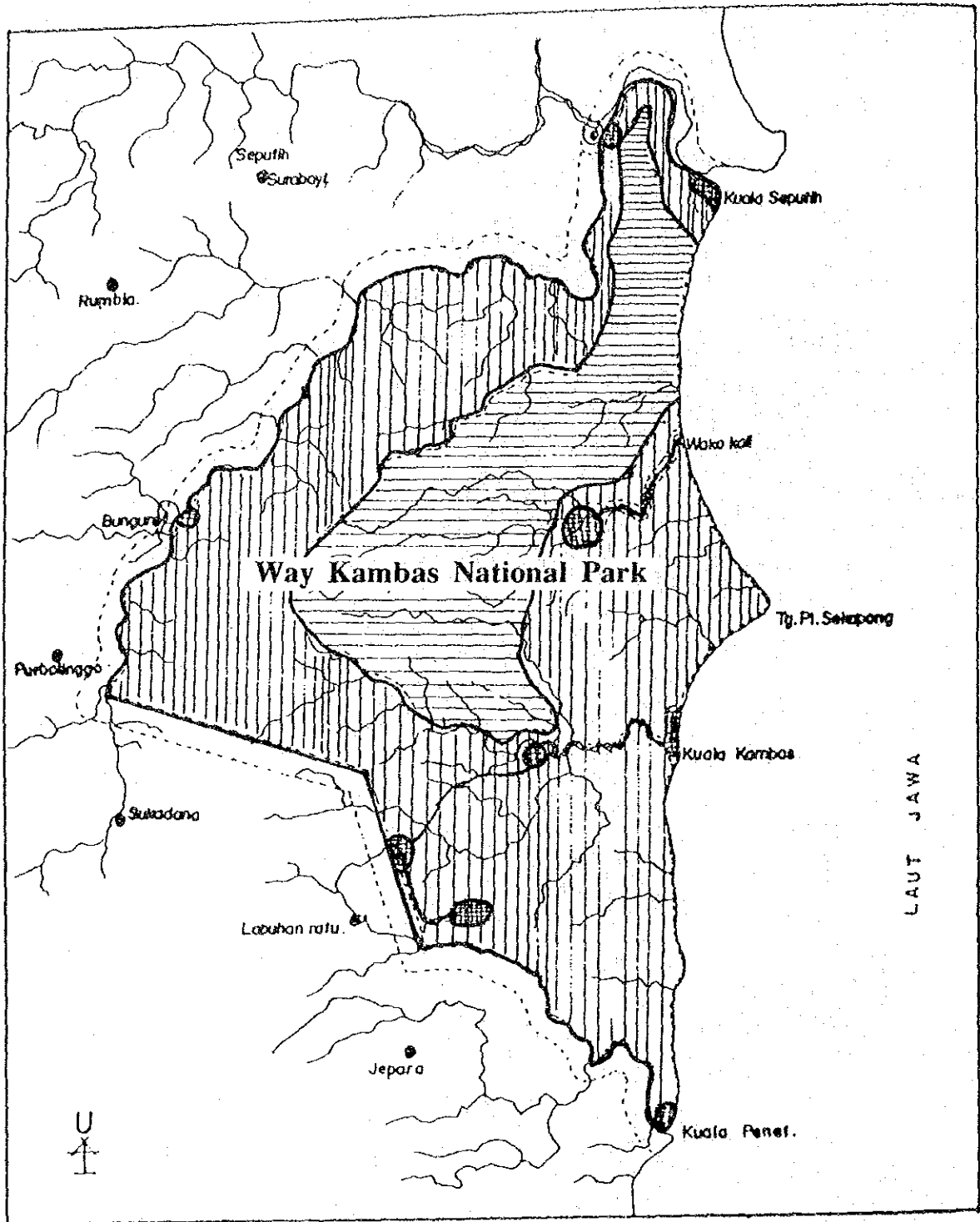


Figure 5.2.1 Location of Way Kambas National Park



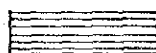

-  Strict Reserved Area
-  Development Area

Figure 5.2.2 Zoning of Way Kambas National Park

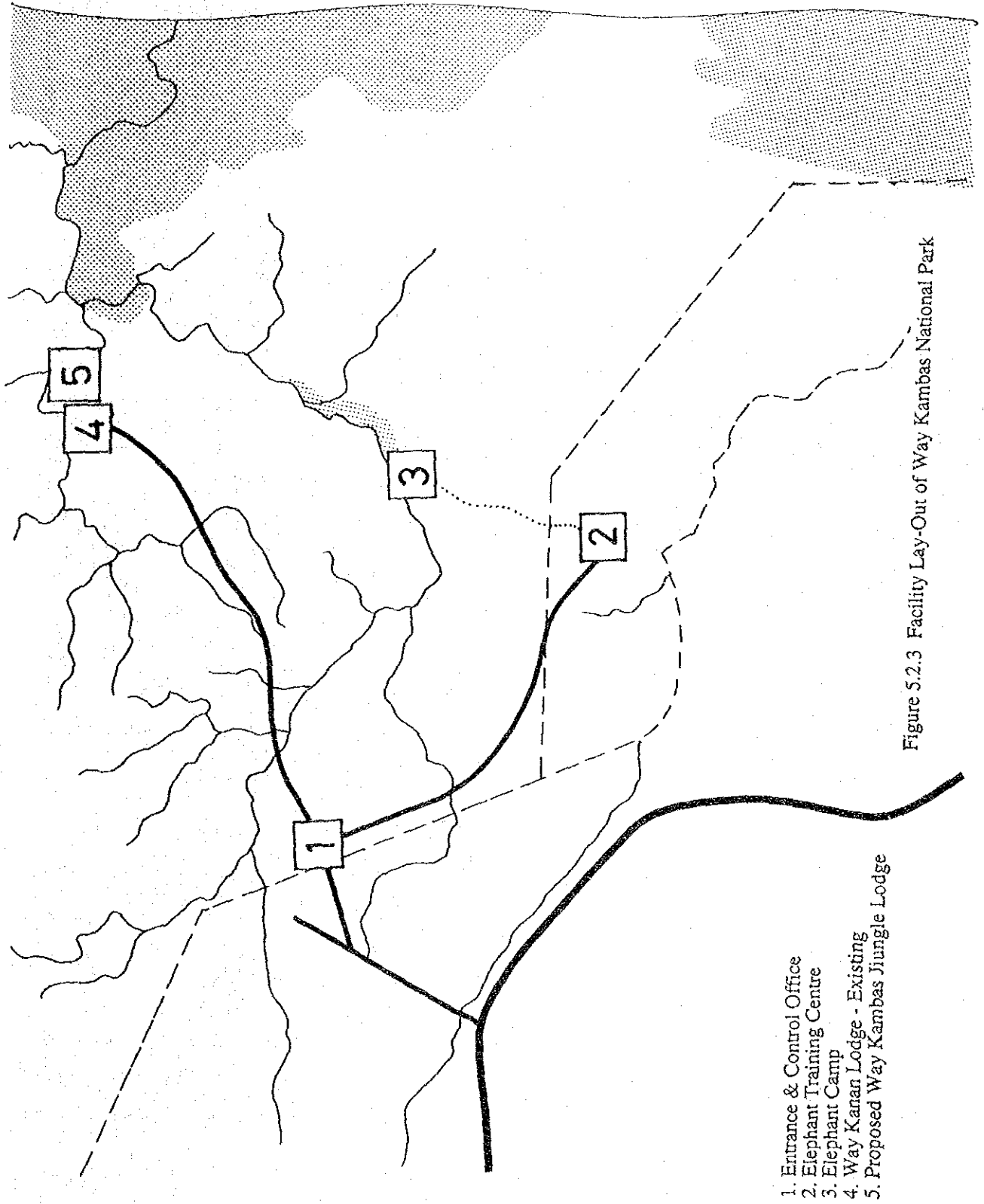


Figure 5.2.3 Facility Lay-Out of Way Kambas National Park

- 1. Entrance & Control Office
- 2. Elephant Training Centre
- 3. Elephant Camp
- 4. Way Kanan Lodge - Existing
- 5. Proposed Way Kambas Jiungle Lodge

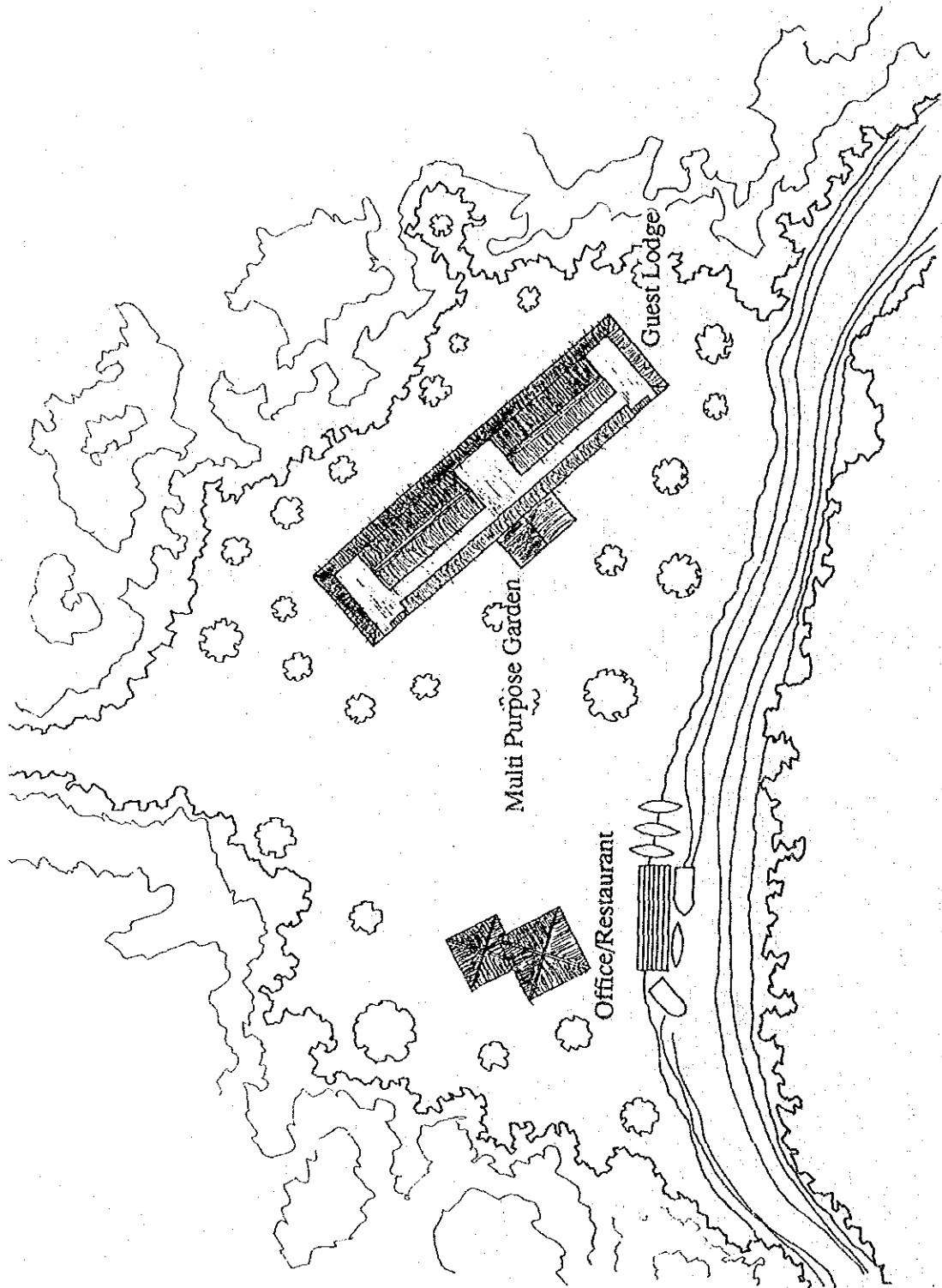


Figure 5.2.4 Image Sketch of Way Kambas Jungle Lodge

6. WATER RESOURCES

6.1 Way Semangka Hydropower Development Project

6.1.1 Background of the Project

The Study on "The Integrated Regional Development Plan for The Southern Part of Sumatra" is now being undertaken, and the development concept of the whole region was identified. "The gateway Triangle", composed of Palembang, Lampung and Batraja is defined to lead the further economic growth of the region and the captioned hydropower development is one of the main components of "The Integrated Development Plan (IDEP)" for the Bandar Lampung and Lampung Selatan, where is the strategic important area for the further economic growth of the southern part of Sumatra.

Stable electric energy supply to Bandar Lampung and Lampung Selatan is the key factor for the further development of the area. Because the two main sectors, industry and tourism will be core sectors for the development. However, the both important resources of electric energy and water are currently insufficient to support the above core sectors encouraging the investment for development. Current electric power supply for Bandarlampung and Lampung Selatan is mainly depended on the diesel power plants in the area, and the most of major industrial electric energy consumers have their own diesel plants and provide electric energy by themselves. It can be additionally expected to supply from Bukit Asam coal thermal power plant through the transmission line with the capacity of 150 KV, which is under-construction and will be completed in the near future. Huge potential of coal mining exists in the southern part of Sumatra, particularly in Bukit Asam in South Sumatra Province, where is expected the further electric energy supply base for the region. This coal mining is however, mainly transported to Jakarta and Surabaya in Java, and for export to foreign countries. The regional income by coal market is currently major income source for the region. Therefore, strategic utilization of coal mining is required for the further regional economic growth.

On the other hand, electric energy supply by hydropower station is the one of the attractive alternatives of the coal thermal power station. The hydroelectric power generation is sustainable and less operation and maintenance cost. In addition, the huge hydropower development potential is still remained especially in the western mountainous zone in the southern part of Sumatra.

Way Semangka River is assumed to have mainly three advantages for the early implementation of the hydropower development, the closer location to the demand site of Bandarlampung city, relatively abundant stream flow through the year, and steep river gradient. Accordingly, the JICA Study Team has taken "Way Semangka River Basin Hydropower Development Project" as the Pre-Feasibility Scheme within "Integrated Regional Development Plan for The Southern Part of Sumatra" (LTA-129).

6.1.2 Description of the Basin

Way Semangka River is originated in the southern edge of Bukit Barisan Range, flow the south-east ward to Semangka Bay in Lampung Selatan. The catchment area of the basin is estimated 2,100 km² at the estuary. Figure 6.1.1 shows the map of Lampung Province, indicating Way Semangka River basin, which is located about 100 Km westward from Bandarlampung City.

The characteristic of the basin topographic condition is steep with 0.893 % of river gradient from Liwa to the estuary with a river length of 84 Km. Swampy plateau with gentle gradient of 0.192% exists along the middle reach of the Way Semangka River, where residents cultivate paddy field by simple irrigation system using spring. Many hot springs are

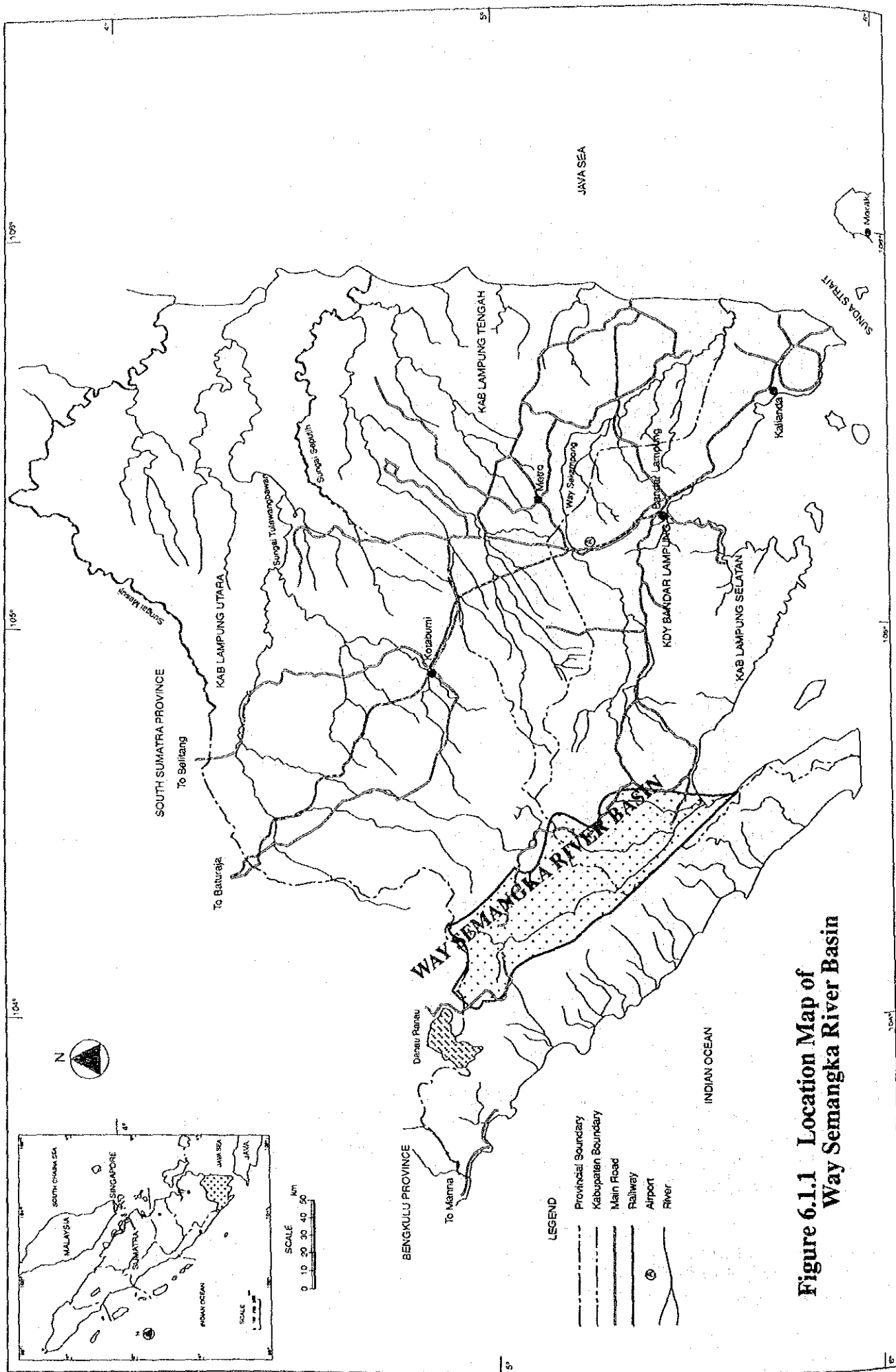


Figure 6.1.1 Location Map of Way Semangka River Basin

found in the plateau, indicating the volcanic activities in the basin. There are nine lakes in the plateau, expected high tourism development potential.

An important regional structural feature in Sumatra supported to be closely associated with the presumed nape structures, is called as Great Sumatra fault zone. Way Semangka river is situated upon the fault zone of which width is more or less 2 km with the same south-eastward trend as river. The volcanic activity is also found frequently along the Great Sumatran Fault.

There are two rainfall/water level gauges operated by the provincial office of Ministry of Public Works (P3SA) in the river basin, on Liwa in upstream and on Srikaton (or Srikuncoro) in the downstream with around 15 years of the daily observation record although intermitted frequently by un-recorded. There is no observation record for sediment load in the two gauges. In addition, State Electric Company (PLN) has commenced hydrological observation in 1990, by means of three water level gauges on Way Semung River, major tributary of Way Semangka River. Meteorological data is detailed in Appendix A6.1.

Mean monthly rainfall record is shown in Figure 6.1.2 and Table 6.1.1 below. Dry season is observed in the upstream basin represented Liwa, for three months between June and August has relatively less precipitation more or less 100 mm/month. On the other hand, Srikaton in the downstream is not clearly observed dry season. Annual rainfall varies between 1,500 mm and 4,000 mm by year, and an average basin rainfall is estimated more or less 2,500 mm.

Table 6.1.1 Features of Semangka-3 Scheme in HPPS

Scheme	Type	Power (MW)	Energy (GWh)	Cost (US\$ mil.)
Semangka-3	Dam & Reservoir	110.4	550.6	353.5

Source: Hydro Power Potential Study, 1983 IBRD.

Annual average runoff is calculated 13.9 m³/s on Liwa with a catchment area of 243 Km², and 72.3 m³/s on Srikuncoro with a catchment area of 1,413 Km². Annual basin runoff depth is calculated 1,803 mm/year for Liwa basin, and 1,613 mm/year for Srikaton basin, remarked high annual rainfall-runoff ratio between 60 and 70 percent. The flow duration curve recorded at Srikaton from 1974 to 1991 indicates stable runoff through the year. The runoff can guarantee 41 m³/s with 80% dependability and 20 m³/s with 95% dependability at Srikuncoro gauge site.

The most part of Way Semangka River basin is covered by national park and protection forest area, where is restricted human settlement, cultivation and commercial logging. The mineral exploration is generally permitted in the national park and protection forest area although careful development is required.

6.1.3 Development Potential

In the view of topographic condition, there are three hydropower development potential sites, compiled of 7 schemes, in Way Semangka River basin, Upper Semangka, Lower Semangka and Way Semung. Figure 6.1.2 shows the location of respective potential site. Upper Semangka potential site is located in Kabupaten Lampung Barat on the mainstream of Way Semangka between Umbulanmenguk village and the confluence of Way Pila. The river length is 18 Km with the difference of elevation of 420 m. Lower Semangka potential sites is located in Kabupaten Lampung Selatan with a head of 175 m between Tugurato and Tulunasahan villages with a river length of 7 Km. Way Semung potential site is located on Way Semung River in Kabupaten Lampung Selatan with a head of 386 m. Figure 6.1.3 shows the longitudinal section of the main stream of Way Semangka River, indicating the both of Upper and Lower Semangka schemes are located in the sections with steep river gradient.

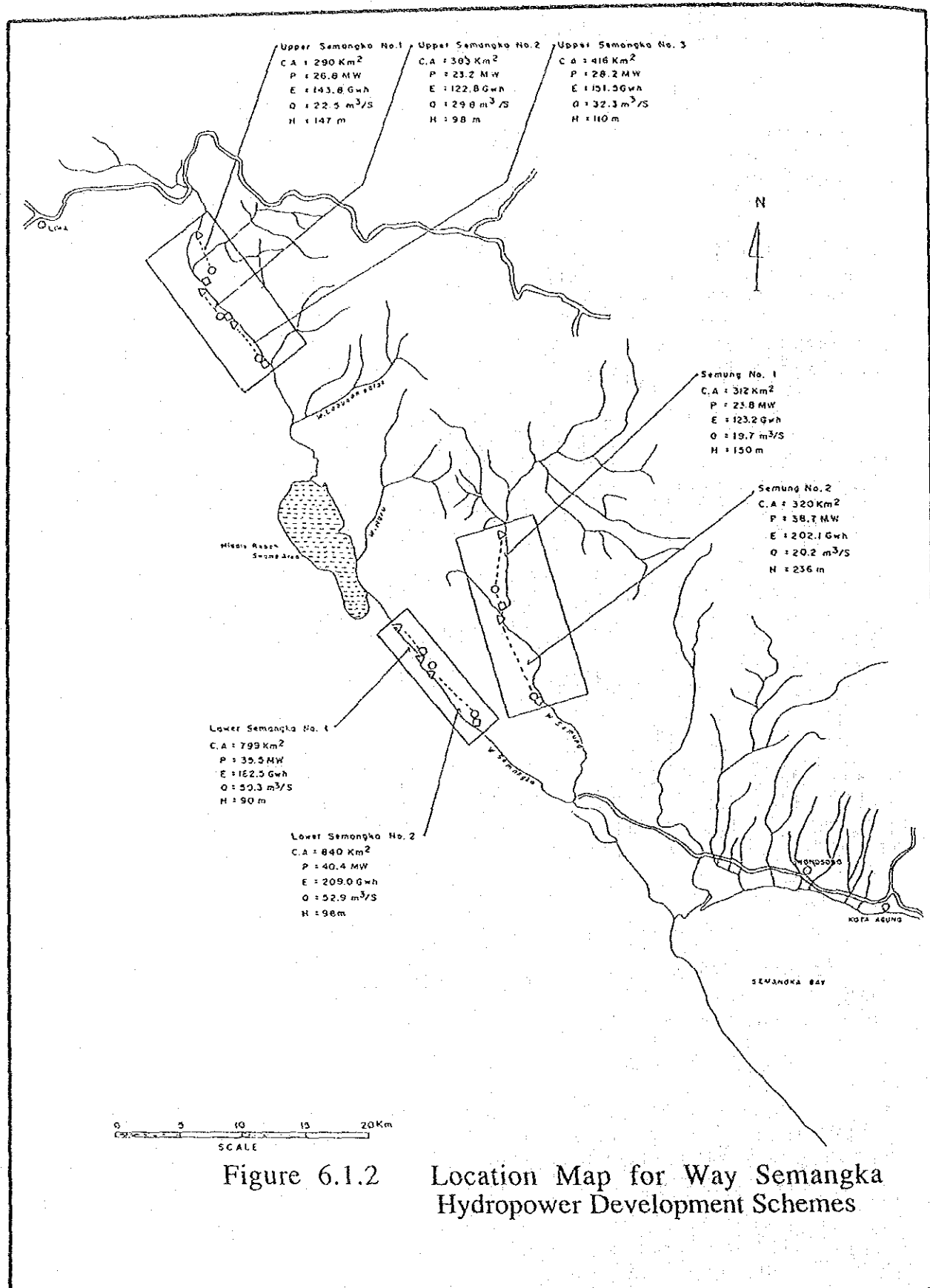
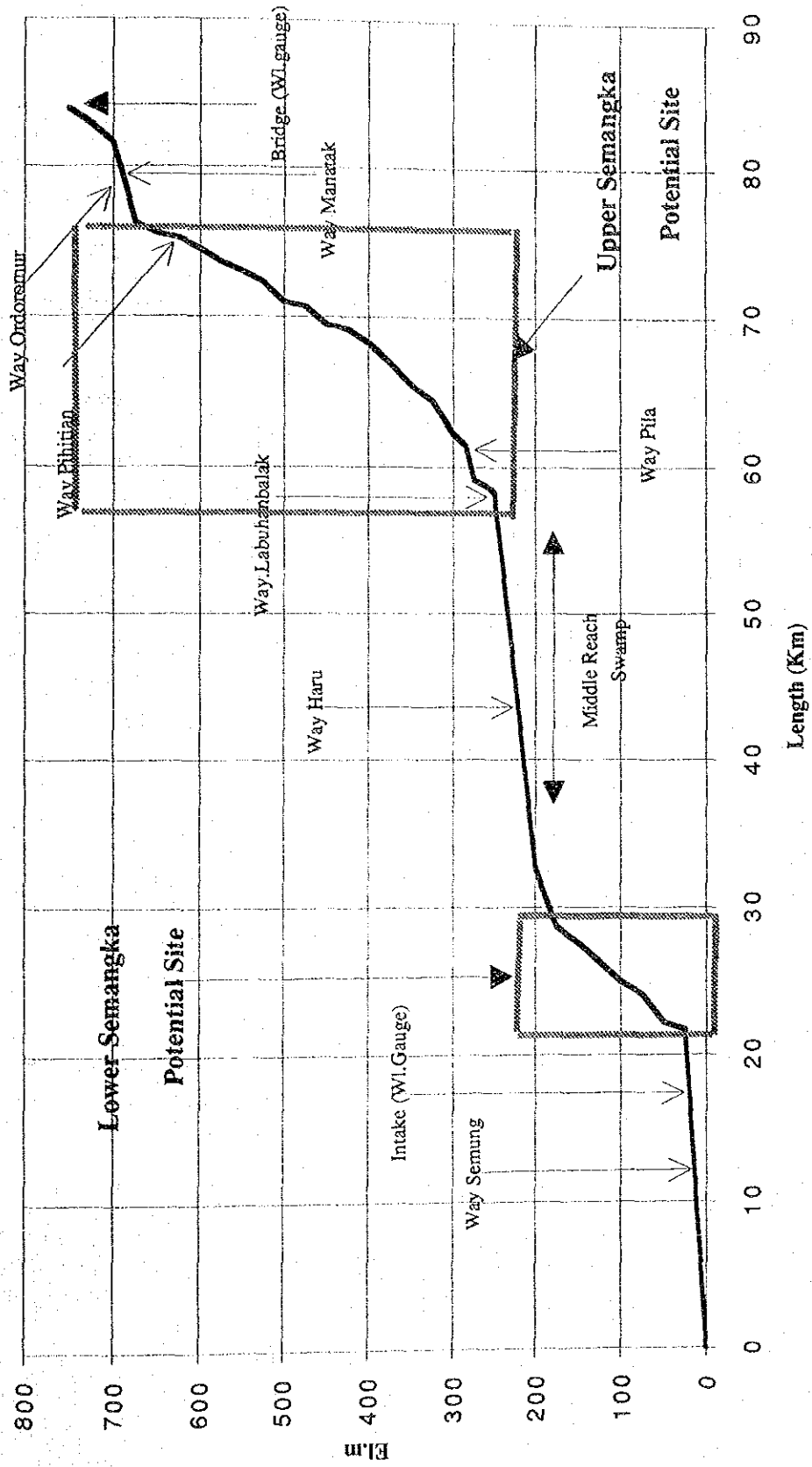


Figure 6.1.3 Longitudinal Section of Way Semangka River



Hydropower development potential on Way Semangka River basin has firstly identified on "Hydro Power Potential Study (HPPS)" by Nippon Koei Co.,Ltd and Pt.Indra Karya in 1983 financed by World Bank. This study covered whole Indonesia and selecting the priority development sites among the 1,275 candidate schemes including 9 schemes in Way Semangka River basin.

Among them, only Semangka-3 scheme has passed both 1st and 2nd screening together with the other 128 schemes in whole Indonesia. However, it was also dropped at 3rd screening due to geological difficulty. HPPS has finally selected 47 schemes as the priority development projects. The feature of dropped Semangka-3 scheme is shown in Table below.

In 1990, reconnaissance survey for the Way Semangka River Basin was made by Japanese Consultant, TEPCO. The previous schemes were reviewed and all the schemes were modified as run-of-river type without dam and reservoir. The modified schemes are shown below:

Table 6.1.2 Revised Way Semangka Hydropower Development Schemes

Name of Scheme	CA (km ²)	P (MW)	E (GWh)	Q (m ³ /s)	H (m)
Upper Semangka-1	290	26.8	143.8	12.5	147
Upper Semangka-2	383	23.2	122.8	29.8	98
Upper Semangka-3	416	28.2	151.5	32.3	110
Lower Semangka-1	799	35.5	182.5	50.3	90
Lower Semangka-2	840	40.4	209.0	52.9	98
Semung-1	312	23.8	123.2	19.7	150
Semung-2	320	38.7	202.1	20.2	236
Total	-	216.6	1134.9	-	-

Source: PLN, Lampung

These modification is assumed to be attractive the Way Semangka Hydropower Development. Because, the geological difficulty can avoid not to construct high dam, and in-advantage of regulation effect seems not to be serious due to the basin hydrological condition with less fractuation of river flow through the year. Particularly, Lower Semangka Schemes might be attractive because natural flow regulation effect is expected by the middle reach swampy plateau and 9 lakes.

6.1.4 Development Needs

(1) Basic Policy of National Electric Power Development

Java is currently the most serious as for the shortage of the electric power supply capacity, and PLN continues constructing mainly coal thermal and gas turbine power stations in Java as the urgent countermeasures. However, the bottle-neck of the extension of coal thermal power plants is the capacity of the coal transportation. The most of coal consumption in Java is currently transported from Bukit Asam in South Sumatra Province through the Sumatra Railway, and the capacity of the transportation has been already full. Accordingly, it is required the other countermeasures to supply electricity to Java with a long term view. There are mainly two alternatives, one is to construct Atomic Power Station in Java, and another is to connect by the under sea transmission line between Java and Sumatra.

As for the southern part of Sumatra, there are huge potential both of coal thermal power and hydropower development although the current power supply capacity is serious in shortage. Current development policy for the region is mainly to extend coal thermal plant rather than hydropower development. Because, there is an economic advantage to secure coal in the region, and hydropower development is difficult to compete to the coal thermal power