

Table 2.2.2 Fish Demand Projection

(1) Region's Consumption

Province	Required Volume (1,000 mt)				
	1990	1995	2000	2005	2010
Jambi	28.8	37.9	46.4	55.4	65.3
South Sumatra	116.6	116.7	141.3	167.2	194.8
Bengkulu	17.9	22.6	27.5	32.7	38.3
Lampung	87.4	109.2	129.4	151.4	175.8
Region Total	250.8	286.4	344.6	406.7	474.2

(2) Export

Destination	Required Volume (1,000 mt)				
	1990	1995	2000	2005	2010
Java (incl. export from Jakarta)	25.0	40.3	64.8	104.4	168.2
Direct export	2.3	3.7	6.0	9.6	15.5
Total	27.3	44.0	70.8	114.0	183.7

(3) Total

	Required Volume (1,000 mt)				
	1990	1995	2000	2005	2010
Total Demand	278.1	330.4	415.4	520.7	657.9
Import from N. Sumatra	10.0	11.9	13.9	15.9	17.7
Balance	268.1	318.5	401.5	504.8	640.2

Notes:

- *1/ Per capita fish consumption is assumed to increase from 16.2 kg in 1990, to 16 kg, 17 kg, 18 kg and 19 kg in 1995, 2000, 2005 and 2010 respectively (The fish consumption during first 5 years will increase only be the effect of population growth.)
- *2/ Population increase is based on the Teams's projection.
- *3/ Fish supply to other regions is assumed to increase at an annual rate of 10%.
- *4/ Import volume from Northern Sumatra is based on the projection given in the Final Report of the LTA-78 Study for Northern Sumatra (March 1990, JICA).

Based on the demand projection set forth in the above and the availability of marine fish resources and potentials for inland fishery and aquaculture production estimated by the Directorate General of Fisheries (DGF), the appropriate fish production targets are given in Table 2.2.3 below.

Table 2.2.3 Fish Production Target

(1) Jambi

	Target Volume (1,000 mt)				
	1990	1995	2000	2005	2010
Marine (east)	17	21	27	27	27
Inland fishery	4	4	5	6	7
Aquaculture	1	2	3	4	5
Total	22	27	35	37	36

(2) South Sumatra

	Target Volume (1,000 mt)				
	1990	1995	2000	2005	2010
Marine (east)	91	101	112	122	134
Inland fishery	38	38	43	48	53
Aquaculture	4	6	8	13	18
Total	133	145	163	183	205

(3) Bengkulu

	Target Volume (1,000 mt)				
	1990	1995	2000	2005	2010
Marine (west)	11	21	47	91	135
Inland fishery	1	1	3	6	9
Aquaculture	3	4	5	7	9
Total	15	26	55	104	153

(4) Lampung

	Target Volume (1,000 mt)				
	1990	1995	2000	2005	2010
Marine (east)	73	80	88	96	104
Marine (west)	3	9	23	45	67
Inland fishery	10	10	19	29	39
Aquaculture	11	14	18	25	32
Total	97	113	148	195	242

(5) Total

	Target Volume (1,000 mt)				
	1990	1995	2000	2005	2010
Marine (east)	181	202	227	245	265
Marine (west)	14	30	70	136	202
Inland fishery	53	53	70	89	108
Aquaculture	19	26	34	49	64
Grand Total	267	311	391	519	639

In order to meet the expected demand for fishes in 2000 (400,000 tons), it is necessary first to rapidly exploit and effectively utilize the coastal fish resources in the west coast, in addition to the gradual increment of marine fish catch from the east coast, and second to improve aquaculture industry. The demand would expand constantly along with the increase of population both in the Region and Java, and would reach 640,000 tons in 2010. Covering this fish volume, the offshore fish resources in the west coast (200-mile EEZ) must be exploited, while marine fish catch from the east coast and aquaculture production would be expected to constantly increase to the maximum extent. Inland fishery production should be also recovered to supplement the shortage of fish supply.

In these context, the concept for fish production during 1990-2010 would be summarized as follows:

1990-2000

- (1) Rapidly exploit coastal fish resources in the west coast (increase fishing capability in terms of fishing gear and boat)

- (2) Prepare for offshore fisheries development (develop the relevant fisheries infrastructure and upgrade fishermen's technical level)
- (3) Improve marine fishery status in the east coast (develop better fishing grounds and methods)
- (4) Rehabilitate inland water bodies to more fish productive by civil work (preparation for increase of inland fishery production)
- (5) Improve aquacultural infrastructure (water supply system, fish fry production system, etc.), and develop aquacultural technologies (diversification of culture species)
- (6) Diversify fish processing methods for better fish marketing
- (7) Upgrade capabilities of fishermen's cooperatives
- (8) Activate fishing villages for upgrading their living standard

2000-2010

- (1) Start and expand offshore fisheries operation, with particular emphasis on tuna fishing
- (2) Increase fish catch to the maximum level of exploitation in both east and west coastal waters under appropriate resources management
- (3) Upgrade inland fishery productivity through execution of appropriate fish stocking programs and water management
- (4) Increase aquaculture production through both extensification and intensification

2.3 ISSUES AND STRATEGY

(1) Sound Management of Marine Fish Resources in Eastern Waters

In the east coast of the Region, particularly in Jambi, fishing activities are extremely congested in the near coast such as river mouth where shrimp and jerry fish are mainly caught by using traditional gears. Due to the deforestation in the upper river basin and heavy siltation in the river mouth thereby, the coastal fish resources are also damaged more or less losing a spawning and growing-out grounds. The catch of marine fish in Jambi has been stagnating during the last decade, showing a tendency toward over-fishing in near shore water (within 2-3 miles from the coast). Thus, it is difficult to expect the further increase of fish production in the area if the current pattern of fishing activities is continued.

On the other hand, there is some capacity for further resources exploitation even in the 12-mile territorial water off east coast of the Region. In order to mitigate the present congested situation of fishing activities in the near shore, the following strategies will have to be considered.

- 1) Creation of new fishing grounds in more offshore waters within the 12-mile territorial water
 - a) Installation of artificial reefs and fish aggregating device (FAD)
 - b) Provision of effective information on fish resources to the fishermen
 - c) Establishment of village-based (cooperative-based) fish resources management system
- 2) Conversion of small-scale fishermen into aquaculture

- a) Establishment of aquaculture demonstration farms (brackishwater shrimp pond, mussel/cockle/oyster culture)

(2) Promotion of the West Coast as a Main Fish Supply Base

Due to the lack of fishery infrastructural facilities and the limited fishing capabilities both in technical and financial aspects in the west coast of the Region, the fishery activities in the west coast are less developed compared with the east coast. The potential fish stocks in coastal and offshore waters are therefore largely unused. It is enriched with pelagic fish resources particularly of tuna-like fishes. In addition, the shallow shelf waters around offshore islands, Pulau Enggano and Pulau Mega, consist of good fishing grounds for demersals. As well as the northern part of Sumatra, it would be indispensable to exploit fish resources in the west coast to satisfy the increasing local demand as a main fish supply base not only to the Region but also to Java. However, there are a limited number of fishermen in the west coast of the Region (less than 10% of those in the east coast or those in the west coast of the northern part). At present, some private fishing enterprises are operating in the west coast during a certain period of the year, but they bring back their catch to Jakarta because of no appropriate fish landing facilities and marketing channel. If these problems are solved, it will be expected to expand opportunities for fishing companies to operate fisheries having a base in the west coast of Sumatra. In addition, local small-scale fishermen will be developed step by step depending on level of each fisherman for promoting coastal fisheries development.

The following particular strategies will be adopted for achieving the objectives.

- 1) Establishment of fishing bases appropriate for offshore fisheries
 - a) Construction of Krui Fishing Port including refrigeration complex, fish market, workshop, etc.
 - b) Installation of fish refrigeration complex (ice making plant, cold storage, fish processing factory) in Pulau Baai fish landing center (PPI)
- 2) Enlargement of fishing capability
 - a) Introduction of tuna long-line fishing vessels (15-20 G/T) capable of being used for both long-lining and bottom lining
 - b) Introduction of purse seine fishing vessels (15-20 G/T)
 - c) Motorization of traditional boats and fishing gear development

(3) Full Utilization of Freshwater Fish Resources

Some of inland open waters seems to have been ruined because of shortage of water volume mainly caused by heavy deforestation in the upper stream basin. The situation is the most serious in Batang Hari river basin where hundreds of oxbow lakes connected with main river through the deepened canal. The fish productivity in these inland waters may have been gradually declining year by year. It is necessary to control water level and quality, and to take measures for increment of fish stock, in order to ensure constant supply of freshwater fish to local people. In order to promote fish stocking programme and aquaculture, however, appropriate system for production and supply of fish fry should be urgently established. In addition, water supply system should be improved so as to supply enough volume of water throughout the year.

1) Inland Fishery Development

- a) Rehabilitation of the Freshwater Aquaculture Research Center, Palembang (as a part of Swampland Technology Institute concept proposed as an institutional support project, K-3)

- b) Rehabilitation of the existing water bodies such as oxbow lakes, swamps and ponds, by means of civil work, with strengthening of fish stocking programme and water control so as to increase fish stock level
 - c) Establishment of inland fisheries stations for demonstration, research and extension services
- 2) Aquaculture Development
- a) Diversification of culture species with development of hatchery technique, e.g., freshwater giant prawn, sand gobi, Pangasius
 - b) Establishment of a stable water supply system to the culture ponds

(4) Strengthening of KUD to Organize Processing and Marketing

As mentioned in the Progress Report I (August 1991, JICA) of the Study, the number of private fish landing bases (so-called "tangkahan" or "toke") is very limited compared with the northern part of Sumatra, and thus most of fishermen and fish farmers are small-scale but not operated under particular ownerships. In the course of promotion of fish marketing and processing, the roles of cooperatives (KUD) become more important, particularly in remote areas. The common problems that the Region has include fish marketing difficulty with low price. This is mainly caused by lack of transportation and marketing skills. It is expected to develop fish processing methods to diversify market accessibility through strengthening of cooperatives.

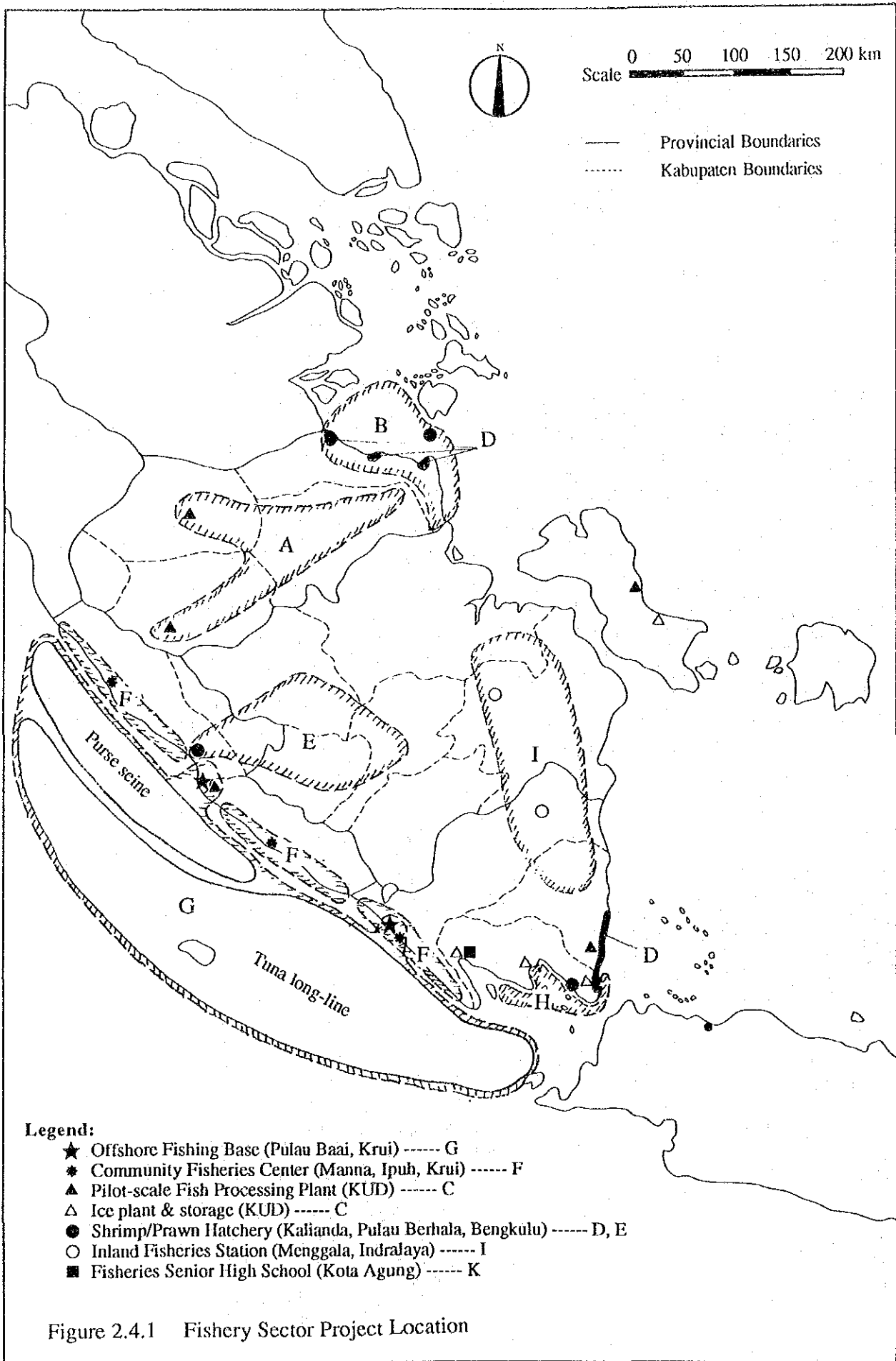
Some fishing villages in the Region seem to be left behind because of sparse population. Their fishing boats and gear are still traditional and catch level is still primitive. For example, even the fishing town of Manna (Bengkulu Selatan), which is facing to sea having rich fish resources, imports fishes from Padang, Sibolga, etc. In such fishing villages, it is necessary to take some measures for raising fishermen/fish farmers' working intention.

- 1) Development of fish processing and diversification of markets
 - a) Establishment of pilot-scale fish processing units
 - b) Sales promotion of processed fish as a special product in the Region
- 2) Improvement of Fishing Village Environment
 - a) Establishment of community fisheries centers; consisting of small ice plant/storage, workshop, fish market/auction hall, training/meeting room, cooperative office, fishing gear storage, fuel and water station
 - b) Coast line protection from sea erosion

2.4 IDENTIFIED PROJECTS

- A. Batang Hari River Basin Fisheries Development Project (Batang Hari)
 - 1) Batang Hari River Basin Stock Assessment
 - 2) Oxbow Lake Fisheries Development
- B. Coastal Fisheries Management Project (Tanjung Jabung, Musi Banyuasin)
 - 1) Coastal Fishery Resources Inventory Management and Enhancement
 - 2) Artificial Reef Development
 - 3) Aquaculture Demonstration
- C. KUD-Based Fish Processing and Marketing Promotion Project (Lampung Tengah/Selatan, Kdy. Bengkulu)
 - 1) Pilot-Scale Fish processing Unit
 - 2) KUD-Based Fish Marketing Promotion

- D. Brackishwater Shrimp Culture Industrialization Project (Lampung Tengah/Selatan, Tanjung Jabung)
- E. Freshwater Giant Prawn Culture Development Project (Musi Rawas, Lahat, O.K.U)
 - 1) Freshwater Giant Prawn Culture Farm
 - 2) Freshwater Giant Prawn Hatchery
- F. Fishing Village Community Development Project (Bengkulu, Lampung Barat)
 - 1) Fishing Boat Motorization
 - 2) Fishing Village Community Development
- G. Offshore Fisheries Development Project in Western Waters (Pulau Baai, Krui, Kota Agung)
 - 1) Purse Seine Fisheries Development
 - 2) Krui Fishing Landing Center (PPI)
 - 3) Small-Scale Tuna Fisheries Development
 - 4) Fish Aggregating Device (FAD)
- H. Mariculture Development Project (Lampung Selatan)
- I. Swamp Fishery Development Project (Lampung Utara, Musi Banyuasin, O.K.I)
- J. Freshwater Aquaculture Infrastructure Improvement Project (Jambi, South Sumatra, Jambi)
 - 1) Freshwater Fish Hatchery Technical Development
 - 2) Aquaculture Water Supply Stabilization
- K. Fisheries Education and Training Project (All provinces in the Region)
 - 1) Fisheries High School (SPP Perikanan) in Kota Agung (Lampung)
 - 2) Upgrading of KUD's Management Capability



3. INDUSTRY

3.1 CURRENT CONDITIONS

The current conditions or potentials/constraints of industry in Southern Sumatra are as follows.

(1) Leading Industrial Products

Table 3.1.1 shows the subsector-wise number, employees, output, value added of large and medium enterprises in Southern Sumatra in 1988. Rubber (code no. 35), food (code no. 31) and wood and wood products (code no. 33) are the "Big three" leading industries in the Region, not only in number of enterprises and employees, but also in total output and value added.

Table 3.1.1 Subsector-wise Number, Employees, Output, Value Added of Large and Medium Enterprises in Southern Sumatra (1988)

Industry Code	No. of Enterprises	No. of Employees	(unit: number, Rp. million, %)		
			Total Output (A)	Total Value Added (B)	B/A
Total	583	92,094	2,766,932	699,254	25.3
31	178	23,266	976,647	189,635	19.4
32	13	1,970	11,393	3,018	26.5
33	210	30,414	596,368	198,514	33.3
34	6	182	697	390	57.4
35	79	27,433	1,083,792	269,449	24.9
36	69	6,523	67,717	24,517	36.2
37/39	28	2,306	30,236	13,731	45.4

Source: Statistical Yearbook of four provinces

Note: Industry code 31=Food and beverage; 32=Textile and apparel; 33=Wood and wood products; 34=Paper and paper products; 35=Chemicals (include Rubber); 36=Non-metallic mineral products; 37=Metals; 38=Metal products; 39=Others

One point to be given attention is the fact that average value added ratio on output in Southern Sumatra is relatively low compared with that of total Indonesia. Average value-added ratio of Indonesian industry is 33.6%, while the figure of the Region is 25.3%, some 8 point lower than the national. The tendency is conspicuous in food industry. As national average value-added ratio on output in the subsector is 34.1%, the Region is some 15 point under than the national. It was brought about by the fact that such low processed products like coffee, pepper, palm oil, cassava and cocoa are the dominant products of the Region.

(2) Export

Total non-oil/gas export value from Southern Sumatra in 1988 was US\$ 1,451 million sharing 12.6% of gross export of Indonesia (US\$ 11,537 million) and about 70% of gross output of the Region. Table 3.1.2 shows the top ten commodity items in value exported from Southern Sumatra in 1988, which share more than 97% of total export of the Region. Most of export from the Region are resource based products, generally have low process degree except but plywood and fertilizer and have relatively low value added.

Table 3.1.2 Export Value by Commodity from Southern Sumatra in 1988

Commodity	(unit: US\$ million, %)	
	Export Value (FOB)	Composition (%)
Grand Total	1,451	100.0
Rubber (SIR,RSS)	343	23.6
Coffee Robusta	323	22.2
Plywood	189	13.0
Tin (Unwrought)	184	12.7
Pepper (White, Black)	140	9.6
Woods (Sawn, Molding)	139	9.6
Manioc/ Cassava	51	3.5
Urea Fertilizer	15	1.0
Canned Pineapple	14	1.0
Prawns/ Shrimps, Frozen	14	1.0
(Sub Total)	1,412	97.2
Others	39	2.8

Source: BPS, Indonesia Foreign Trade Statistics (Exports) 1988

Table 3.1.3 shows the top ten countries of destination in value from Southern Sumatra in 1988 with the comparison of their composition with that of total Indonesia. United States, Singapore and Japan are big three countries of destination. United States, importing such natural resource based products as crumb rubber, pepper and coffee, comes first sharing more than 1/4 of the Region's total export value. Singapore comes second, importing unwrought tin, crumb rubber, wood products and plywood, sharing 1/5 of the total. Singapore is not consuming all of the import but reexporting most of them to the third countries. Such products as crumb rubber, wood products and plywood are exported from Jambi and South Sumatra on small ships or barge and transhipped at Singapore to ocean container liners. Japan which shares more than 40% in total export from the country shares only 10% of export from the Region. The reason why Germany and Netherlands have relatively higher share is they are importing such natural resource based products as cassava, coffee and tin.

Table 3.1.3 Export Value by Country of Destination from Southern Sumatra in 1988

Country of Destination	(unit: US\$ million, %)		
	Export Value (FOB)	Composition in Southern Sumatra	Composition in Total Indonesia
Grand Total	1,451	100.0	100.0
United States	367	25.3	16.0
Singapore	300	20.7	8.6
Japan	158	10.9	41.7
Germany	88	6.1	2.4
Netherlands	86	5.9	3.4
China	48	3.3	2.6
South Korea	39	2.7	4.4
England	28	1.9	1.8
Taiwan	25	1.7	2.5
Hong Kong	15	1.1	2.9
Others	297	20.4	13.7

Source: Indonesia Foreign Trade Statistics (Export) 1988

(3) Investment

Table 3.1.4 shows accumulated domestic investment number and amount in Rp. billion from 1968 up to 1989 and accumulated foreign investment number and amount in US\$ million from 1967 up to 1989. More than 60% of both domestic and foreign investment have concentrated in Java, especially in West Java in recent years. As for Southern Sumatra, domestic investment, sharing more than 6% of total Indonesia, is fairly proportional to its population. Foreign investment, however, is sharing less than 2%, very poor both in number of projects and their investment amount. Among 44 foreign investment in Southern Sumatra as of end 1990, more than 80% is judged to be resource-oriented. So, it may be said that natural resources attracted foreign investment.

Table 3.1.4 Region-wise Accumulated Investment as of End 1989

(unit: number, Rp. billion, US\$ million, %)

Region	Domestic		Foreign	
	Project(%)	Amount(%)	Project(%)	Amount (%)
Indonesia	6,097 (100.0)	78,409 (100.0)	1,290 (100.0)	27,573 (100.0)
S.Sumatra	377 (6.2)	5,406 (6.9)	22 (1.7)	541 (2.0)
N.Sumatra	635 (10.4)	10,022 (12.8)	99 (7.7)	5,358 (19.4)
West Java	2,651 (43.5)	36,876 (47.0)	875 (67.8)	13,947 (50.6)
Other Java	1,312 (21.5)	12,960 (16.6)	149 (11.6)	3,726 (13.5)
Others	1,122 (18.4)	13,144 (16.7)	145 (11.2)	4,002 (14.5)

Source: BKPM

Note: Accumulated domestic investment amount (1968-1989) in Rp. billion; Accumulated foreign investment amount (1967-1989) in US\$ million

(4) Labour

Enterprises in Southern Sumatra absorb 158 employees in average. Compared with national average 130, enterprises in the Region can be said more labour intensive or they tend to use abundant cheap labour force. Average annual labour cost of the Region in 1988 was 2,092 thousand rupiah. According to the survey by the Ministry of Labour, annual payment for labour in industry field ranges from 1,388 thousand to 22,274 thousand rupiah. The level of payments for employees in the Region stays very near to the bottom of the national range. The cheapness of labour cost can be said to be one of the advantages of the Region.

Table 3.1.5 shows number of pupils and students in primary, junior or senior technical high schools and universities in Southern Sumatra. The table shows how many percent of pupils who graduate primary school have possibility of going to such higher level of technical educations. When compared with national level, the figures of the Region, especially those of senior technical high schools -- main source of skilled labour -- is relatively low.

Table 3.1.5 Number of Pupils/Students in Primary, Junior/Senior Technical High Schools and Universities

(unit: number, %)

Region	Primary S (6 Years)	Jr.Tech.H.S. (3 Years)	Sr.Tech.H.S. (3 Years)	University (4 Years)
Indonesia	26,725,364	84,678(0.64)	399,935(3.00)	852,612(4.79)
S.Sumatra	2,856,000	4,322(0.15)	24,142(0.85)	34,04(1.19)

Source: BPS, Statistical Year Book of Indonesia, 1989

Note: Figures in parenthesis show index when graduates from primary schools is set 100, how many the graduates from higher schools are.

(5) Land Price

Foreign investors have no right to get land, but land price is one of key factors for domestic investors to select their factory location. The tentative land price of the Lampung Industrial Estate is Rp. 7,500 per sq. meter. As prevailing or offered land price of several private Industrial Estates developed in Bekasi, West Java is around US\$ 40 per sq. meter, there exist some 10 times difference between the two. Cheapness of land price can be one of the advantages of the Region.

(6) Geographical Advantages

Proximity to Java, the largest domestic market with about 60% of the nation's population and existence of Jakarta, the main port for export, enables shippers in the Region to spend less transportation cost than those in other area. Proximity to Singapore, one of the largest transit trade port in the world is another geographical advantages.

(7) Infrastructure

Location of industry is mostly concentrated in urban area with some exception in highly industrialized countries where super highways or air transportation are available. The main causes of the concentration are:

- 1) availability of infrastructure like road, railway, seaport, airport, telecommunication, etc.;
- 2) availability of utilities like water, electricity, fuels, etc.; and
- 3) availability of labour.

Generally speaking, development of infrastructure is insufficient in Southern Sumatra. It is difficult to develop such infrastructure all over the Region, but it may be possible if the development is made in limited area. If the most suitable location for industry is selected, development of infrastructure and utility made appropriately, there will surely come new investment.

(8) Technology

Necessity of technology level up are raised in the industrial development plans of every provinces. Actually, however, some advanced enterprises in leading subsectors are aware of the necessity through daily severe competition and buyers' request. They have not only diversified their products but also made technology innovation for producing better quality of products. For that purpose, they have introduced advanced machine and equipment from advanced industrial countries like United States, Japan, EC and Taiwan. Most frequently observed machine and equipment in Southern Sumatra were those from Taiwan. Technicians who comes to Indonesia for installation and start up for about 3 to 6 months, usually make technology transfer. If some pilot plants of such modern technologies was introduced and operated by such official R & D organization like Institute for Research and Development of Industry in Palembang, they will assist for technology level up of not so much aggressive and advanced enterprises in the Region.

(9) Marketing

Necessity of marketing, especially market information, are also raised commonly. Enterprises in Southern Sumatra have little market knowledge about what quality of products the users and consumers want, to what direction the needs or taste of them moves and how much they can afford to pay. At present, the enterprises get such information mainly from the buyers, partly through BPEN (Badan Pengembangan Ekspor Nasional) and KADIN (Kamar Dagang dan Industri). If some organization who make survey on above mentioned matters and offers such information, enterprises in the Region could improve or diversify their products in line with users' or consumers' needs.

3.2 DEVELOPMENT CONCEPT 2010

(1) Stages of Industrial Development

Generally speaking, stages of industrial development start with "unprocessed primary goods (= natural resources)". Firstly comes "primary processing," then "secondary processing," and finally "assembling." For example, in case of furniture manufacturing, "unprocessed primary goods" is logs, "primary processed" is sawn wood, "secondary processed" are plywood or carvings and "assembling" is the furniture manufacturing. One variation of "assembling" is "consign-based processing" which is observed mostly in garments and embroidery business.

In Southern Sumatra, labour absorptive types of industry are needed. For the fulfillment of the needs, following types of industry are recommendable:

- 1) Labour intensive types of industry like agro-processing, wood processing, garments and assembling rather than capital intensive types of industry like basic chemicals, synthetic fibers and cement;
- 2) (In case of capital intensive types), such related or linked business as maintenance, security, packaging materials supply, packing, transportation and utilization of byproducts or waste; and
- 3) Such types of industry which use middle advanced, semi-hand-operated machine and equipment adopted in Taiwan or South Korea, rather than automatic and rationalized new and powerful machine and equipment which requires small number of labour force.

Here, the Team's view on labour absorptive power is shown below. According to Statistical Yearbook of Indonesia, 1989, total number of persons engaged in large and medium scale enterprises in the Region in 1988 was 72,800, while that of small and cottage enterprises in the same year was 154,674, showing more than double of labour absorption. However, when per enterprise employees is calculated, the latter employed only 2.3 person, while the former employed 161.1, some 70 times more labour absorptive than the latter. In other words, in order to absorb same number of employees as that of one large or medium scale enterprise, 70 small and cottage scale enterprises needed to be established. Or, invitation of one large or medium scale enterprise has equal effect of establishing 70 small scale enterprises in sense of labour absorption. Moreover, the large and medium scale enterprise will usually lead a group of such related or linked small scale enterprises, while the reverse will scarcely happen. The Team therefore stress the development of large and medium-scale enterprises, but nonetheless do not intend to neglect the effort of promoting small and cottage scale enterprises.

(2) Development Concept 2010

Development concept 2010 in industry field for Southern Sumatra are:

- 1) Resource oriented, secondary processing industry should be selected as main frame of industrial development in the Region, especially agro based, secondary processing industry to take advantage of such potentials described in section 3.1 above. This selection also fits with one of the tar gets of industrial development during Repelita V of the nation --- "expansion of the food crop processing industry to further optimize utilization of the basic assets of the agriculture sector and other sectors, to increase value added, and to strengthen the economic structure."
- 2) Development of export substituting industries. Recently, the mainstream of

investment in industry field in Java by both domestic and foreign investors is for labour intensive assembling industries like automotive, home appliances and garments. On the other side, the direction of industrial development in the Region should be headed for export substituting industries which aim to process more on natural resources being produced abundantly and exported in low process degree and to add more value on them.

- 3) Participation of private sector. To develop industry in the Region, it requires not only time but also funds and technologies. In order to accelerate the development speed, it is inevitable to attract investors from both domestic and foreign who have capital and technologies, and moreover market.
- 4) Back support by public sector is required. Development of infrastructure, human resource development, enlightenment of such basic industrial common sense as industrial standards and quality control --- these three are fundamentals of development of industry which public sector ought to provide.
- 5) Expected effect is the contribution 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, land conversion to industrial land and even to the extent of demand increase of such capital goods as farm machines and implements. As a result, this will increase the gross consumption of the Region through increase of the gross income of the people who engage in agriculture, forestry, fisheries and mining.

Living example of this concept is the agro-processing industry of Thailand which is well known as "Green Revolution." Other examples can be seen in agro-processing and wood processing industries in the Philippines or the same with processing machineries and technologies in Taiwan. Some enterprises in private sector in the Region have already gave attention to these good examples. For instance, a new sugar plantation in Lampung Utara has invited Philippine experts for technology transfer and a Jambi Palm oil refinery has introduced their plant from Taiwan.

(3) Development Prospect

Figure 3.2.1 shows the development prospect of industry sector contrasting the 1990 and the 2010 situation in gross output base. The figure was processed on two base data, namely "Annual survey of large and medium manufacturing establishments (1989)" and "Number of establishments and number of employees by 3 digit ISIC and by province (1989)," both provided by BPS. These base data figures were multiplied by 1.22, considering the share for small and cottage scale enterprises. In Industry Census of 1986, the latest figure available, the share of small and cottage scale enterprises in national gross output was 18.0% ($18.0\%/82.0\%=0.22$).

Projection was made using average GDP growth rate of manufacturing sub sector of each province. The Team estimated 10% higher growth rate than average provincial growth rate for seven "core" kabupatens/kotamadyas which are thought, at present, to be more established above regional average position in either number, employees and output of manufacturing establishments, considering the advantageous factors they have. Note that oil and gas related projects were excluded from the calculation because they belong to national projects and this Study uses GDP without oil and gas as the basic economic indicator.

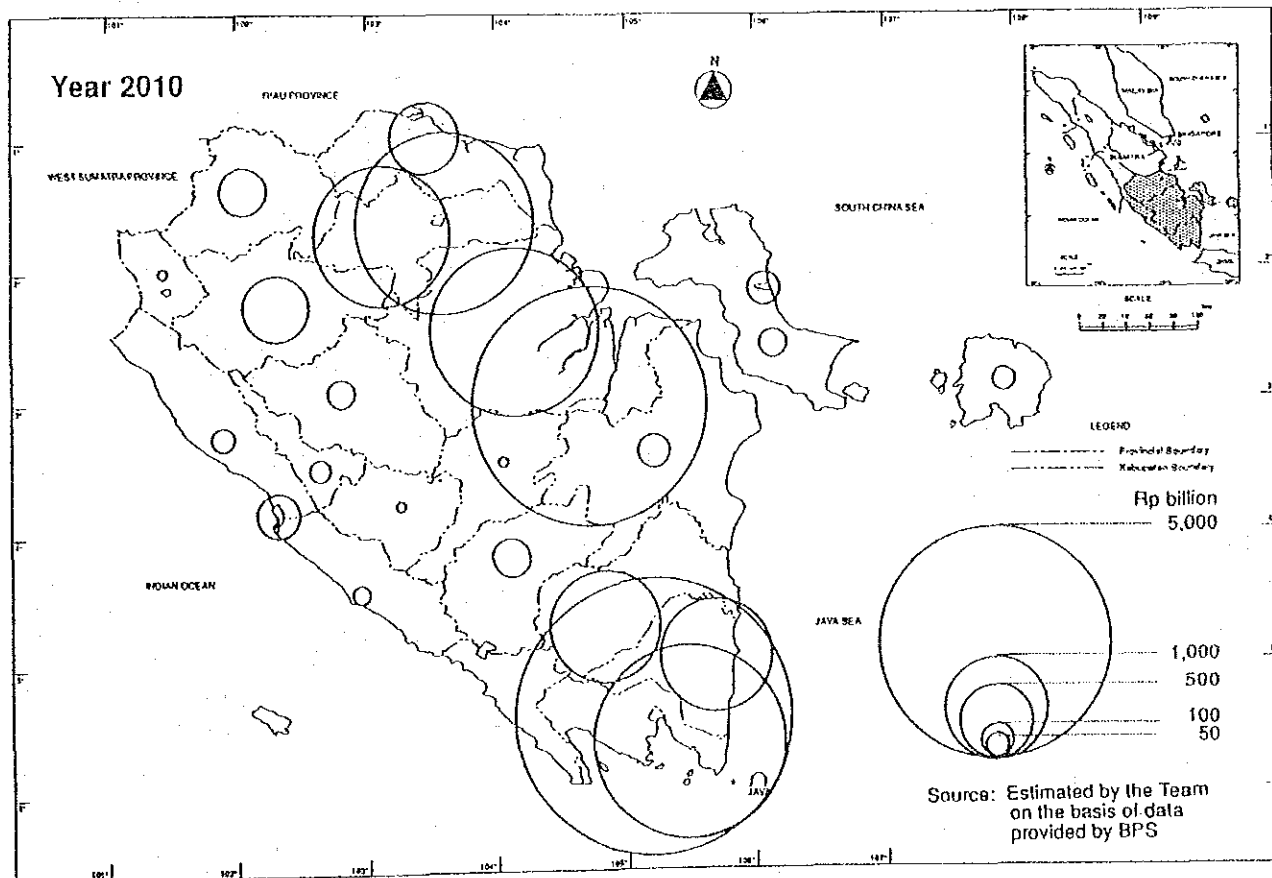
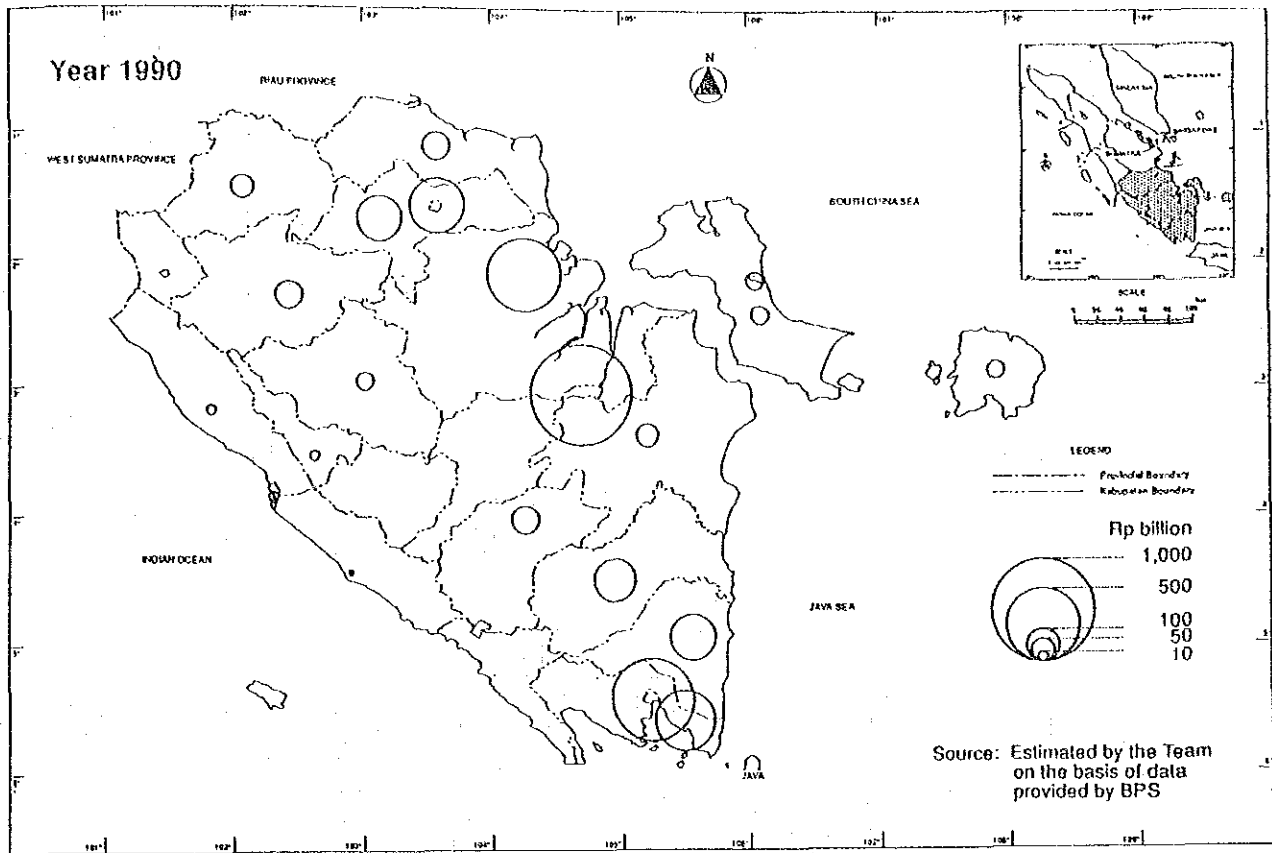


Figure 3.2.1 Development Prospect (Industry)

3.3 ISSUES AND STRATEGY

3.3.1 Issues

Major issues to be tackled to achieve the 2010 vision are:

- 1) Industrial centers or cores, where industry should be located in each province of the Region, are not clearly identified;
- 2) Actual situation of product forms (in what forms or processing degree are the products shipped) are not so clear;
- 3) No estimation data or information available for private sector on how much resources in the Region are conserved for processing;
- 4) Ways of improving processing degree to achieve higher value added are not clear;
- 5) Present condition of infrastructure in the Region is not attractive for potential investors;
- 6) Insufficient back support by public sector in the field of technology development;
- 7) Quality of labour is in not so high level;
- 8) Provision of market information is insufficient;
- 9) Inadequate related system such as industrial standard (IIS), quality control and institutional finance;
- 10) Scarce mutual linkage activities between area, industry sub-sectors and large/medium and small enterprises;
- 11) Not so aggressive investment promotion activities; and
- 12) No agency who coordinate above activities.

3.3.2 Strategy

Strategy to be taken by public sector in order to attain the 2010 vision are listed below. All of them need much time-consuming development procedure.

(1) Identification of industrial centers or cores which are suitable for locating industry

Each establishment has its motive of locating---resources, population (=labour force), infrastructure, transportation, etc. Here, candidate kabupatens/kotamadyas for future development cores were selected on the basis of following criteria:

- 1) existing number of establishments, employees, gross output of large and medium scale enterprises of each kabupaten/kotamadya;
- 2) future growth rate of industrial sub-sector;
- 3) distribution of population as base figures for labour source; and
- 4) supply of electricity (representing utilities).

Seven kabupatens/kotamadyas namely Batang Hari, Jambi, Musi Banyuasin, Palembang, Lampung Selatan, Lampung Tenga and Bandar Lampung can be thought to be qualified for industrial centers or cores. Tanjung Jabung and Lampung Utara have some possibility, if provincial or central government make every endeavor for development. Even in core kabupatens/kotamadyas, it is necessary, as next step, to make more detailed investigation on their location by kecamatan/kelurahan level and select their "core of the cores." This is so because principally the industrial core means some point rather than some area when shown on the map, especially in case of agro-processing.

(2) Survey of present situation on what kind of natural resources are shipped after what type and degree of processing

At present, export statistics is the most detailed data which shows the status of products and their quantity and value by province. Survey on what part of processing

Southern Sumatra lack or to what extent Southern Sumatra can expand its business or add more value should be done to get present situation of products status, as opportunity permits, with cooperation of KADIN and industrial associations. In case of petrochemicals, it has the "industrial tree" or flow chat which shows present condition of the industry, so we can easily find in what part the industry has the room for diversify.

(3) Investigation of potential natural resources

As "Resource oriented processing industry" will be the main frame of industrial development, it is the basic and essential step to implement the investigation of how much resources are existing in the Region.

Targets for this investigation are forest (wood) resources, fishery resources and mineral resources. In case of forestry, there is no published information on how much amount of forest resources will be available for wood processors, although Ministry of Forestry is said to have related data. Moreover, there exist conservation area. Wood processors in Jambi seek for information on the prospect of raw wood supply. They are now importing raw material wood from Kalimantan in addition to resources from their province. In case of fishery, sampling fishing of sea water fish resources is necessary tying up with such countries like Japan, South Korea and Taiwan to grasp basic situation on type of fish, shellfish and sea weed. Some Taiwanese capital is said now investigating on fish resources in Indian Ocean and if they got good results, they will locate in Bengkulu their base port with freezing and canning facilities. In case of minerals, it is said that the Region is blessed with many kinds of mineral resources besides coal. However, no concrete data concerning the location and contents are published.

The result of investigation should be supplied as basic information for potential investors who are planning to process these raw materials. At present, most of enterprises from private sector locate their processing factories after their own investigations. For example, one rattan furniture manufacturer in Bengkulu made pre-investment study for rattan resources before he decided to locate his factory there. Also, one canning factory there has grasped the availability of their raw materials--bamboo shoot and "escargot" (snails used for French cuisine).

(4) Investigation on concrete ways to improve processing degree and to add more value on resources

The shortest way for this strategy is to form a study group consisting of experts from Provincial Office of Industry and Provincial Planning Board of each province and Institute for Research & Development of Industry of Palembang and Bandar Lampung, etc. with participants from private sector and to dispatch to such countries as Taiwan, Thailand and the Philippines to see actual situation of their secondary processing practice and to get information related on:

- ways of processing,
- processing technologies,
- machine and equipment,
- necessary investment cost, and
- estimated additional value added.

Private sector will easily be able to decide what they need and to negotiate with process owner or machine and equipment suppliers. For example, the Chamber of Furniture Industries of the Philippines (CFIP), after sending missions to northern European countries where the furniture manufacturing technology level is high, succeeded to get a very many data and information, which contributed to the level up of the association members.

(5) Development or improvement of infrastructure including Industrial Estate (I.Es.)

In order to up-grading resource oriented, secondary processing industry in the Region, introduction of direct foreign investment and invitation of export oriented domestic enterprises are inevitable. In both cases, investors need place for production. Main target of developing I.E. 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 investor, and, as a result, to promote investment from both domestic and abroad. Subsidiary aim of developing I.E. is area 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.

Investors, especially those from foreign countries, select their factory location through internationally comparison by applying such criteria as follows:

- 1) Geographical location--access to raw materials source, products' market and related government agencies like BKPM, custom and labour office, etc.;
- 2) Distance from sea/air port and access road condition (width, pavement and traffic volume);
- 3) Availability of utilities (volume and stability);
- 4) Availability of communication facilities;
- 5) Availability of labour (quantity and quality or skill);
- 6) Development policy of local government; and
- 7) Incentives.

Some foreign investors raise such points as their criteria as living conditions for managements and availability of middle class managers or middle class engineers.

One thing to be taken attention is the developed I.E. is to be attractive for potential investors with appropriate location, proper price, good administration and management considering locators' needs and convenience first. After the proclamation of the Keppres No. 53 in October 1989, a lot of I.Es. are under construction by private sector in JABOTABEK area in West Java. While, in seven I.Es. including Lampung I.E. already developed by Indonesian Government, the occupancy rate remains comparatively low except but Pulogadung I.E. in Jakarta and Rangukut I.E. in Surabaya. Many factors are pointed out as the cause of underutilization of these I.Es. The principal cause is the fact that these I.Es. have been developed not only on needs by potential investors but on Government's policy for regional development.

Concerning Lampung I.E., it is promising with good location--14 km distance from Panjang port, 20 km from Bandar Lampung, established master plan for four staged development, prepared infrastructure and utilities. Moreover, the operation and management of the I.E. are to be implemented by tripartite organization called "BPSKAIL," consisting of central government, provincial government and private sector. One constraint for this I.E. is scarcity of locators. It has only three investors contracted with total occupancy area of 6 ha as of July, 1991. What is needed for Lampung I.E. is promotion activity for inviting potential investors. Target countries for invitation 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 organization 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.

In accordance with Government Ordinance No. 14 of May, 1990 some of I.Es. are to be approved as "bonded zone," which makes a motivation for export-oriented enterprises to advance. So, it is recommended for Lampung I.E. to get the approval for bonded zone. Another point necessary for Lampung I.E. is improvement of container loading and unloading

capacity of Panjang port.

Investigation for I.E. development is under way in the outskirts of Palembang. However, 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, the master plan of development of the I.E. will be formed after feasibility study done by some consultants. After establishment of such master plan, the announcement for inviting developers from private sector will be made.

(6) Upgrading of Institute for Research & Development of Industry

At present, there are 9 central research laboratories, 12 regional institutes for industry under Agency for Industrial Research & Industry of Ministry of Industry which support mainly small and cottage enterprises as part of BIPIK (Bimbingan dan Pengembangan Industri Kecil) program. There are two regional Institutes of Industry, one in Palembang and the other in Bandar Lampung. The latter was just established in the summer, 1991. The former is expected to cover all four provinces as its service area, but actually its activities are limited only within South Sumatra province because of the budget for physical movement. According to a publication provided by Ministry of Industry, there are 297 small scale industry centrals in total in the Region as shown in Table 3.3.1.

Table 3.3.1 Small Scale Industry Centrals

(unit: number)					
Sub-sector	Jambi	S.Sumatra	Bengkulu	Lampung	Total
Food	15	25	17	25	82
Leather/Closing	6	14	10	22	52
Construction					
Materials	9	30	14	14	67
Handicraft	14	26	6	8	54
Metal	3	22	9	8	42
Total	47	117	56	77	297

Source: Ministry of Industry, Lokasi Industri Dasar/Kunci Yang Dapat Menumbuhkan Zona Industri di Wilayah-Wilayah Pusat Pertumbuhan Industri Posisi, Bulan Juni 1988

In order to realize above potentials, the contribution of these institutes will become more and more important. Capability of these institutes, especially that of Palembang, are expected to be strengthened through modernization and upgrading of the laboratory equipment, renovation of laboratory buildings and training of staff. This suggestion forms a part of project titled "Upgrading of Industrial Research and Development Facilities (Code No. D-85)" in 1991/92 Blue Book. Functions to be added for the institutes includes:

- introduction of technologies development in the neighboring countries like Taiwan,
- engineering including pilot plant operation,
- rendering technology training for trainees from private sector,
- provision of technical extension services covering whole the Region,
- accept complaints and suggestions from local consumers for products, and
- testing, chemical analysis, quality control and calibration.

Managerial aspects like book-keeping, stock control and marketing are also requested by small and cottage scale enterprises.

(7) Improvement of technology and vocational training centers

Special attention should be given to human resource development and better utilization of it for absorbing new employment for the Region. There are 60 technical high schools in the Region with 24,142 students in 1989/90 school year. They have courses of architecture, electricity, electronics, process technology, and power machineries. However, they have no agro-processing course except but process technology. Besides there are five training centers (BLK--Balai Latihan Kerja) and 13 training courses (KLIK--Kursus Latihan Kerja). Other opportunities for technology and vocational training are provided by large enterprises accepting trainees from small scale enterprises. It is recommended that the curricula for these training should include education of English, the most universal communication tool, and of quality control. In JABOTABEK area, needs for middle class managers and engineers become stronger among investors located there. In order to meet the regional needs for industrial manpower, there should be manpower planning and budgeting at the regional level, with a breakdown in the four provinces. Preparatory work for education takes much time because you have to teach the trainer first. So, it is recommended to start this strategy as soon as possible.

(8) Establishment of Market Information Center in cooperation with BPEN and KADIN

KADIN has actually this function at present but passive one. It merely transfer inquiries from abroad to related associations although they have their own networks. What is proposed here is more active function as follows:

- assistance for export promotion by means of supplying necessary information for export market development,
- introduction of inquiries from potential buyers (getting information from trading companies and Chamber of Commerce and Industry of target market countries),
- assisting in designing of products and their packaging, and--advising packing know-how including containerization.

Living examples of this center are JETRO, KOTRA and CETRA. Main function of JETRO, the originator of this type organization, are:

- 1) Overseas marketing research to grasp actual and up-to-date situation of export market through investigating general trend of major markets and trade condition of specific goods or buyers in some limited market;
- 2) Providing foreign market information for exporters, introduction of inquiries from buyers, rendering overseas marketing research service and consultation service on foreign trade practice mainly for medium and small scale enterprises; and
- 3) Export market development through promotion of international trade fairs and campaign activities for foreign markets.

(9) Improvement of related systems such as Indonesia Industrial Standard (IIS) and institutional financing

To be competitive in world or even in domestic market, quality unification of products is inevitable. Large and medium scale enterprises who are engaged in export of their products are well aware of the importance through the specifications given from their buyers. Enlightenment activities on quality consciousness for mainly medium and small scale enterprises and for raw materials suppliers like raw rubber for crumb rubber are recommended. There are 2,246 IIS as of Dec. 1988, comparatively few in number, compared with about 8,000 in Japan and about 6,000 in South Korea. Although quality check is required before shipment in case of such primary goods like crumb rubber, IIS should be extended to cover secondary processed products.

In accordance with the policy package for bank financing announced in January 1990, preferential interest rate of 6 to 12% per annum, adopted originally for small investment credit (KIK--Kredit Investasi Kecil) and permanent working capital credit (KMKP--Kredit Modal Kerja Permanen) were limited to four sub-sectors in agricultural production and plantation business. Even small scale enterprises, now, have to pay general interest. This spoiled the entrepreneurship of small scale enterprises' owners. Some countermeasures are anticipated.

(10) Promotion on establishing linkages

There are three concept in linkages---areal, inter-industrial and within industry (that is, between large/medium scale enterprises and small scale enterprises).

As this study focused on regional development, areal linkage has some importance. Three dimensions can be presented:

- 1) Linkage with West Java/Jakarta as the largest domestic market and supply source of trained labour;
- 2) Linkage with Northern Sumatra as counterpart of exchange each other such raw materials as unprocessed rubber and palm oil; and
- 3) Linkage within four provinces in Southern Sumatra in such activities like secondary processing based on primary products produced in separate provinces. For example,
 - particle board production using wood from Jambi and urea or melamine adhesives from Sough Sumatra, utilizing small scale natural gas as energy source for drying, and
 - wood wool cement board production using wood wool, which is by-product for Jambi wood processors, and cement from Semen Baturaja.

In inter-industry linkage industry accepts mainly from other industries, but supply its products to others:

- 1) Agriculture---estate products, mixed crops and cattle
- 2) Fisheries-----fishes, shellfishes and sea weeds
- 3) Forestry-----woods
- 4) Mining-----non-ferrous metals, metals and non-metals
- 5) Tourism----- (supply)handicrafts for souvenirs
- 6) Other tertiary sector---trade and transportation activities

In highly industrialized countries, within industry linkage is prospering, forming a pyramidal structure. Small scale enterprises supply parts to medium scale enterprises where they produce modules and supply them to large scale enterprises. In the Region, where the stage of industry is immature, first step to form this type of linkage should be started with:

- 1) Supplying raw materials and packaging materials,
- 2) Utilization of by-products or wastes, and
- 3) Supply service activities like transportation, maintenance, security, measurement and designing, etc.

(11) Investment promotion activities

Necessity of this kind of activities have already mentioned in (5) above. Followings are the procedure for inviting domestic enterprises, especially export-oriented one, to the Region to be implemented by BKPMs:

- 1) Identification of the investors to be attracted to the Region--Main core will

consist of investors who undertake production of resource oriented primary 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;

- 2) Collaboration with various manufacturers' associations--Through collaboration with the various manufacturers' associations under KADIN, efforts have to be made for attracting their member firms;
- 3) Provision of basic information which is useful for private investors such as resource reservation, infrastructure conditions, regional incentives, etc. in the information center; and
- 4) Seminars and consultation.

(12) Organizing public agency which coordinates and promotes above activities

Strengthening of BKPM of each province may be the shortest way. However, a banded or integrated operation of BKPMs of four provinces is suggested for more powerful drive for industrial development of the Region. Besides, closer cooperation with such organizations as consultants (IKINDO), engineers (PII), economist (ISEI), contractors (GAPINDO), etc. in business sector is necessary. Their full participation, both at planning stage and in implementation stage, is very important.

3.4 FORMULATING PROJECTS

The most of strategy which were taken up in Section 3.3.2 above are listed as projects for public sector in the long list in Part 4 of Vol. 4. However, item (1) above was deleted to avoid repetition with the main frame of the Study.

Guiding considerations adopted in formulating the recommended projects for private sector in the long list are:

- 1) Utilizing natural resources which are available in the Region and favorably utilizing currently discarded resources (for example, saw dust and old rubber tree);
- 2) Primary or secondary processing;
- 3) Earning more value added;
- 4) Labour absorptive;
- 5) Supplying to export market or improving the living standard of people;
- 6) Having experience in neighboring countries; and
- 7) Projects already listed in the publication by Ministry of Industry (Lokasi Industri Dasar/Kunci Yang Dapat Menumbuhkan Zona Industri di Wilayah-Wilayah Pusat Pertumbuhan Industri Posisi, Bulan Juni 1988).

4. MINING/ENERGY

4.1 NATIONAL POLICIES

(1) Mineral Development Policy

Natural resources are useful to promote the welfare and livelihood of the people. Mining activities can give chances of business and job opportunities to the people, supply various raw materials for industries, and contribute to raising the regional gross domestic products. Mineral development policy in Indonesia can be summarized as follows.

- 1) Value added, i.e., to promote mineral processing in order to gain value added products and to decrease import of the products.
- 2) Quality, i.e., to establish quality standard of mineral products in order to increase international competitiveness in the market.
- 3) Regional development, i.e., to promote regional activities and developments through exploration of useful mineral and mine development.
- 4) Jobs create, i.e., to create more employment.
- 5) Environment, i.e., to promote environmental awareness in mining industry.

(2) Energy Development Policy

The objectives of energy policy in Indonesia can be summarized as follows.

- 1) To secure the continuity of energy supply for domestic use at prices affordable to the public to enhance the quality of life of the people and to stimulate economic growth.
- 2) To save the adequate supply of oil and gas for export so that these can remain to be an important source of foreign exchange for funding the national development programs.

Energy development policy to meet the above objectives can be described as follows.

- 1) Intensification, i.e., to increase and expand the survey and exploration of energy sources available in the country.
- 2) Diversification, i.e., to reduce dependence on oil in the overall energy consumption by replacement it with other available sources in the country.
- 3) Conservation, i.e., to economize the energy use and to use it efficiently.

(3) Electric Power Development Policy

Electric power is one of the most important measures in meeting the energy development policy. Electric power development can promote economic activities and social welfare, in urban as well as rural areas. Rural electrification also can stimulate economic activities and can enhance the intellect and welfare of the people in the rural areas.

The electric power development policy in order to meet the above objectives can be described as follows.

- 1) Integrated development, i.e., to develop to be maintained in harmony and in synchronism at every stage on the national development, and to maximize the utilization of domestic products and services.
- 2) Rural electrification, i.e., to promote electrification in rural communities.
- 3) Diversification, i.e., to be in conformance with the national energy policy mentioned above, especially to lead diversification of energy source.
- 4) Environment, i.e., to comply with the Government's environment policy to conserve natural resources for sustainable development.

4.2 CURRENT CONDITIONS

4.2.1 Mining

(1) Distribution of Mineral and Energy Resources

The distribution of these resources is summarized in Table 4.2.1, Figure 4.2.1 and Figure 4.2.2. The evaluation of resources, needless to describe, is dependent on exploration activities and current technical levels. It certainly is possible that new resources are detected and opened up in the future. As shown in Table 4.2.1, in Jambi oil and gas, in South Sumatra oil, gas, coal and tin, in Bengkulu coal, gold and silver, and in Lampung province coal, gold and silver are produced. Non-metallic materials such as limestone, marble, andesite, granite, clay and quartz sand have been also quarried in small scale, however, these production is related to the domestic demand for urban area of each province for the present. In the Region, platinum, bauxite, mica or gemstones such as diamond, garnet and opal have not been detected.

Table 4.2.1 Distribution of Mineral Resources in the Southern Part of Sumatra

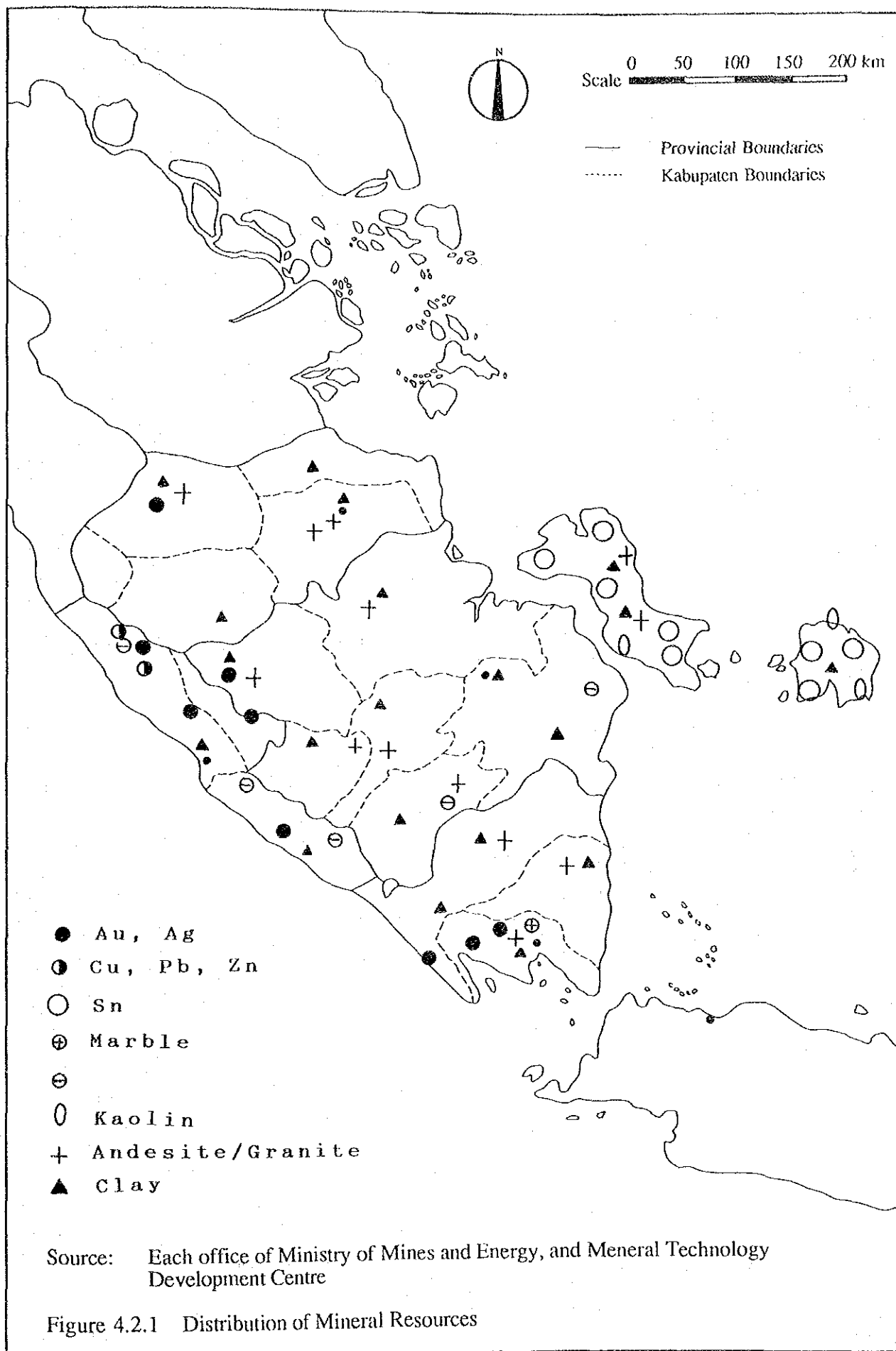
Resources	Jambi	S.Sumatra	Bengkulu	Lampung
1. Energy				
Oil	A	A	-	-
Gas	A	A	-	-
Coal	B	A	A	A
Geothermal heat	-	C	B	B
2. Metallic Mineral				
Gold	C	-	A	A
Silver	-	-	A	A
Copper	-	C	C	-
Tin	C	A	-	-
Zinc	-	B	C	-
Lead	-	C	C	-
3. Non-metallic Mineral				
1) Industrial Material				
Limestone	C	A	B	B
Dolomite	-	-	B	-
Phosphate	C	C	C	-
Calcite	-	B	C	-
Zeolite	-	B	-	A
Bentonite	C	B	C	A
Diatomite	C	-	-	C
Sulphur	-	-	B	B
2) Building Material				
Andesite	C	A	B	A
Trass	C	C	B	A
Marble	C	B	C	A
Granite	C	B	B	A
Pumice	-	B	B	A
3) Chemical Material				
Feldspar	C	-	-	A
Kaoline	C	A	B	A
Perlite	C	C	B	B
Quartz sand	-	A	C	A
Quartzite	C	-	-	B

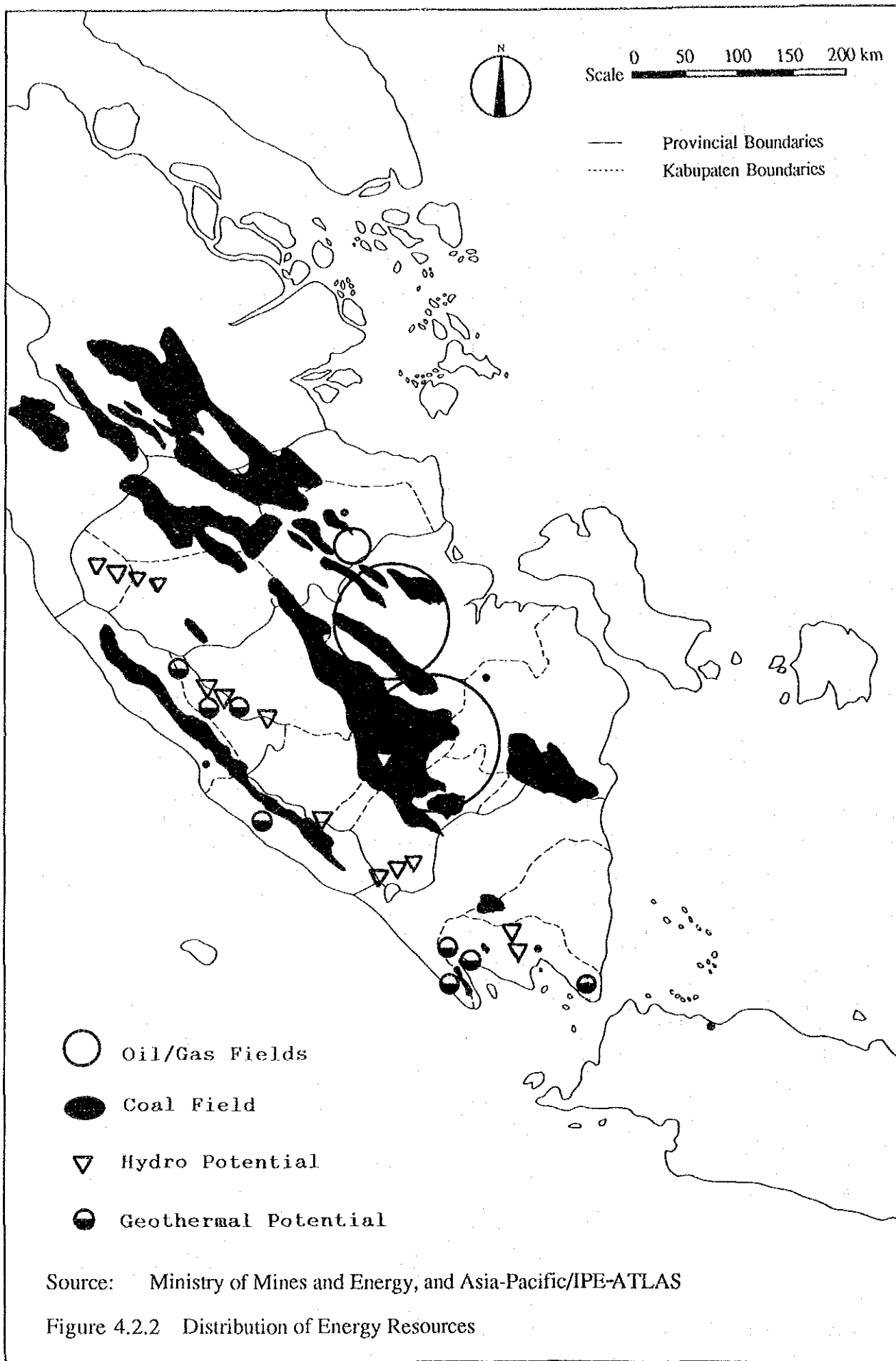
Source : Each branch office of ministry of mines and Energy

Notes : A; Denotes resources being mined

B; Denotes minable resources

C; Denotes potential resources





(2) Production of Mineral and Energy Resources

Past production trends of main minerals are shown in Table 4.2.2. Annual crude oil production including condensate in Indonesia has been progressed around 500 million barrels since 1982, after the production culminated to 615 million barrels in 1977. South Sumatra has maintained the share of about 6-7% in the national oil production. The operation in the Region is carried out by PERTAMINA (Unit II), PT. STANVAC, ASAMERA and TRITON (since 1990). Natural gas annually produced in Indonesia has steadily increased and reached 2,090 billion cubic feet in 1990. The share of the Region has accounted for average 7.3% of the national production. Coal production has rapidly increased in recent years, and this Region has played an important role with East Kalimantan. Bukit Asam Colliery (South Sumatra) is the biggest coal mine in Indonesia since 1986 in annual production. In Bengkulu province, four mines are now operated by PT. Bukit Sunur, PT. Danau Mas Hitam, PT. Cipta Sumber Alam, PT. Ngalam Reksa Utama, and the annual total production is about 0.8 million MT.

Tin production in Bangka and Belitung islands accounts for over 80% of the country's production. Smelting plant in Bangka produced 30,390 MT in 1990 year (1985; 20,909 MT, 1986; 22,170 MT, 1987; 24,330 MT, 1988; 28,365 MT, 1989; 29,916 MT, 1990; 30,390 MT). Cumulative production of gold and silver in Bengkulu province are counted up 3.75 and 18.75 tons (1986-1990), in Lampung province, are counted up 34.2 and 168.4 kg (1989-1990) respectively.

Table 4.2.2 Past Production Trends of Main Minerals

Province	Unit	1980	1985	1986	1987	1988	1989	1990
South Sumatra								
Crude Oil	10 ³ Brl	20,377	30,495	31,638	32,911	37,317	37,336	32,989 (1)
Natural Gas	MMSCF	106,059	115,630	122,208	125,435	127,886	146,095	159,618 (1)
Coal	10 ³ ton	161	720	1,015	1,348	1,858	3,405	4,203 (2)
Tin	ton	n.a	19,698	21,598	22,901	24,789	26,759	27,487 (3)
Limestone	10 ³ m ³	n.a	522	344	647	250	841	501 (3)
Bengkulu								
Coal	10 ³ ton	-	23	132	283	468	829	818 (4)
Gold	kg	-	-	423	575	898	933	921 (4)
Silver	kg	-	-	2,116	2,875	4,740	4,937	3,613 (4)
Lampung								
Coal	10 ³ ton	-	-	-	-	12	13	15 (4)
Gold	kg	-	-	-	-	-	16	15 (4)
Silver	kg	-	-	-	-	-	80	72 (4)
Indonesia								
Crude Oil	10 ³ Brl	577,016	489,919	514,912	512,429	491,511	514,185	522,082 (1)
Natural Gas	MMSCF	1,045,748	1,580,012	1,628,920	1,732,052	1,846,861	1,975,421	2,089,559 (1)
Coal	10 ³ ton	338	2,000	2,559	3,027	4,494	8,701	10,639 (5)
Gold	kg	248	2,619	3,304	3,752	4,731	5,239	6,109 (6)
Silver	kg	2,196	38,327	46,596	50,485	61,538	62,396	68,774 (6)
Tin	ton	32,527	21,579	24,049	26,093	30,590	31,256	34,289 (6)

Sources: (1) Directorate General MIGAS (Ministry of Mines and Energy)
 (2) P.T. Bukit Asam
 (3) Palembang office of Ministry of Mines and Energy.
 (4) Branch offices of Bengkulu and Lampung (Ministry of Mines and Energy)
 (5) Directorate of Coal (Ministry of Mines and Energy)
 (6) Statistik Indonesia.

Note: Crude oil and natural gas produced from Jambi are included in South Sumatra.

4.2.2 Energy Consumption

(1) Primary Energy Consumption in Indonesia

The past trends of commercial energy consumption by source are as shown in Table 4.2.3. Table 4.2.4 shows the past trends of oil production and consumption including net oil export. Table 4.2.5 also shows the past trends of domestic sales of petroleum fuels by sector.

Table 4.2.3 Energy Consumption 1969/70 - 1990/91

(Unit: Million BOE)

F. Year	Coal	N. Gas	Hydro.	Geoth.	Oil	Total	Growth Rate
1969/70	0.84 (1.77)	4.74 (9.97)	0.74 (1.55)	0.00 (0.00)	41.19 (86.70)	47.51 (100)	69/70-74/75 12.58%
1974/75	0.80 (0.94)	5.04 (5.88)	3.72 (4.34)	0.00 (0.00)	76.22 (88.84)	85.79 (100)	74/75-79/80 14.88%
1979/80	0.72 (0.42)	28.31 (16.54)	4.74 (2.77)	0.00 (0.00)	134.41 (80.27)	171.18 (100)	79/80-84/85 6.11%
1984/85	1.97 (0.86)	44.20 (19.35)	14.02 (6.14)	0.44 (0.19)	167.83 (73.47)	228.44 (100)	2.15%
1985/86	7.54 (3.12)	48.85 (20.23)	17.66 (7.31)	0.45 (0.19)	167.00 (69.15)	241.51 (100)	5.72%
1986/87	10.65 (4.19)	53.93 (21.19)	21.60 (8.49)	0.47 (0.18)	167.90 (65.96)	254.55 (100)	5.40%
1987/88	14.51 (5.33)	58.76 (21.59)	18.57 (6.83)	1.44 (0.53)	178.84 (65.72)	272.11 (100)	6.90%
1988/89	20.47 (6.99)	61.89 (21.13)	18.97 (6.91)	2.07 (0.71)	188.28 (64.27)	292.94 (100)	7.65%
1989/90	24.40 (7.72)	65.00 (20.56)	24.00 (7.59)	2.00 (0.63)	200.70 (63.49)	316.10 (100)	7.92%
1990/91	26.80 (7.71)	70.60 (20.32)	20.20 (5.82)	2.20 (0.63)	227.70 (65.53)	347.50 (100)	9.93%

Source: Kebijakan umum Bidang Energi, BAKOREN, 1 April 1990.
Office of Ministry of Mines and Energy

Table 4.2.4 Oil Production and Consumption

(Unit: Million Barrels)

	1986	1987	1988	1989	1990
Production	514.9	512.4	491.5	514.7	533.7
Consumption	167.8	198.6	195.7	216.8	258.5
Exports	380.2	354.3	340.3	347.1	345.1
Imports	33.1	40.5	44.5	49.4	69.9
Net Exports	347.1	313.8	295.8	297.4	275.2

Source: MIGAS, Ministry of Mines and Energy

Note : Includes crude oil, condensate and refined products

Table 4.2.5 Domestic Sales of Petroleum Fuels by Sector

(Unit: 000kl)

	1970	1975	1980	1985	1990
Household	2,732	4,882	7,783	6,983	7,780
Transportation	2,242	4,029	7,199	8,586	13,315
Electric Power	312	628	1,831	3,285	4,304
Industry	1,551	3,394	5,232	5,338	6,777
Total	6,842	12,933	22,045	24,192	32,176

Source: MIGAS, Ministry of Mines and Energy

Note: Excludes own use. Unit 1kl = 6.29 Barrels

The energy consumption in Indonesia has rapidly increased in line with economic growth. During the period of 1960-1970, the growth rate was 7.4% per annum. The mean annual growth rates during 1960/79-1974/75 and 1974/75-1979/80 were 12.6% and 14.9% respectively. In 1980's the annual growth rates were reduced to 6.1% (1979/80-1984/85) and 6.7% (1985/86-1990/91). The growth rates of 1989/90 and 1990/91 were 7.9% and 9.9%. Recent increase is mainly dependent on the growth of transportation sector and the activities of industrial sector.

Oil consumption during the last ten years (1979/80-1989/90) grew at an average of 4.1% per annum. This growth rate was lower than the total energy consumption. The share of oil in total energy consumption has gradually decreased. However, the amount of the domestic consumption continues to increase, especially, caused by the demand growth for transportation sector (See Table 4.2.5).

Natural gas consumption increased rapidly from 28.3 million BOE (1979/80) to 65.0 million BOE (1989/90), and the share grew from 10.0% in 1969/70 to 20.6% in 1989/90. The growth is due to the operation of LNG and LPG plants, and the expansion of gas utilization in fertilizer plants and refinery.

Coal consumption also increased rapidly from 0.72 million BOE (1979/80) to 24.4 million BOE (1989/90) at an annual growth rate of 42.2% average. The share has recently expanded. This is due to the commissioning of Suralaya coal thermal power station and the expansion of coal utilization by cement industry. In addition to domestic consumption, coal export is forming an increasing trend of late years (See Table 4.2.6). Coal and Natural Gas are expected as hopeful future fuels in Indonesia.

Hydro-power has increased by the construction of large scaled dams such as Asahan and Saguling. In recent years, mini- and micro-hydropower have been developed for the rural electrification of isolated areas. Geothermal energy has been developed for the electric power generation.

Table 4.2.6 Coal Production, Consumption and Export

	(Unit: 000Ton)						
	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
Production	2,072	2,750	3,479	5,176	9,478	10,696	13,500
Consumption							
Electricity	212	470	1,748	2,043	4,600	4,762	4,800
Cement	468	616	847	939	1,480	1,878	2,100
Export	1,018	975	994	1,536	2,692	4,624	6,600

Source: Directorate of Coal, Ministry of Mines and Energy

Note: Estimated figures in 91/92

(2) Energy Consumption in the Region

The primary energy consumption (petroleum fuels) in the Region is shown in Table 4.2.7. And production of petroleum fuels in the Region is shown in Table 4.2.8. According to Tables 4.2.7 and 4.2.8, M.Solar (Automotive Diesel Oil) itself can be no longer supplied in the Region today. Table 4.2.9 shows sales performance of petroleum fuels by each province.

Table 4.2.7 Sales of Petroleum fuels in the Region

(Unit: 000KI)

	Avgas	Avtur	Premium	M. Tanah	M. Solar	M. Diesel	M. Bakar	Total
1985	0.2	19.2	272.6	417.1	731.9	124.1	58.0	1,623.1
1986	0.1	19.4	273.7	405.9	744.7	121.5	43.4	1,608.8
1987	0.1	21.1	316.8	432.5	786.7	103.1	45.9	1,706.3
1988	0.0	22.3	350.0	450.1	871.2	120.3	57.0	1,870.8
1989	0.1	25.5	386.5	479.8	1,072.9	117.8	25.2	2,107.8
1990	0.1	26.5	415.0	494.8	1,151.1	115.0	44.2	2,247.3
1991	0.1	24.3	421.5	516.1	1,222.7	114.8	51.3	2,350.7

Source: Palembang office of Ministry of Mines and Energy

Note: M.Tanah; Kerosene, M.Solar; Automotive Diesel Oil, M.Diesel; Industrial Diesel Oil, M.Baker; Fuel Oil

Table 4.2.8 Production of Petroleum Fuels in the Region

(Unit: 000KI)

	Avgas	Avtur	Premium	M. Tanah	M. Solar	M. Diesel	M. Bakar	Total
1990	16.3	73.4	1,249.0	602.4	964.4	317.2	877.1	4,099.8
1991	5.6	72.6	1,288.9	609.4	952.9	343.3	773.6	4,046.3

Source: Palembang office of Ministry of Mines and Energy

Table 4.2.9 Sales of Petroleum Fuels by each Province

(Unit: Kilo Liter)

	Avgas	Avtur	Premium	M. Tanah	M. Solar	M. Diesel	M. Bakar	Total
Jambi								
1990	12	3,619	58,728	60,948	203,979	0	23	327,309
1991	12	2,800	61,573	65,523	228,399	0	0	358,307
S. Sumatra								
1990	126	19,593	175,185	235,565	512,273	118,424	41,560	1,103,330
1991	79	18,745	185,173	236,517	528,373	174,747	32,501	1,176,137
Bengkulu								
1990	0	3,325	35,475	33,770	68,130	0	1,131	141,831
1991	0	2,755	36,990	33,246	62,469	0	0	135,460
Lampung								
1990	0	0	133,631	173,503	366,747	0	1,672	675,533
1991	0	0	137,492	181,496	399,879	0	17,343	736,210

Source: Palembang office of Ministry of Mines and Energy

4.2.3 Power Supply

(1) Power Generation

Total power generation of PLN (Perusahaan Listrik Negara) in 1990/91 was 34,868 GWh (including purchased power). Sales power, which subtracted transmission and distribution losses and self-consumption from power generated, became 27,741 GWh.

Table 4.2.10 shows installed capacity and generated power of PLN in 1990/91. According to Table 4.2.10, thermal power (steam turbine) becomes main power in Indonesia. However, in the Region, which coincides with Region IV designated by PLN except kab. Kerinci in Jambi, small diesel generators play a significant role even now. The mix of installed capacity in Indonesia had changed from diesel (36.9%) and hydro-power (36%) in 1969/70, to gas turbine (35.8%) and oil thermal power (29.6%) in 1979/80, and to oil and coal thermal (43.4%) and hydro power (21.7%) in 1989/90. It is supposed that many diesel units with average capacity of below 1 MW are set in each province, and the total facility

Table 4.2.10 Installed Capacity and Power Generation in 1990/91 (PLN)

Province	Hydro		Steam (Coal)		Steam (Oil)		Diesel		Gas Turbine		Geothermal		Total				
	Units	MW	Units	MW	Units	MW	Units	MW	Units	MW	Units	MW	Units	MW	Peak		
Jambi	-	-	-	-	-	-	52	49.1	134.1	-	-	-	52	49.1	134.1	26.5	
S.Sumatra	-	-	2	130.0	2	25.6	144	120.9	238.5	4	64.9	19.5	152	341.4	819.7	141.7	
Bengkulu	4	2.4	-	-	-	-	50	28.3	70.5	-	-	-	54	30.7	74.1	18.1	
Lampung	-	-	-	-	-	-	100	104.0	274.4	-	-	-	100	104.0	274.4	57.6	
Region	4	2.4	2	130.0	2	25.6	346	302.3	717.5	4	64.9	19.5	358	525.2	1,302.3	243.9	
		(0.5)		(24.8)		(4.9)		(57.5)	(55.1)		(12.3)	(1.5)		(100.0)	(100.0)		
O.Java	51	281.3	10	440.6	1,382	2,760	1,741.7	3,408	18	427.3	1,375	-	2,389	2,890.8	6,794	1,332.7	
Java	86	1,813.8	5,046	24	3,500.0	20,046	177	127.9	200	26	802.8	800	3	140	1,125	4,565.4	
Indonesia	137	2,095.1	5,675	34	3,940.6	21,428	2,937	1,869.6	3,608	44	1,203.1	2,175	3	140	1,125	34,012	5,898.1
		(22.6)	(16.7)	(42.5)	(63.0)		(20.1)	(10.6)	(6.4)		(13.3)	(3.3)		(100.0)	(100.0)		

Note: Unit: No. of generators, MW; Installed capacity (MW), Gwh; Generated power (Gwh), Peak; Peak Load (MW).
 Figures in () indicate share (%).
 Column of steam (Coal) in outside Java, Java and Indonesia shows total of coal and oil.

Sources: Data dan statistik 1990/91 (PLN wilayah IV April 1991), and PLN office.

efficiency is low. This is also comprehensible in the same way from the ratio of installed capacity and peak load in each region (the ratio; Region 2.3, outside Java 2.2, Java 1.4, Indonesia 1.6).

Table 4.2.11 shows share of captive power generation. The share of captive power generated by consumers themselves, mainly large scale companies of industrial sector, accounts for 49.2% of total generation and 44.4% of total installed capacity in Indonesia. In the Region, the share accounts for 73.0% of generation and 56.7% of installed capacity. This share is almost equal in the area out side Java. In South Sumatra, the share of captive power accounts for 76.6% of the total generation in the province. Main reason of this situation is due to self-generation of oil refineries (PERTAMINA) and fertilizer factories (PUSRI). On the other hand, the share of captive power generation in Java is lower than that of out side Java. In Java, the installed capacity and generation of PLN herself are large and system interconnection has been already completed.

Table 4.2.11 Share of Captive Power Generation (1990/91)

	Installed Capacity (MW)			Generation (GWh)		
	PLN	Captive Power	Share (%)	PLN	Captive Power	Share (%)
Jambi	49.12	57.97	54.1	134.06	265.01	66.4
S. Sumatra	341.37	494.37	59.2	819.80	2,690.68	76.6
Bengkulu	30.72	7.23	19.1	74.08	21.54	22.5
Lampung	104.02	129.61	55.5	274.36	542.05	66.4
Region	525.23	689.18	56.7	1,302.30	3,519.28	73.0
Outside Java	2,890.85	4,200.38	59.2	6,794.15	21,808.47	76.2
Java	6,384.57	3,251.18	33.7	27,217.55	11,155.34	29.1
Indonesia	9,275.42	7,451.56	44.5	34,011.70	32,963.81	49.2

Source: Directorate General of Electricity and New Energy.

Note: Share (%) means outside PLN/(PLN+outside PLN)*100

(2) System Interconnection

System interconnection is partially completed in the Region. In South Sumatra province, Palembang - Simpang Tiga - Prabumulih - Tanjung Enim transmission line of 150 kv has already existed. In Bengkulu, Bengkulu - Curup - Tes line of 70 kv is extending to Muara Aman. The most hopeful construction of transmission line of 150 kv in the Region is now progressing from Tanjung Enim toward Tarahan (Lampung). Interconnection of Tanjung Enim - Lahat - Pagar Alam is to be completed in 1992/93.

According to PLN, further interconnection is under survey and planning on the basis that Palembang - Tanjung Enim - Tarahan line forms the main artery of power system. The plan consists of the linkage between Jambi and Prabumulih of Palembang - Tanjung Enim line, and the linkage between Bengkulu and Tanjung Enim.

(3) Rural Electrification

The situation of rural power generation and electrification are as shown in Table 4.2.12 and Table 4.2.13 respectively. Installed capacities and power generated for villages are extremely small compared with province values including urban area. In the Region, the ratio of rural and total value in power generation and installed capacity are 3.44% and 4.11% respectively. Such low levels are due to low electrification rate of rural households (9.3%,

see Table 4.2.13) and low demand per capita (3.42 kWh, see Table 4.2.12). The average of power consumption per capita in the Region is 62 kWh.

As shown in Table 4.2.13, electrification rate is different in each Kabupaten, and the average is lower than that of other regions. In consequence, the electricity consumption per capita of rural area in each province is limited to 1/9 ~ 1/30 of province values that show the mean value in each province including urban area.

Table 4.2.12 Current Situation of Rural Power Generation

Province	No. of Unit	Installed Cap. (kW)	Maximum Cap. (kW)	Peak Load (kW)	Generation (MWh)
Jambi	25	2,600	2,274	1,777	5,298.9
S. Sumatra	77	10,710	7,888	5,747	15,996.7
Bengkulu	28	2,640	1,820	1,301	3,259.0
Lampung	53	8,860	5,704	5,888	20,238.4
Region	183	24,810	17,686	14,713	44,793.1

Province	Rural/Total (%)		Per Capita (kWh)	
	Generation	Installed	Rural	Province
Jambi	3.95	5.30	3.16	52.86
S. Sumatra	1.95	3.14	3.18	99.34
Bengkulu	4.40	8.60	3.23	47.24
Lampung	7.38	8.52	3.76	33.47
Region	3.44	4.72	3.42	62.00

Source: PLN, Wilaya IV office (Palembang)

Note: All units are diesel generators.

Table 4.2.13 Current Situation of Rural Electrification by Kabupaten

Province/ Kabupaten	No. of desas	Elec. desas	Elec. rate (%)	House Elec. (%)	Urban ratio (%)	Pop. den.	Pop. (1000)	Land area (km ²)	GDP/ capita (Rp mil.)
Jambi									
S.Bangko	257	49	19.1	6.9	4.2	25	350	14,200	0.34
B.Tebo	194	38	19.6	9.0	9.2	27	360	13,500	0.32
B.Hari	195	41	21.0	6.9	7.8	29	326	11,130	0.41
T.Jabung	105	10	9.5	7.1	7.6	36	362	10,200	0.35
Sub-total	751	138	18.4	7.5	7.2	29	1,398	49,030	0.35
S.Sumatra									
O.K.U	467	68	14.6	5.3	8.1	93	964	10,408	0.34
O.K.I	349	100	28.7	12.1	6.0	36	771	21,658	0.36
M.Enim	259	42	16.2	19.5	21.5	61	586	9,575	0.42
Lahat	578	233	40.3	24.1	16.9	149	599	4,034	0.41
M.Rawas	238	38	16.0	12.2	11.1	24	512	21,513	0.42
M.Banyuasin	300	37	12.3	4.7	3.4	34	884	25,664	0.82
Bangka	140	21	15.0	8.3	23.7	44	514	11,614	0.83
Belitung	54	9	16.7	17.3	53.4	43	193	4,532	0.64
Sub-total	2385	548	23.0	11.8	13.2	46	5,023	108,998	0.52
Bengkulu									
B.Selatan	381	105	27.5	16.7	7.0	50	298	5,949	0.34
R.Lebong	299	186	62.2	34.3	16.6	90	368	4,110	0.41
B.Utara	347	74	21.3	15.5	3.5	36	343	9,585	0.32
Sub-total	1027	365	35.5	22.8	9.3	51	1,009	19,644	0.36
Lampung									
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
Sub-total	1530	283	18.5	5.1	5.4	167	5,380	32,208	0.28
Total(Average)	5693	1334	23.4	9.3	8.9	61	12,810	209,880	0.39

Sources: 1) No. of Electrified Villages (1992,3) ; Palembang Office of Ministry of Mines and Energy, Jambi branch Office of PLN.
 2) Household Electrification Ratio (%) ; PLN Office of each Province, 1991.
 3) No. of villages (1990), Population (1990), Land area (1990), GDP/capita (1990) without Oil/Gas (1983 constant prices) ; Interim Report.

4.3 DEVELOPMENT CONCEPT

4.3.1 Development Potentials

(1) Mineral and Energy Resources

Main resources found and expected in each province are itemized as shown in Table 4.3.1. Oil and natural gas are transported through several pipe lines to Palembang. Production potential of gas in the Region is hopeful and new gas fields are detected recently. According to Palembang offices of PERTAMINA (Unit II) and the Ministry of Mines and Energy, cumulative production in the Region is 1,314 BSCF, and the reserve estimated is 2,289 BSCF. Almost gas produced is consumed by major users such as PUSRI (I - IV), PLN

(Kramasan) and KILANG in Palembang and Plaju. The new operation of gas plants (PUSRI IB, 1992, LPG MUSI 1994) is planned.

In Jambi province, coal, gold and tin are under exploration at present. Geothermal heat at Remas Kemunu village (Sungai Gerau, Kab. Sarko), hydro-power potential near Jangkat (Kab. Sarko), bentonite near Birku Tanjung (Kab. Sarko) can be expected as the others. Andesite, granite and clay quarried in the city of Jambi, andesite at Kenalissan (Kab. Batanghari) and clay near Muarabulian (Kab. Batanghari) are hopeful because of being close to urban areas.

Table 4.3.1 Main Resources Expected in Each Province (Excluding Oil and Gas)

Province	Location	Estimated Amount	Stage	Remarks
Jambi				
Coal	Kab.Bungo Tebo, Rantau Pandan	200 million ton	outcrop survey	Bituminous sub-bituminou
	Kab.Tanjung Jabung	n.a	"	
Gold	Kab.Sarko, to Bengkulu	n.a	under exploration	
Tin	Kab.Bungo Tebo, to Riau	n.a	"	
South Sumatra				
Coal	Kab.Muara Enim, Tanjung Enim	16 billion ton	now producing	PT.Bukit Asam
	" , others	1.3 billion ton	under exploration	
	Kab.Musi Banyuasin	3.3 billion ton	"	
	Kab.Musi Rawas	517 million ton	boring survey	
Gold	Kab.Lahat	138 million ton	under exploration	
	Kab.Musi Rawas	n.a	under exploration	
Tin	P.Bangka	490,584 ton	now producing	UPT.Bangka, PT.Koba Tin
	P.Belitung	233,280 ton	"	UPT.Belitung
Limestone	Kab.O.K.U, Karang Agung	16 million ton	now producing	PT.Prcussag
	" , Muara Dua	162 million ton	"	CaO 50~55%
	" , Tanj.lengkap etc.	170 million ton	"	CaO 40~55%
	" , Banding Agung etc.	about 4,300 ha	survey	CaO about 54%
Marble	Kab.Lahat, Sukajadi	27 million ton	"	CaO 40~55%
	Kab.Lahat, Sukajadi	88 million ton	now producing	strength 800 ~1500kg/cm ²
Bengkulu				
Coal	Kab.Bengkulu Utara	27 million ton	now producing	4200~800kcal/kg
	Kab.Bengkulu Selatan	20 million ton	under exploration	Brown coal
Gold	Kab.Bengkulu U, Lebong Tandai	451,501 ton(Ore)	now producing	PT.Lusang M.
	Kab.Rejang Lebong	n.a	under exploration	
Limestone	Kab.B.Utara, Kerkap I	2.73 million ton	survey	CaO about 40%
	Kab.B.Selatan, Bengkunanang	12.3 million ton	"	CaO 41~53%
Lampung				
Coal	Kab.Lampung Tengah, Linggapura	14 million ton	now producing	Bituminous
Gold	Kab.L.Utara, Blambangan Umpu	n.a	exploration	2.15~5.12gr/ton
	Kab.L.Selatan, Kedondong	1.21 million ton	now producing	PT.Karya B.U.
Marble	Kab.L.Tengah, Linggapura	16.5 million ton	survey	CaO 45~52%
	Kab.L.Sclatan, Padang Cermin	12.1 million ton	"	CaO 45~52%

Sources: Jambi; Jambi office of Ministry of Mines and Energy.
Others; Palembang office of Ministry of Mines and Energy.

South Sumatra province has a lot of underground resources. As for oil and gas, production potentials of 116.4 million barrels and 1.7 TSCF are expected respectively (by MIGAS). Coal is presumed to be a promising resources in the near future. PT. Batubara Bukit Asam will expand the mining area from Air Laya to Murga Tiga Besar and N. W. Banko in response to requirement of new thermal power plant under planning at Suralaya, Tarahan and Tanjung Enim. Coal reserves in South Sumatra is estimated to be 21 billion MT which is accounts for 65.8% of the total country's estimated reserves of 31.9 billion MT, and coal reserves within a radius of 20 km from Tanjung Enim is estimated about 5.5 billion MT according to Bukit Asam. As for Musi Rawas coal field, exploration by boring had been carried out in 1986-1988 by PT Indoboreg. Quality is sufficient for thermal coal because of low sulfur content (0.1%). Gold is now under exploration by PT. Barisan Mining, etc.

In Bengkulu province, several coal mining concessions are newly applicable for developing in addition to the area operated by four mines. At present, coal resources with heat value of around 6500 kcal/kg is mined for export, and next opening of mines within two or three years is under planning. Further development will be possible if the domestic demand for coal with heat value of around 5000 kcal/kg is found. Limestone resources at Murga Seluma and Lb. Tandai can have the chance of development with the activities of cement industry. Offshore borings for oil exploration are now underway along the west coast of the province. Regarding geothermal energy at Tes, it is necessary to survey in detail.

In Lampung province, an underground gold mine is under operation near Kedondong by PT. Karya Bukit Utama, and further development is expected depending on quality and quantity of deposits. One coal mine is also operating underground at Linggapura (Kec. Padang Ratu). According to PT. Bukit Sulah Perdana, coal quality is high calorie (7000 kcal/kg, as received base) and low moisture content, but sulfur content is high. Since the scale of both production and deposit is small, it seems best to link the operation to the coal transportation line from Tanjung Enim to Tarahan. Regarding geothermal potential, it is confined within the stage depending on results of deep borings from surface.

(2) Power Development Plan

Figure 4.3.1 shows current situation of power system interconnection and power source potential in the Region. At present, power source mix in the Region consists of hydro (0.5%), thermal (29.7%), diesel (57.5%) and gas turbine (12.3%). Facility development Plan by PLN is shown in Table 4.3.2. According to the plan, source mix of generating capacity will consist of hydro 559.2 MW (41.1%), coal thermal 390.0 MW (28.7%), diesel 346.8 MW (25.5%) and gas turbine 63.4 MW (4.7%) in 2000.

Hydro potentials are expected from the Merangin River in Jambi, and from the Selabung, Lamatang and Musi in South Sumatra, and from the Manna and Ketahun in Bengkulu, and from the Basai and Giham River in Lampung province. As the power source for rural electrification, mini-hydro (over 100 kW) and micro-hydro power (below 100 kW) are expected. Bengkulu province has relatively high mini-hydro potential of about 490 MW (number of points 38), however, details is not clear. On the other hand, mini- and micro-hydro potentials of about 9 MW (5 points), 15 MW (15 points), and 6 MW (14 points) are estimated in Jambi, South Sumatra and Lampung province respectively.

Geothermal potential is recognized in each area of Kerinci, Sumbing, Kunit, Belirang Beriti in Bengkulu, and of Sekincau, South Antatai, Ulubelu and Kalianda in Lampung province. However, detailed examination have not been carried out except Kerinci area at present. The possibility of effective utilization is considered to be dependent on results of further examination including boring exploration.

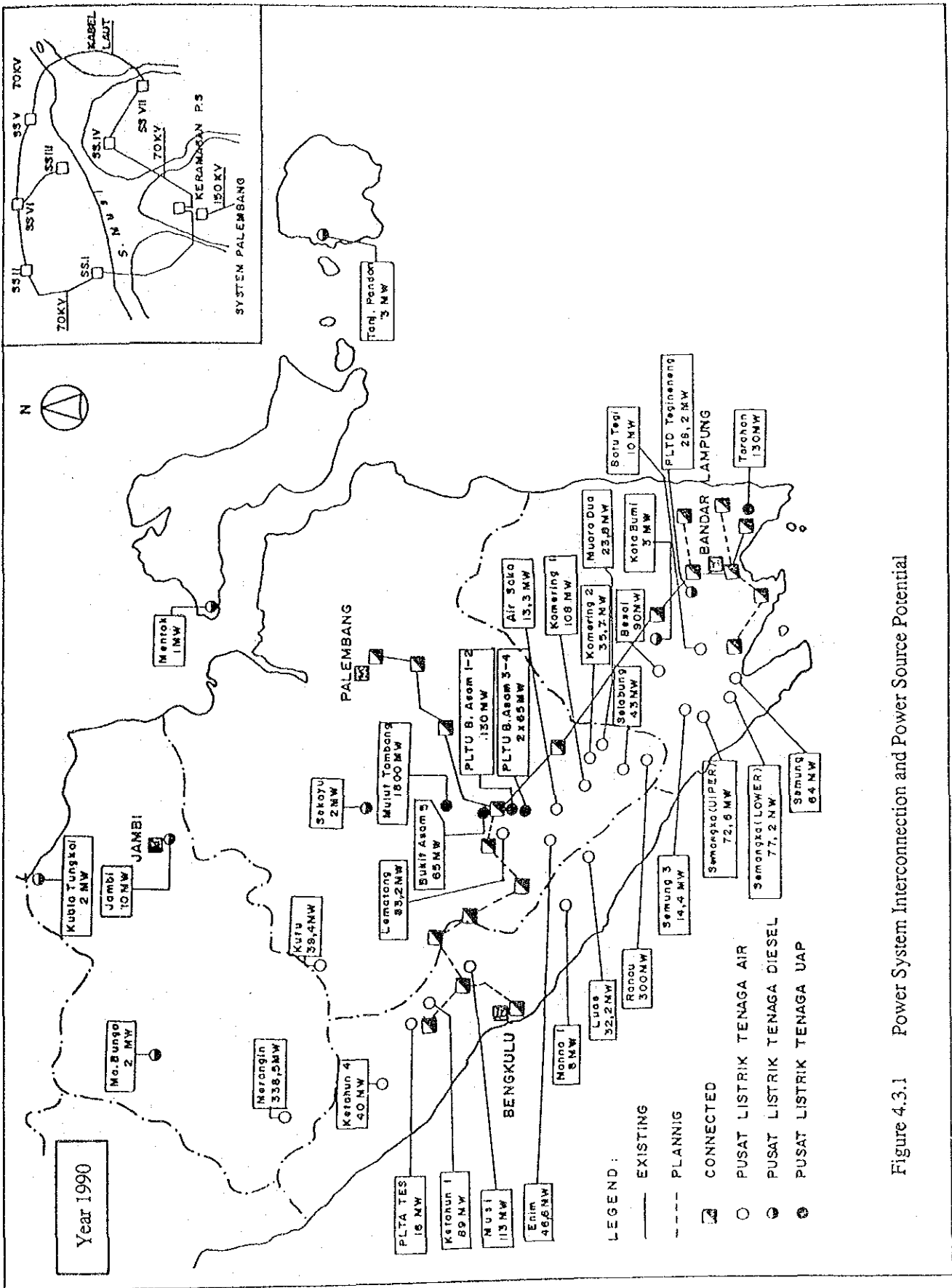


Figure 4.3.1 Power System Interconnection and Power Source Potential

Table 4.3.2 Facility Development Plan (PLN)

	Location			Capacity	Year	
Thermal	Kramasan	(S.Sumatra)	#1, #2	12.5	MWx2 Oil	1974
	Bukit Asam	(S.Sumatra)	#1, #2	65	MWx2 Coal	1987
	Bukit Asam	(S.Sumatra)	#3	65	MW Coal	1993/94
	Bukit Asam	(S.Sumatra)	#4	65	MW Coal	1994/95
	Tarahan	(Lampung)	#1	17	MW Coal	1991/92
	Tarahan	(Lampung)	#3	65	MW Oil	1995/96
	Tarahan	(Lampung)	#4	65	MW Coal	1996/97
	Jambi	(Jambi)	#1, #2	25	MWx2 Coal	1998
	Palembang	(S. Sumatra)	#1	30	MWx2 Gas	1999
Diesel	Tarahan	(Lampung)	#2	10	MW	1991
	Tagineneng	(Lampung)		10	MWx3	1992
	Jambi	(Jambi)		5	MWx2	1992
Hydro	Tes	(Bengkulu)		0.66	MWx2	1957
	Curup	(Bengkulu)		1	MW	1985
	Tes	(Bengkulu)	#1-#4	16	MW	1991/92
	Basai	(Lampung)		90	MW	1996/97
	Musi	(S. Sumatra)		210	MW	1999/00
	Merangin	(Jambi)		338.5	MW	1999/00
	Ketahun	(Bengkulu)		84	MW	2002/03

Source: PLN.

4.3.2 Development Concept

(1) Energy Demand

Table 4.3.3 shows a preliminary forecast of primary energy demand (commercial energy) up to 2010. Demand for commercial energy of 2010 becomes 3.4 times of 1990 in the case of economic frame 3 (basic case). In low or high growth cases, the values are 2.8 and 5.0 respectively. Commercial energy consumption per capita is estimated in Table 4.3.4.

Table 4.3.5 shows the past performance (1975-89), and forecast (1990-2010) of non-commercial energy. The past performance is due to the estimation of International Energy Agency.

Table 4.3.3 Primary Energy Demand Forecast (Commercial)

Frame work	GDP Growth	(Unit: Million BOE)						
		1990	1995	2000	2005	2010	Energy Growth Rate	
							1990-2000	2000-2010
1	5%	347	454	593	757	765	5.5	5.0
2	8%	347	529	807	1,185	1,741	8.8	8.0
3	6%	347	478	658	880	1,178	6.6	6.0

Note: Team estimate

Table 4.3.4 Per Capita Energy Consumption (Commercial)

Frame work	(Unit: BOE per capita)								
	1975	1980	1985	1989	1990	1995	2000	2005	2010
1	-	-	-	-	1.94	2.33	2.84	3.42	4.14
2	-	-	-	-	1.94	2.72	3.87	5.35	7.46
3	-	-	-	-	1.94	2.46	3.15	3.97	5.05
Past Trend	0.73	1.24	1.39	1.68	1.94	-	-	-	-

Source: (1990-2010) Team estimate
(1975-1989) IEA, Energy Statistics and Balances of Non-OECD Countries, 1988/89.

Table 4.3.5 Performance and Forecast of Non-Commercial Energy Consumption

	(Unit: Million BOE)								
	1975	1980	1985	1989	1990	1995	2000	2005	2010
Non-Commercial	174	193	216	233	237	255	275	293	313
Commercial (Frame 3)	99	183	229	305	347	478	658	880	1,178
Total	260	364	458	549	584	733	933	1,173	1,491
Non-Commercial /total (%)	66.9	53.0	47.2	42.4	40.6	34.8	29.5	25.0	21.0

Source: (1990-2010) Team estimate
(1975-1989) IEA, Energy Statistics and Balances of Non-OECD Countries, 1988/89.

(2) Power Demand

The power demand in the Region has increased rapidly in pace with annual growth rate of 16.4% (1975-80), 13.6% (1990-85), and 18.3% (1985-90) as shown in Table 4.3.6. It is presumed that the driving force of the powerful growth is due to industrial demand increase on the basis of continuing residential demand. The power sold for industrial use in 1991/91 was 389.2 GWh consisted of manufacture demand of 374.7 GWh (96.3%) and hotel demand of 14.5 GWh (3.7%). Regarding the power consumption of manufacturing industry, captive power by self-consumers holds major position as described before. The captive power generation in 1990/91 was 3,519 GWh (See Table 4.2.11). Such a industrial demand suggests the possibility that new industrial activities will be in need of public power supplied by PLN in the future. The turnover from self consumers to users of public power will still more push up the power demand in the Region.

Table 4.3.7 shows the result of a preliminary estimate for the power demand in the Region. Estimate is carried out on the basis of per capita consumption forecasting up to 2010. By the result of demand forecasting, sales power of 10,630 GWh is required in 2010. Installed capacity in 1995, 2000, 2005 and 2010 are estimated to be about 800 MW, 1500 MW, 2500 MW and 4300 MW respectively. According to this estimate, it is considered that supply and demand balance will be tight under the current facility development plan even before 2000.

Table 4.3.6 Past Trends of Sales Power (PLN)

Fiscal Year	Annual Growth Rate (%)			Power Sold 1990/91 (GWh)
	1975-90	1980-85	1985-90	
Region	16.4	13.6	18.3	967.7
Residential	17.0	12.1	13.6	417.6
Commercial	17.4	11.0	12.7	81.7
Public	15.8	7.8	11.4	79.2
Industrial	15.7	24.2	31.8	389.2
Outside Java	23.1	12.9	16.5	5,697.7
Java	17.9	14.6	17.1	22,043.3
Indonesia	18.9	14.2	16.9	27,741.0

Source: PLN

Table 4.3.7 Power Demand Forecast (PLN)

Province	Power Sold 1990/91 (GWh)	Annual Growth Rate (%)				Power Demand 2010/11 (GWh)
		1990-1995	1995-2000	2000-2005	2005-2010	
Jambi	106.7	18.8	14.5	12.0	11.0	1,470
South Sumatra	604.8	14.5	11.7	11.0	10.0	5,610
Bengkulu	55.7	14.1	12.1	11.5	11.5	570
Lampung	200.5	19.9	14.5	12.5	11.5	2,980
Resign	967.7	16.1	12.8	11.5	10.6	10,630
Outside Java	5,697.7	16.1	13.0	12.0	-	-
Java	22,043.3	14.3	10.8	8.0	-	-
Indonesia	27,741.0	14.7	11.3	9.0	6.5	198,000

Note : Annual growth rate up to 2000 is calculated on the basis of PLN data.

Source: Team's estimate

(3) Intensification and Diversification

The Region has the potential to increase energy production. Pertamina found a new oil well with a capacity of 2,454 barrels per day in the Baturaja Formation in Guruh field, Ogan Komering Block in South Sumatra (The Jakarta Post, July 29, 1992). And many fairly big gas reserves found newly by Asamera in South Sumatra.

Active surveying and exploration can find new potentials which can supply economically energy and useful materials. Regarding geothermal potential, eight prospects were explored by Pertamina recently. These include Sungai Penuh (Jambi), Lumut Balal (South Sumatra), and Rajabasa, Ulubelu, Suoh Sekincau, Suoh Antatai (Lampung). Further exploration and evaluation are needed to use newly oil and gas, coal, hydropower, geothermal, and new energy.

Regarding coal, survey and exploration around Tanjung Enim have been carried out. And several feasibility studies and Pre-feasibility studies were conducted. Coal reserves in these areas except Muara Tiga Besar and Banko Barat are estimated as "indicated reserves". Detailed examination is required. In addition to the fields explored, new boring explorations in hopeful areas such as Musi Rawas (South Sumatra) and Rantau Pandan (Jambi) are needed.

South Sumatra has vast coal resources, which accounts for about 58.5 (according to PT. Batubara Bukit Asam, 65.8%) of country's total estimated reserves at the present. Coal in Indonesia is located predominantly in Central and Southern part of Sumatra and East and South Kalimantan. Total resources were estimated at 32 billion tons, of which 4.2 billion tons were classified as measured reserves, 12.9 billion tons as indicated and inferred reserves, and remaining 15 billion tons as hypothetical reserves. In general, geological conditions of coal measured seams are stable and mining condition are desirable for open cast mining. Coal qualities vary by the carbonization of each field. However, coal of the major fields has a low ash, low sulfur and high volatile matter content, except only a fault of high moisture content. A high volatile coal with low sulfur and low ash fit for thermal power generation.

In 2010, coal accounts for 20-25% of total commercial energy consumption. The amount of coal produced for domestic use is estimated to be 235-295 million BOE (47-59 million TCE). In the Region, production target of 33-42 million TCE can be considered for domestic use.

Electricity power can play the leading part for the diversification of energy mix in Indonesia. Figure 4.3.2 shows the conceptual view of the power system interconnection (2010 vision).

4.4 ISSUES AND STRATEGY

4.4.1 Issues

(1) Mining

In order to identify the development potentials of mineral and energy resources, further survey and exploration are required. Oil and gas reserves are found in medium and smaller-sized fields in recent years. However, domestic demand is increasing rapidly. An active exploration is required if Indonesia is to sustain its productive capacity. The other exploration activities also should be continued to fully utilize the natural resources in the Region.

State-owned coal mine, PT. Tambang Batubara Bukit Asam (South Sumatra), has the plan to double the amount of production by 1998 with the development of two fields, Muara Tiga Besar and N.W. Banko. The greatest constraint is insufficiency of transportation capacity from mine to port Tarahan. It is needed to improve its haulage capacity to meet the needs of coal transport over ten million tons per annum and other railway traffic demands.

Indonesia has two policies concerning major coal fields development, that is, one is the development policy of main coal fields by a state-owned coal mining company in Sumatra, and the other is the development by foreign investors through contractual agreements in East Kalimantan. The large scale coal development requires huge investment and leading time. Active incentives to invite private's sectors are required for the mine development is South Sumatra.

Tin production in Bangka and Belitung is decreasing under the circumstances of price fluctuation in the international market. Major producer is PT. Tambang Timah, state-owned company, accounted for about 80% of Indonesian tin output. tin mining is operating at both offshore and surface. Offshore mining is still now hopeful by use of dredging method.

Table 4.4.1 and Table 4.4.2 show the recent trends of tin production and sales performance. The performance has a tendency toward decreasing. In order to cope with movements of market, it is necessary to adjust tin mines by rationalization and technical renovation.

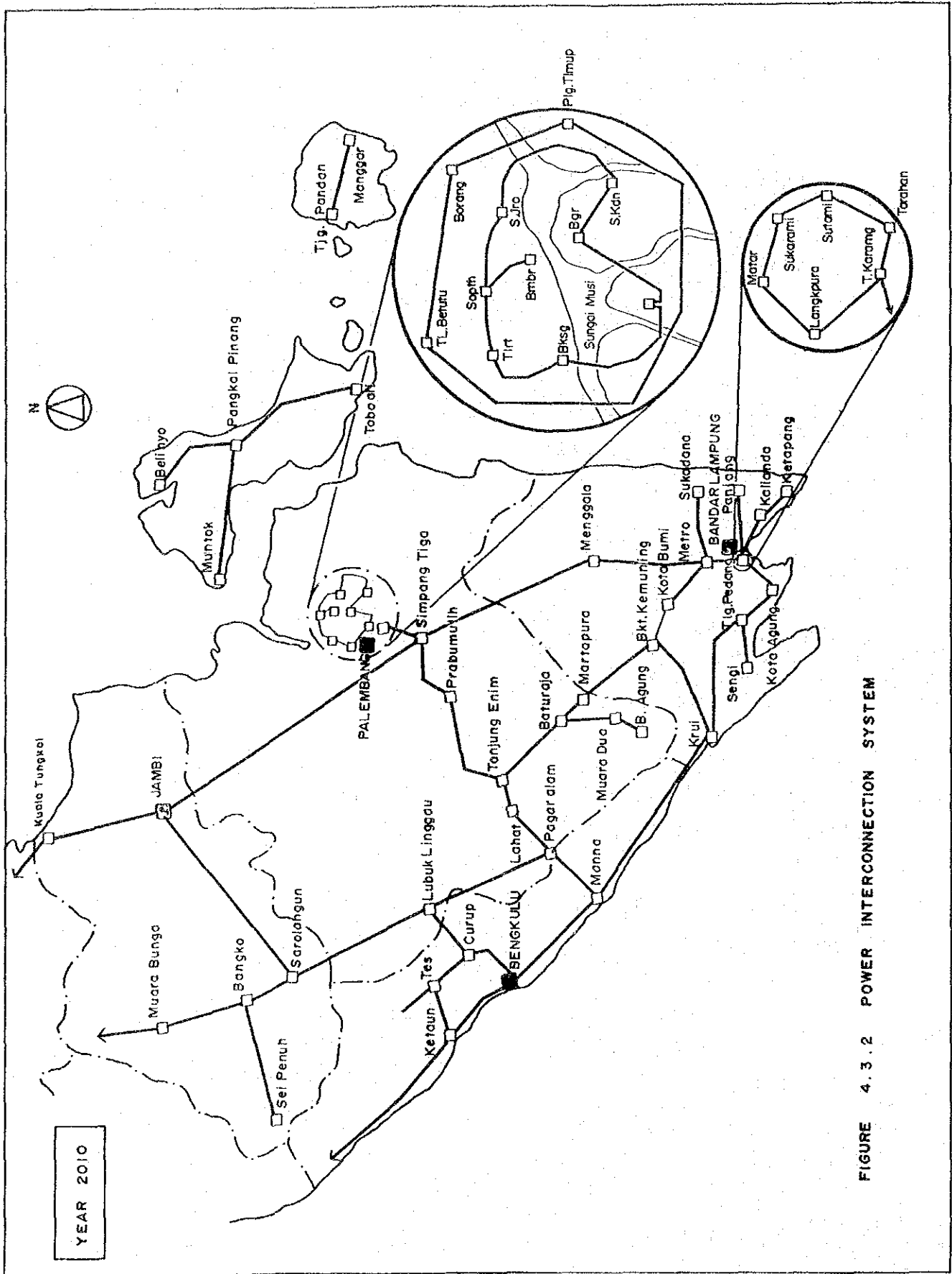


Table 4.4.1 Tin Production and Export (Bangka and Belitung)

(Unit: ton)								
	Mine Production				Total	Smelting Mentok Plant	Sales	
	PT. Tambang Timah (Bangka)	(Belitung)	PT. Koba (Bangka)	PT. G.KI-Kara (Belitung)			Export	Domestic use
1986	12,900	3,850	4,269	579	21,578	22,170	23,426	1,166
1987	12,783	5,544	4,043	531	22,901	24,330	22,292	881
1988	12,689	5,479	6,002	619	24,789	28,365	23,805	1,338
1989	14,363	4,957	7,035	404	26,759	29,916	24,706	1,401
1990	14,259	5,512	7,422	295	27,487	30,390	25,795	1,379
1991	16,334	3,212	7,679	215	27,441	30,415	24,245	1,261

Source: Palembang office of Ministry of Mines and Energy

Table 4.4.2 Past Trends of Tin Sales (Bangka and Belitung)

		1986	1987	1988	1989	1990	1991
Export							
Sales	(US\$ million)	140.3	144.8	160.2	214.6	153.3	129.7
Price	(US\$1,000/ton)	5.969	6.493	6.729	8.346	5.942	5.352
Domestic							
Sales	(Rp. million)	8,041	9,218	15,463	20,283	15,624	13,423
Price	(Rp. 1,000/kg)	6.90	10.47	11.55	14.47	11.33	10.65

Source: Palembang office of Ministry of Mines and Energy

(2) Energy

Electric power demand in the Region has rapidly grown in these years, and still now is continuing to keep high growth rate as described before. The possibility of power-shortage in the Region is already pointed out by the power facilities development plan of PLN. Power development is one of the most urgent problem that faces Provincial Governments.

The power system interconnection (150 kv and 70 kv AC network) in the Region is now under construction. Power demand with high growth rate requires the extension program of the on-going interconnection project.

The past performances of rural electrification in the Region is shown in Table 4.4.3. Rural electrification has steadily progressed. Further progress is expected for the improving of life style of the people.

Table 4.4.3 Rural Electrification in the Region

	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91
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

Major issues to be achieved for 2010 can be summarized as follows:

- 1) Promotion of power development
Electricity is an important factor in the regional and national economy. The importance has been signified by the rapid growth of industrial sector. Active and ambitious development plan is needed.
- 2) Promotion of rural electrification
Improvement of electricity supply for villages and households means human development.
- 3) Combination of the extension of power system interconnection and rural electrification is required.
- 4) Improvement and development of coal transportation capacity.
The improvement of railway transportation system is required especially.

4.4.2 Strategy

(1) Mining

The large scale coal development requires a long leading time and a huge investment. National development plan for further investigation of coal fields is needed over the whole area and particularly in South Sumatra for the time being. As described in power section previously, power supply and demand balance will become tight after five or ten years. The Region, especially south Sumatra province, should prepare in order to ensure the position as a big energy supply country.

In general, the development of large scale coal mines is needed the following procedure.

- 1) Geological survey
- 2) Detailed examination by boring exploration.
- 3) Compilation of necessary information for pre-feasibility study or Feasibility study.
 - Geological maps and geological structure of coal seams
 - Contour line maps on the thick of coal seams and coal quality (heating value, water content, ash content, sulfur content).
 - Cost estimation and supply curve.
Cost consist of Ex-mine cost (labor cost + facility cost + operation cost + capital cost), transportation cost, and shipping cost. Supply curves represent the relationship between cost and total amount of production.
 - Cost comparison
 - Availability of transportation and shipping port
- 4) Feasibility study
- 5) Development and open of a pilot pit
- 6) Production of coal for test firing
- 7) Securing of large consumers and investors
- 8) Mines development including town, railway, roadway, port and utilities.

Some incentives are needed for the development of new coal fields. One of ideas is to introduce the contractor system different from East Kalimantan for the purpose of promoting the development. First stage is the survey and exploration of coal fields by the Governmental organization, and the second stage is the development by private sector including foreign investors.

In other provinces excluding South Sumatra, it is necessary to suggest some ideas regarding the development of coal. As described previously, several coal mining concessions are newly capable of developing in Bengkulu province. However, coal which has been mined is exported to such countries as Malaysia, the Philippines and Bangladesh. Further development requires two policies for exports and domestic use. Regarding the former, major customers require stable supply of coal over a few hundred thousand tons as a contract for a long term under the world coal trade circumstances. Judging from the geological condition of coal fields in Bengkulu, it seems to be difficult to expand widely one mining pit. The scale of one mine is limited so small that systematizing of a coal center or a intensive agency (non-profit organization) are recommended in order to carry out sales efforts and stable supply. As regards the expansion of domestic use of the latter, it is necessary to examine the attraction of cement industry because limestone and coal resources exist near both cities of Bengkulu and Curup.

(2) Energy

According to PLN's investment program (May, 1992), power development plan is revised to meet power demand growth in the region. Power demand can continue to increase with higher growth rate. Power system interconnection using submarine cable between Java and Sumatra is under studying with great interest of many people. It will create a large scale economical effect, and also might be possible to supply electric power on a large scale to Java after 2005 - 2010. Depending on the scope of the Tanjung Enim power plants construction plan, it will be necessary to take into consideration the increase of local demand in the Region and the progress of system network among provinces in Sumatra.

The construction of large scale power plants enables the improvement of efficiency and the power supply of a moderate price, in addition to the advancement of system network and the reliability of power supply. As one of the options, the construction of a few thermal power plants, for example, Muara Bungo (coal fired), Palembang (gas fired) and Bengkulu (coal fired) besides Tanjung Enim and Tarahan, is considered. As described before, system interconnection, Palembang - Tanjung Enim - Tarahan line is under construction. This line is to extend toward Jambi and Java. Muara Bungo thermal power station, if the construction is possible, will be able to supply power to the main artery of power line described above, and to prepare the system interconnection between southern part and northern part of Sumatra. Thermal power stations of Palembang and Bengkulu can respond to the increase of domestic demand. These new power plants can answer for securing the position of power exporter after 2010.

Considering the process that main generating facilities in Indonesia have changed from diesel to gas turbine and to steam turbine, it is recommended to choose gas turbine generators if it is possible. Power supply by gas turbine and gas/steam combined cycle generators is considered to be more efficient than diesel generators, and to be avoidable to result in double or triple facility investment.

(3) Conceptual strategy in the Region

Figure 4.4.1 shows schematic view for energy resources development strategy. Conceptual strategy can be described as follows.

- 1) Expansion of gas utilization in Palembang is due to gas thermal power development.

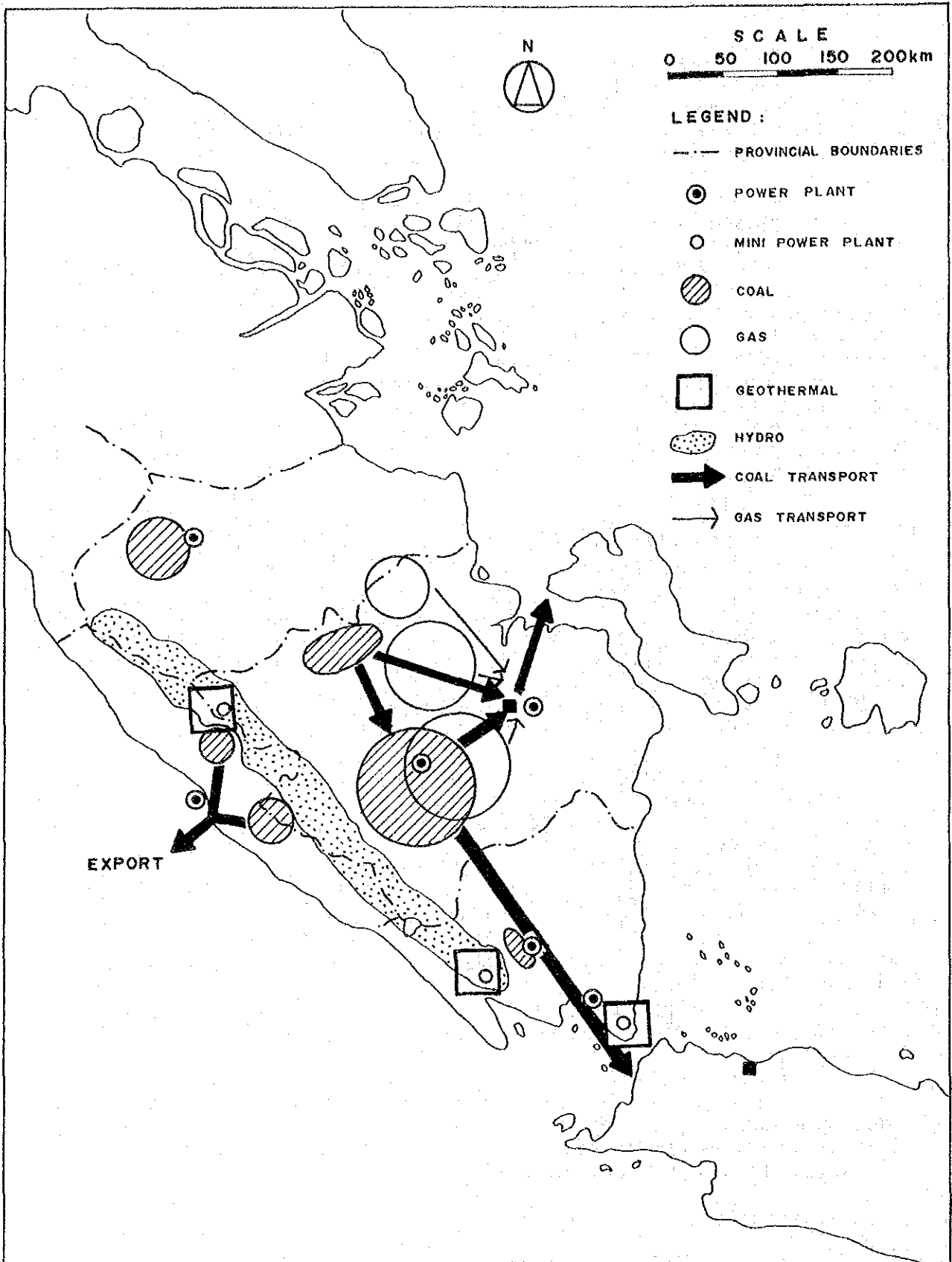


FIGURE 4.4.1 SCHEMATIC VIEW FOR ENERGY RESOURCES DEVELOPMENT

- 2) The coal development around Tanjung Enim and Lahat is positioned on the base of national energy balance.
- 3) Coal development in Bengkulu Province is positioned for export.
- 4) Coal development in Musi Rawas field needs the development of coal haulage system.
- 5) Coal development in Rantan Pandan is due to coal thermal power development at Muarabungo.
- 6) Hydro-power and geothermal development available in the Region is needed.

In order to achieve these targets, the development of coal transportation system is the most important strategy. It is considered that the improvement of Muara Enim - Tarahan railway is key point for the coal development in South Sumatra.

And it is a matter for deep consideration about the railway improvement of Lahat-Muara Enim-Palembang line and a new construction of transportation system from Palembang to an available port.

4.5 IDENTIFIED PROJECTS

The projects listed in long list and issues recommended in previous section are summarized as shown in block diagram below (Figure 4.4.2).

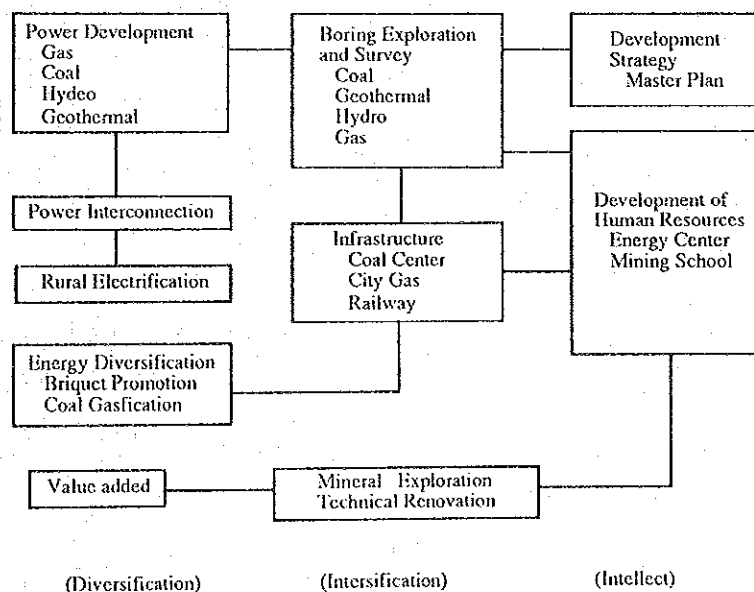


Figure 4.4.2 Block Diagram of Project Formation

South Sumatra can play a role as an energy supply base in Indonesia. As described in previous section, energy demand in Indonesia will increase with high growth rate. Figure 4.4.3 shows the schematic view of commercial and non-commercial energy demand. Figure 4.4.3 also shows the past trends of oil production and oil export.

The objectives of energy policy of Indonesia is to save the adequate supply of oil and gas for export. The share of oil in total commercial energy consumption in 1990/91

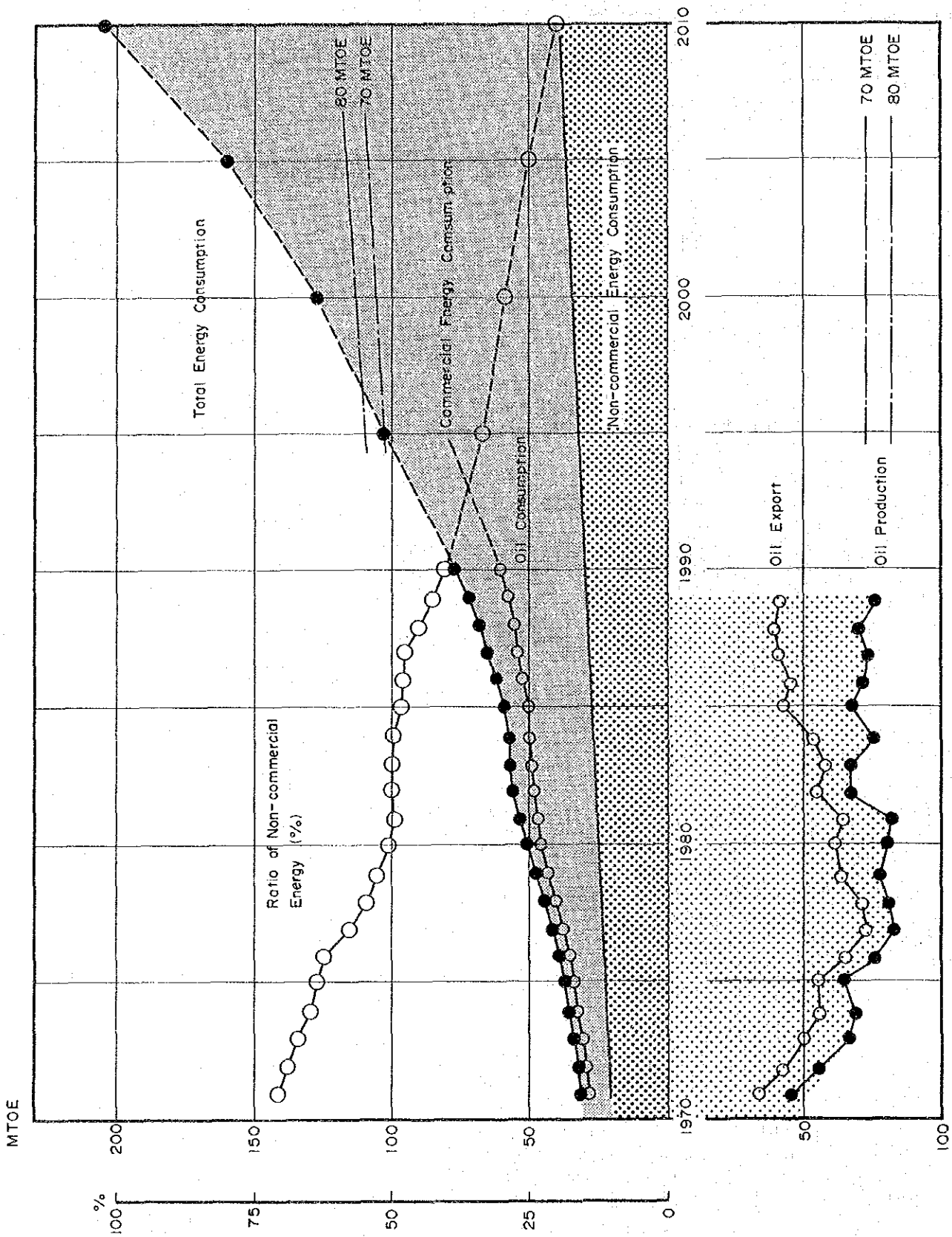


Figure 4.4.3 Schematic View of Energy Demand (Basic Case)

was about 65% (See Table 4.2.3). To keep oil export, it is considered that an aggressive diversification of energy sources is required to reduce oil dependence.

(1) Diversification

First priority for diversification is power development. In long lists (Vol. 4, Part 4), the following power development projects are nominated as high or medium projects.

- Gas-fired thermal power plant (Palembang)
- Mine mouth coal-fired thermal power plant (Tanjung Enim)
- Way Semangka Hydro-power development (Way Semangka)
- Coal-fired thermal power plant (Muara Bungo)
- Coal-fired thermal power plant (Bengkulu)
- Geothermal power development around Ulubelu (Ulubelu)
- Coal-fired thermal power plant (Kotabumi)

And the following measures for diversification of energy sources are considered to save oil export and to supply oil alternative energy for domestic use.

- Briquettes promotion
- Coal gasification for the expansion of coal utilization

(2) Intensification

Regarding coal development, the following projects are nominated. Detailed examination of boring exploration is needed as the first step for coal development at present.

- Master plan for coal development
- Coal development in Muara Tiga Besar and N.W. Banko fields (South Sumatra)
- Boring exploration around Tanjung Enim (South Sumatra)
- Boring exploration in Musi Rawas coal fields (South Sumatra)
- Boring exploration in Rantau Pandan coal fields (Jambi)

Regarding tin mining in Bangka and Belitung, technical renovation and industrial adjustment planning are required to cope with the structural change of tin mining industry and to establish the flexible production system. For the industrial structure change, exploration of rare earth metals associated with the secondary tin deposit is considered to be significant. City gas delivery system in Palembang can be implemented by use of the surplus of natural gas for power demand after the commissioning of Kramasan gas-fired power plant.

Development of human resources is also needed especially for the expansion of coal production. As described before, coal production in the Region can be supposed to be 33-42 million TCE in 2010. It is necessary to train many workers and to educate admirable engineers.

5. TOURISM

5.1 CURRENT CONDITIONS

(1) Tourism in ASEAN Countries and Indonesia

Tourism in ASEAN countries has performed well in these five years comparing with world tourism and even with Asia total. In tourist arrivals, ASEAN countries share 3.4% (1989) of world's with annual growth rate of 17.7% (1986-90). The reason of the better growth of ASEAN countries can be attributed to the region's isolated location from world trouble spot and the existence of stable Japanese market and rising Chinese market they highly rely upon, and they were less affected by recession of major market of Europe and North America.

ASEAN countries can be divided into two groups; leading group, Singapore, Thailand, and Malaysia, and following group, Philippines and Indonesia. Among these countries, Indonesia still stays rather lower level, but its growth is worth of notice. Indonesia's average annual growth rate between 1986 and 1990 marks 27.5% and in 1989-1990, it jumped to the height of 33.9%. Even if there was a benefit of the general tourism boom in the world and particularly in the region, the main factor of this dramatic acceleration can be attributed to change of the government policy. In 1980s, the government gave priority to tourism industries as a leading industry for earning foreign exchange. Some regulations were eased and abolished and tourism developments were encouraged. In 1991, national tourism promotion was performed under the banner of VISIT INDONESIA YEAR 1991. This world-wide promotion ended with satisfactory success (statistical data still not available).

The growth in number of tourist arrivals mainly depends on Indonesia's traditional market, rather than a new market which emerge rapidly. The "big three," Singapore, Japan and Australia, each has share of 23.0%, 11.9% and 8.1%, and in total reaches 43.0%. Among these three, Singapore and Japan shows high growth rate per annum, 20.2% and 28.1%, from 1988 to 1990. Other noted feature is new rising markets. U.S. shows 19.3% growth and Netherlands 22.5%. What is astonishing and exceptional is China, which indicates 194.2% from 1989 to 1990. Also that any annual growth rate of Top 10 Markets do not exceed the total growth rate must be noted, because this clearly shows the diversification of market.

Number of rooms in ASEAN countries showed the annual growth rate of 4.6% and reached 334,870. In total number Indonesia follows Thailand, 148,153 to 105,709, and shares 31.6%. Considering Indonesia's vast expanse of territory and concentration to few major area like Jakarta, Bali, Surabaya, etc. it cannot be said sufficient for the country.

When we pay attention to average length of stay, another character of Indonesian tourism emerges. Comparing with other ASEAN countries, Indonesia and Philippines have much longer stay, 11.5 and 12.04, than other countries only followed by Thailand, 7.63. This tells that Indonesian tourism orients vacation type or caravan type tourism, not touch-and-go package tour type tourism.

Tourism receipt trend from 1985 to 1989 also shows Indonesia's rapid growth, 31.3%. Only that of Thailand, 33.8%, can compete with and tourism expenditure jumped up to US\$ 2,103 million with growth rate of 63.8% from that of 1989 and per tourist expenditure, US\$ 966 is about average. But daily expenditure per tourist is quite low, US\$ 82, less than half of Singapore's.

In 1988, Indonesian Government announced "Broad Outline of State Policy." According to this, target of tourism sector for 1983 was set as follows:

a) International Tourists 1993 : 2.5-3.5 million

b) Foreign Exchange Earning	: US\$ 2.25-3.15 billion
c) Average Length of Stay	: 12-14 days
d) Star Class Hotel Rooms	: 33,011
e) Non-Star Class Hotel Rooms	: 56,981

As seen above, achievements in 1989 and 1990 seems satisfactory and Indonesia will surely win a splendid success in tourism development beyond set target.

(2) Tourism in Indonesia and Southern Sumatra

In August, highest season of tourism, of 1990, Central Bureau of Statistics surveyed foreign tourists staying in stered hotels by 21 provinces/Tourism Destination Areas. Total number of tourists was 179,596. Among these provinces, Bali received the largest number of 51,707 with share of 28.8%. DKI Jakarta and North Sumatra follows Bali with number of 35,493 and 30,471 and share of 19.8% and 17.0%. These provinces are Big Three in Indonesia. According to this survey, in Southern Sumatra, excluding Bengkulu, received only 0.8%, 1,417 tourists.

Tourist arrival, registered tourists foreign and domestic at star-class hotel, of 1990 in Southern Sumatra counted 130,793. This is 2.4% share of national total. This is a figure with 16.6% annual growth from 1986 and indicates 5.0% higher than national average.

Number of foreign tourist grew with a rate of 18.7%, 3.8% lower national's and reached 17,077. While domestic showed bright success with growth rate of 16.3%, 10.2% higher than national's, and counted 130,793. Comparing with national average rate, the Region has quite unique balance, lower foreign and superior domestic.

In travel industry, Southern Sumatra has 41 agent offices and 347 guides. This is quite large number comparing with total number of tourists. In average, each agent office has 3190 and guides has 377 tourist market. National and Northern Sumatra average shows 5,174 and 6,826 for agent office and 1,656 and 5,308 for guides. When compared with this average, it may be clear that Southern Sumatra travel industry has some imbalance even with consideration of local character, depending mainly on long distance tourists.

(3) Tourism Resources in Southern Sumatra

Southern Sumatra four provinces are not yet well recognized among tourists both foreign and domestic. But the Region has many potential tourist destinations with wide range from white sandy beaches to cool crater lakes. All the four provinces are designated as the Tourism Destination Area by Ministry of Tourism, Post and Telecommunication. It is eagerly hoped that the Region's rich and colorful resources are to be widely known and familiar to tourists. Below is a short description of provinces' major tourism resources.

Jambi has two national parks which shows two faces of nature in Southern Sumatra; Kerinci Seblat National Park and Berbak National Park. Kerinci Seblat National Park stretches on Barisan Range, covering area of 1,484,650 ha. Though it lays over four provinces; Jambi, West Sumatra, Bengkulu and South Sumatra, the center of the park is Sungai Penuh town and Kerinci Lake, Jambi. The park boasts various kind of fauna and flora and mountains and lakes which will offer attraction to tourists. Berbak National Park, newly designated in 1992, is located on the eastern coast of the province. Most of 1500,000 ha area of the park is swampy lowland. The park is ideal site for wildlife watching and photo-safari especially numerous kinds of birds.

South Sumatra, in spite of its vast territory, is quite poor in the heart of the province. Its main attractions are in islands, Bangka and Belitung. Both have white sandy beaches and clear blue water. Recently tourism development has just begun and Belitung has "Belitung Tourism Development Corporation" which aims super large scale beach resort at Tanjung Kelayang. Both islands have many potential spots like Pantai Parai, Romodong

beach, Tanjung Binga, Tanjung Kiras, etc. On the mountainous area, there are many "megalith" in Kabupaten Lahat. Bayung Lincir is a destination for adventure oriented young tourists.

Bengkulu is one of the tourism resource-richest provinces in Indonesia. But its remote location prevents tourists to aware of and visit them. The province has one natural resource which they can be proud of to the world, Rafflesia Arnordy, the world biggest and the most curious flower. It blooms only in Sumatran mountains, Bukit Tinggi, Bengkulu and southern Lampung, and Kalimantan. Bengkulu has ten Rafflesia reserves, but because of lack of information, few tourists visit there. Another unique resource is Tabot Festival, performed ten days from the first to the tenth of Muharram on Islamic calendar. This festival is a memorial ceremony of martyrdom of Hasn and Husayn, but the festival is quite cheerful one. It has long been a local festival but these year visited by many tourists from all over Indonesia and the world.

Lampung is the very gateway to Sumatra. It has many attractions which invites tourist from Jakarta market. The most famous is Krakatau and surrounding islands. This can be a symbol of Sumatra tourism development as a declaration of its existence. Way Kambas National Park is another famous tourist destination. Its "Elephant Training Centre" has about 70,000 visitors and recognized as a good weekend picnic site together with Bergen national plantation's agro-tourism.

(4) Tourism Development Corporation

In Indonesia, there are 11 Tourism Corporations which is established and to be established, influenced by the success of Bali Tourism Development Corporation for the Nusa Dua Development with area of 350 ha. They are:

- Biak Irian Tourism Development Corporation
- Manado Minahasa Tourism Development Corporation
- Goa Makasar Tourism Development Corporation
- Lombok Tourism Development Corporation
- Baturaden Tourism Development Corporation
- Pangandaran Tourism Development Corporation
- Belitung Tourism Development Corporation
- Krakatau Tourism Development Corporation
- Bintang Tourism Development Corporation
- Padang Tourism Development Corporation
- Nias Tourism Development Corporation

Main concept of Tourism Development Corporation (TDC) is targeting upon localization and privatization of tourism development. Every TDC is founded by local government and private developers except for Bintang TDC. TDC owns the designated development area and provides necessary infrastructure for tourism-related facilities. TDC leases facility lots to developer and investors and manages the estate.

In the area of Southern Sumatra, there located two TDCs: Krakatau Tourism Development Corporation and Belitung Tourism Development Corporation. Outline of these TDCs areas follows:

Krakatau Tourism Development Corporation

Location	Merak Belantung, Lampung Selatan, Lampung
Access	70 km from Beranti Airport 40 km from Bakauheni Ferry Terminal

Attraction	World famous volcano, Krakatau Way Kambas National Park Sea excursion and beach recreation
Master Plan	
-Development area	300 ha
-No. of hotel lots	5, 4, and 3 stared : 8 lots
-No. of hotel rooms	1,400
-Other facilities	27-hole golf course, a jetty, 140 villas, resort community centre, agro-tourism site
-Project cost	US\$ 17.2 million
Remarks	The development area is located within the weekend tour range from Jakarta. Main feature is weekend resort for Jakarta residents

Belitung Tourism Development Corporation

Location	Tanjung Kelayan, Belitung Island Sumatra Selatan
Access	
Attraction	Marine sports and beach recreation
Master Plan	
-Development area	650 ha
-No. of hotel lots	
-No. of hotel rooms	5 and 4 stared 3,367 3 and 2 stared 1,813
-Other facilities	Three 18-hole golf course, marina
-Project cost	US\$ 80 million
Remarks	Only 1 flight a day from Jakarta is the biggest constraint

(5) Tourism Development Potential

Tourism development potential and benefit of Southern Sumatra can be summarized as below:

- 1) Location
 - Lampung and Islands of Lampung Bay and Sunda Strait are within one-day trip distance from Jakarta market
 - Expected multiplier effects with West Java and West Sumatra
 - Singapore, Malaysia and Batam is in the possible field of market
- 2) Diversity
 - Highland resort co-existing with marine resort
 - Lowland crocodile to mountain monkey
 - Ancient Sriwijaya Empire to modern city
 - 300 years old festival to modern resort festival
 - Vast main-land to islands

Potential area can be chosen with reasons of:

- 1) High and unique attraction area

- 2) Accessibility from big market
- 3) Area which can offer high graded service

As shown above, Southern Sumatra has high potentiality still undeveloped. It must be noted, however, that tourism resources of Southern Sumatra is orienting to nature resources. Thus, harmonizing with natural environment and lessen development impact shall be main theme of tourism development of the Region with taking its most advantage of its location.

Table 5.1.1 Tourist Arrival of ASEAN Countries (Thousands)

	1986	1987	% C.	1988	% C.	1989	% C.	1990	% C.
INO	825	1,050	27.3	1,301	23.9	1,626	25.0	2,178	33.9
MAL*	3,027	3,146	3.9	3,374	7.2	4,553	34.9	7,079	55.5
PHL	782	795	1.7	1,043	31.3	1,190	14.1	1,024	-13.9
SIN	3,191	3,679	15.3	4,186	13.8	4,830	15.4	5,323	10.2
TAI	2,818	3,483	23.6	4,231	21.5	4,810	13.7	5,299	10.2
TOTAL	8,670	10,152	17.1	12,000	18.2	14,093	17.4	16,661	18.2

INO:Indonesia, MAL: Malaysia, PHL:Philippines, SIN:Singapore, TAI:Thailand

Source :PATA Annual Statistical Report 1990

* : WTO

Table 5.1.2 Tourism Market of Indonesia

	1988	Share	1989	Share	1990	Share	Ann % C
SIN	347,493	26.7	483,703	29.7	501,713	23.0	20.2
JPN	157,929	12.1	186,521	11.5	259,039	11.9	28.1
AUS	147,836	11.4	178,456	11.0	175,895	8.1	9.1
MAL	105,460	8.1	131,146	8.1	141,459	6.5	15.8
CHN	--	--	39,840	2.4	117,198	5.4	194.2
USA	67,061	5.1	80,196	4.9	95,456	4.4	19.3
NET	59,624	4.6	70,224	4.3	89,419	4.1	22.5
UKD	62,068	4.8	74,617	4.6	80,709	3.7	14.0
GER	58,981	4.5	70,362	4.3	80,667	3.7	16.9
FRA	38,134	2.9	45,277	2.8	50,774	2.3	15.4
TOTAL	1,301,049	100	1,625,965	100	2,177,565	100	29.4

Source : PATA Annual Statistical Report 1990

Table 5.1.3 Average Length of Stay in ASEAN Countries (Nights)

	1985	1986	1987	1988	1989
INO	12.71	12.70	12.70	11.55	n.a.
MAL	4.50	4.50	4.50	4.50	4.60
PHL	9.08	8.95	8.91	12.06	12.04
SIN	3.50	3.50	3.40	3.40	3.32
TAI	5.60	5.90	6.10	7.36	7.63

Source : WTO

Table 5.1.4 Tourism Receipts in ASEAN Countries (US\$ Million)

	1985	1986	1987	1988	1989	Ann % C
INO	548	647	924	1,283	1,628	31.3
MAL	622	648	714	766	839	7.8
PHL	994	1,006	1,029	1,301	1,465	10.2
SIN	1,660	1,767	2,088	2,399	2,907	15.0
TAI	1,171	1,421	1,947	3,120	3,754	33.8
TOTAL	4,995	5,489	6,702	8,869	10,593	20.7

Source : WTO

Table 5.1.5 Tourism Expenditures in ASEAN Countries (US\$)

	Total (Thousands)		Average Expenditure per Tourist		Average Daily Expenditure	
	1989	1990	1989	1990	1989	1990
	INO	1,284,000	2,103,503	--	966	--
MAL	--	--	386	--	104	--
PHL	1,465,000	1,306,190	1,367	1,369	114	114
SIN	2,466,009	3,492,759	465	706	153	180
TAI	3,753,332	4,312,780	--	813	--	115

Source : PATA Annual Statistical Report 1990

Table 5.1.6 Number of Rooms in ASEAN Countries

	1985	1986	1987	1988	1989	Ann % C
INO	97,136	102,642	104,084	103,430	105,709	2.1
MAL	35,720	38,178	38,178	40,490	43,149	4.8
PHL	16,483	15,584	15,094	17,640	13,911	-4.2
SIN	20,547	23,666	24,921	26,110	23,948	3.9
TAI	110,003	116,997	124,139	135,962	148,153	7.7
TOTAL	279,889	297,067	306,416	323,632	334,870	4.6

Source : WTO

Table 5.1.7 Classified Tourism Resources in Southern Sumatra

	Jambi	S.Sumatra	Bengkulu	Lampung	Total
Tourist Park	3				3
Cave	2	1	1	5	9
Beach		6	5		11
Waterfall	3			1	4
Hot Springs	2		2		4
Sea Garden					
National Park		1		2	3
Mountain					
Hunting Ground		2	3		5
Lake	3		5	1	9
Zoo	1				1
Total	14	10	16	9	49

Source : Tourism in Indonesia, 1990 DGP

Table 5.1.8 Tourism Resources in Southern Part of Sumatra

	Name of Resource	Location	Attraction
JAMBI			
1	Jambi	Jambi	-Museum -Orchid Park -Aneka Ria Forest Park -Mayang Mengurai Park -Candi Muara Jambi
2	Tiangko	Bangko	-Cave
3	Batang Asai	Bangko	-Rapid -Beautiful Landscape -National Boat Race
4	Bukit Dua Belas		-Tropical Forest -Kubu People
5	Segerincin	Bangko	-Waterfall
6	Berbak National Park	Tanjung Jabung	-145,000 ha National Park -Tropical forest & Swamp -Tropical Fauna & Flora
7	Kerinci Seblat National Park	Kerinci	-Danau Kerinci Lake View -Danau Gunung Lake View & Camping Site -Telun Berasap Waterfall -Kayo Aro Tea Plantation -Semrup Hot Spring -Sungai Penuh Masjid Jame
SOUTH SUMATRA			
8	Palembang	Palembang	-Rumah Bari Museum -Ahmad Najimuddin Museum -Rumah Hasim Ninh -Benteng -Klenteng Kwa Sam Temple -Ampera Bridge -Pasar 16 Ilir
9	Bayung Lincir	Musi Banyuasin	-Tropical Forest -Tropical Fauna & Flora -Kubu People
10	Pulau Bangka	Bangka	-3 km long Matras Beach with White Sand and Clear Water -Parai Beach with Excellent View -Remandong Beach -Wisma Ranggan Soekarno's House -Pemali Hot Spring -Pemali Tin Mine
11	Pulau Belitung	Belitung	-Mount Menumbing Dutch Guest House -Tanjung Tinggi Beach -Tanjung Kelayang Beach -Tanjung Binga Beach -Tanjung Kiras Beach -Teluk Gembira Beach -Bulung Mandi Beach -Mangar Beach -Badau Museum

BENGKULU			
12	Bengkulu	Bengkulu	-Pantai Panjang Nala Beach -Taman Laut Pulau Tikue -Pantai Pasir Putih Pulau Baai -Danau Dendam Tak Sudah -Kerajinan Kain Besrek -Taman Ria Remaja -Rumah Peninggalam -Bunung Karno -Bengkulu Museum -Benteng Malraborg -Makan Sencotot Ali Basyah -Kampung Cina -Monument Parr & Hamilton -Benteng York
13	Muko-muko	Bengkulu U.	-Pantai Mukomuko -Benteng Anna
14	Lubuk Pinang	Bengkulu U.	-Bendungan Air Manjuntio
15	Medan Jaya	Bengkulu U.	-Pantai Air Rami
16	Kotabani	Bengkulu U.	-Gua Gedung
17	Gua Mulan	Bengkulu U.	
18	Air Terjun Timbulun	Bengkulu U.	-Waterfall
19	Gunung Selan	Bengkulu U.	
20	Bendang Kenuu	Bengkulu U.	
21	Lais	Bengkulu U.	-Pantai Lais -Air Lais Hot Spring
22	Air Gading	Bengkulu U.	-Hot Spring
23	Danau Gedang Dusun	Bengkulu U.	-Lake
24	Taba PenanJang	Bengkulu U.	-Rafflesia Reserve
25	Taman Bukit Kubu	Bengkulu U.	-National Park
26	Taman Kebun Raya & Bunga	Bengkulu U.	
27	Suban Air Panas	Rejang Lebong	-Hot Spring
28	Tabarenah	Rejang Lebong	
29	Penatang Danau	Rejang Lebong	
30	Bukit Koba	Rejang Lebong	
31	Cagar Alam Pagar Gunung	Rejang Lebong	
32	Hutan Wisata Bukit Daun	Rejang Lebong	
33	Kepala Curup	Rejang Lebong	-Waterfall
34	Danau Tes	Rejang Lebong	-Lake-side Resort
35	Danau Liang	Rejang Lebong	
36	Bukit Semelako	Rejang Lebong	
37	Air Putih	Rejang Lebong	-Hot Spring
38	Air Seluma	Bengkulu S.	-Hot Spring
39	Cagar Alam Lubuk Tapi	Bengkulu S.	
40	Pantai Indah Manna	Bengkulu S.	-Beach
41	Gua Sarang Burung	Bengkulu S.	
42	Kuala Padang Guci	Bengkulu S.	
43	Pantai Linau	Bengkulu S.	-Beach
44	Pantai Way Hawang	Bengkulu S.	-Beach
45	Taman Nasional Kuar Timur	Bengkulu S.	-National Park
46	Air Tarjung Nunung	Bengkulu S.	-Water
LAMPUNG			
47	Merak Belantung	Lampung S.	-Tourism Complex -White sandy beach -Clear water sea
48	Sitiga Island	Lampung S.	-Island of bats
49	Rajabasa Mt.	Lampung S.	-Natural Forest -Hot spring
50	Wartawan	Lampung S.	-White sandy beach
51	Tahura	Lampung S.	-Scenic hill
52	Condong Island	Lampung S.	-White sandy beach

53	Tegal Island	Lampung S.	-White sandy beach -Pearl breeding
54	Bergen	Lampung S.	-Rubber and oil plantation
55	Pugung Raharjo	Lampung S.	-Archaeological Park
56	Wana	Lampung S.	-Traditional architecture
57	Goa Maria	Lampung S.	-Religious holy place
58	Way Lalan	Lampung S.	-Waterfall
59	Way Kambas	Lampung T.	-Elephant training centre -Jungle cruise -Elephant safari -Tropical fauna and flora
60	Blambangan	Lampung T.	-Tapis handicraft
61	Way Rarem	Lampung T.	-Dam
62	Kebon Tebu	Lampung T.	-Archaeological site
63	Kenali	Lampung T.	-Traditional architecture
64	Ranau	Lampung B.	-Lakeside resort -Hot spring -Mountain climbing -Tabacco plantation

Table 5.1.9 Foreign and Domestic Tourist Arrivals

Province	1985		1986		1987	
	Foreign	Domestic	Foreign	Domestic	Foreign	Domestic
Jambi	--	--	--	--	395	70,580
S. Sumatra	7,656	69,934	7,367	80,133	7,367	90,326
Bengkulu	575	60,288	591	67,322	595	67,828
Lampung	2,297	97,113	2,403	91,818	1,815	103,516
Total	10,008	227,335	10,361	239,273	10,172	332,250

Province	1988		1989		1990	
	Foreign	Domestic	Foreign	Domestic	Foreign	Domestic
Jamb	1,014	87,225	321	121,104	--	--
S. Sumatra	11,462	99,355	15,875	137,607	--	--
Bengkulu	1,044	62,824	1,506	64,667	4,800	68,219
Lampung	1,932	102,233	3,327	97,429	3,744	106,149
Total	5,452	262,217	21,029	420,807	8,544	174,368

Source : Provincial; BPSs

Table 5.1.10 Accommodation Facility in Southern Sumatra, 1989

a) Jambi

Number of	Star Hotel	Non-star Hotel	Total
Hotels	5	57	62
Rooms	149	1,104	1,253
Room-Night	18,230	153,736	171,966
Occupancy Rate	33.53	38.18	37.62
Guests			
a. Total	13,234	64,782	78,016
b. Foreign	114	393	507
c. Domestic	13,120	64,389	77,509
Length of Stay			
a. Total	2.6	4.3	
b. Foreign	8.8	20.5	
c. Domestic	2.5	4.2	

b) South Sumatra

Number of	Star Hotel	Non-star Hotel	Total
Hotels	14	137	151
Rooms	681	2,443	3,124
Room-Night	89,329	241,842	331,171
Occupancy Rate	36.47	27.12	29.13
Guests			
a. Total	88,458	145,310	233,768
b. Foreign	7,462	672	8,134
c. Domestic	80,966	144,638	225,604
Length of Stay			
a. Total	2.0	2.5	
b. Foreign	2.8	5.6	
c. Domestic	1.9	2.5	

c) Bengkulu

Number of	Star Hotel	Non-star Hotel	Total
Hotels	4	37	41
Rooms	99	752	851
Room-Night	15,356	89,231	104,587
Occupancy Rate	45.98	32.53	37.26
Guests			
a. Total	9,608	35,158	44,766
b. Foreign	1,046	47	1,093
c. Domestic	8,562	35,111	43,673
Length of Stay			
a. Total	3.1	4.2	
b. Foreign	3.0	8.1	
c. Domestic	3.2	4.2	

d) Lampung

Number of	Star Hotel	Non-star Hotel	Total
Hotels	3	69	72
Rooms	189	1,600	1,789
Room-Night	25,746	119,399	145,145
Occupancy Rate	46.58	32.19	34.05
Guests			
a. Total	25,665	107,691	133,356
b. Foreign	2,167	573	2,740
c. Domestic	23,488	107,118	130,606
Length of Stay			
a. Total	1.9	1.7	
b. Foreign	2.9	8.5	
c. Domestic	1.8	1.7	

Source : Occupancy Rate of Hotel Rooms, 1989 ; BPS

Table 5.1.11 Tourism Industry in Southern Sumatra

	GTB	BGTB	TA	Total	TL	Guides
Jambi	3	1	4	8	-	58
S.Sumatra	10	6	11	27	1	31
Bengkulu	3	-	1	4	10	31
Lampung	2	-	-	2	25	55
Southern Sumatra	18	7	16	41	54	347
Northern Sumatra	76	32	28	136	36	175
Jakarta	180	97	41	318	193	333
Bali	81	32	-	113	32	1,046
Indonesia	576	275	201	1,052	551	3,288

GTB : General Travel Bureau, BGTB : Branch General Travel Bureau, TA : Travel Agent, TL : Tour Leader

Source : DGT

Table 5.1.12 Programme of Major Festivals

1. Tabot Festival, 1992

Date: 2-11 July, 1992
Place: Bengkulu City, Bengkulu

Date	Program
2 Jul.	-Opening of Tabot Festival -Tourism Related Industry Products Exhibition -Dol Music Competition
3 Jul.	-Procession of the Youngs -Fish-Art Competition
4 Jul.	-Night of Charity Performance of Safari Archipelago Culture
5 Jul.	-Decorated Horse-Cart Competition
6 Jul.	-Receiving of IMBI Rally Teams at Guest-House -Drum-Band Competition
7 Jul.	-Local Native Art, Telong-Telong and Barong Landong, Competition
8 Jul.	-Traditional Dance Competition
9 Jul.	-100 km Bicycle Race, Pematang Danau-Rejang Lebong -Dol Music Competition
10 Jul.	-Tabot 10 km -Amusement Show with Tabots
11 Jul.	-Tabot Competition Final Announcement -Closing of Festival -Final procession of Tabots

2. Sriwijaya Festival, 1991

Date: 15-17 August, 1991
Place: Palembang

Date	Program
15 Aug.	-Tourism Expo -Traditional Dance Festival -"Face of Indonesia" Photo Exhibition -Food Festival
16 Aug.	-Palm Climbing Competition -Kite Festival -Various Traditional Games -Miss Sriwijaya Pageant -Traditional Wedding Ceremony
17 Aug.	-Independence Day Ceremony -National Parade -Boat and Art Carnival -Regional Culture Performance -Floating Opera

3. Krakatau Festival, 1992

Date: 12-15 July, 1992
Place: Bandar Lampung, Kalianda

Date	Program
12 Jul.	-Krakatau 10 km Marathon
12-15 Jul.	-Krakatau Cross-Country -Archipelago Culture Exhibition -Local Handicraft Exhibition

5.2 DEVELOPMENT CONCEPT, ISSUES AND STRATEGY

(1) Issues

Major issues, considering above discussed future perspective, can be summarized as follows:

- 1) Infrastructure improvement for tourism industry;
- 2) Conservation of natural and cultural resources;
- 3) Fostering local cultural heritage;
- 4) Establishment of local identity;
- 5) Incentives for private investment;
- 6) Development of local human resources;
- 7) Public promotion and encouragement; and
- 8) Tourism information supply system establishment.

(2) Strategy

Issues shown above may be answered with questions and answers below.

-How Can We Mobilize Our Guests ?

- Continuing development of air, water and land transportation
- Concentrated development of primary route to destination
- Finding possible circuit and option development

-How Can We Be Attractive ?

- Conservation of property present, nature and culture
- Making tourists to be aware of diversity of attraction
- Development of facilities matching to guest's requirement
- Creating favorable atmosphere for investor

-How Can We Contribute Regional Development ?

- Self-generation of employment opportunity
- Sharing benefit of development

-How Can We Appear as What We Are ?

- Preparing and giving adequate information
- Rearranging institutional system to cooperate

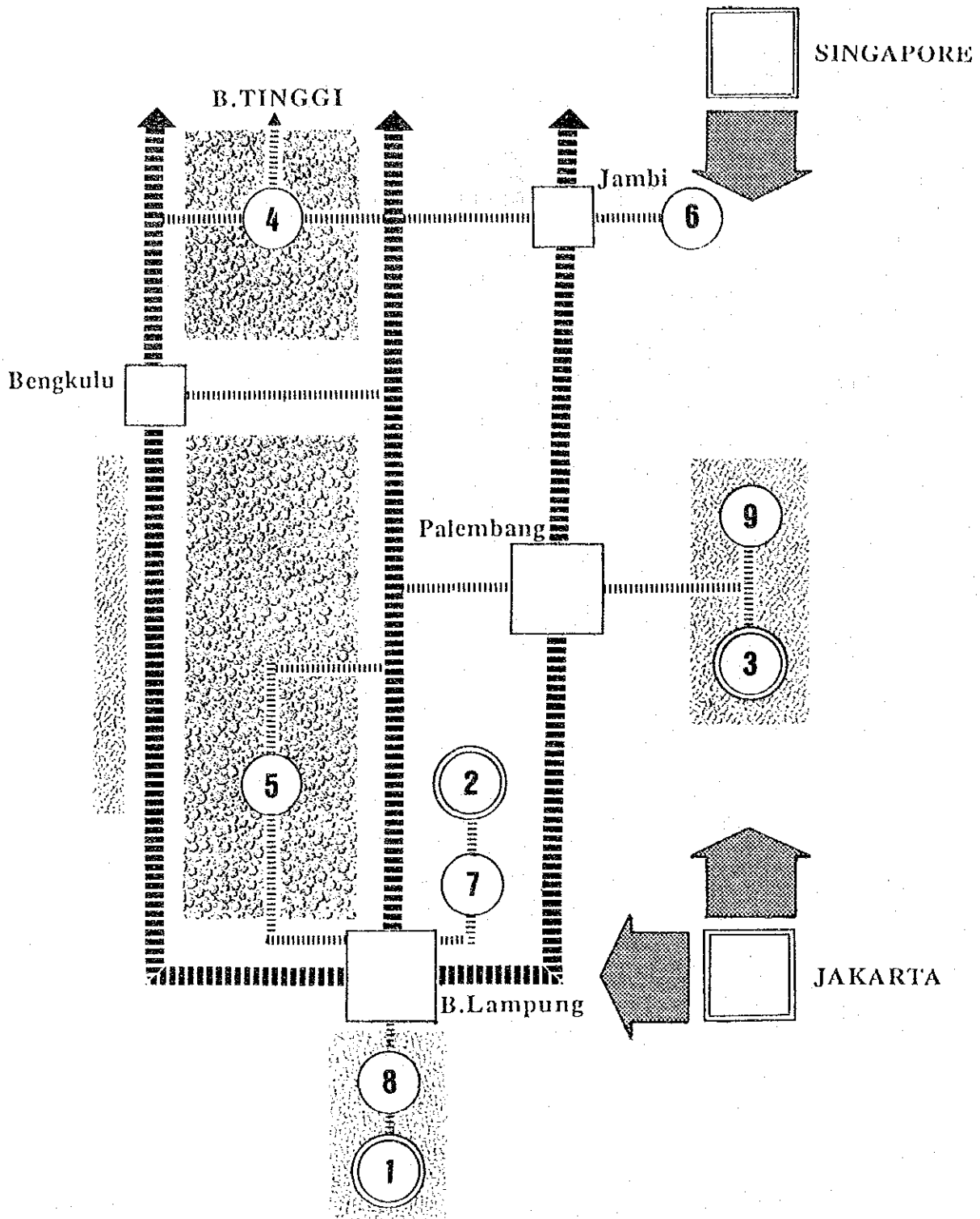
-How Can We Establish Our Identity ?

- Finding and designing "the Flag"

5.3 FORMULATION OF PROJECTS

Guiding considerations of tourism sector adopted in formulating the recommended projects listed on the long list are:

- 1) Most utilize of natural/cultural given resources of the region;
- 2) Establishment of tourism as a leading industry;
- 3) Establishment of local identity through tourism activity;
- 4) Supply of qualified activities and recreation to habitants;
- 5) Recognition of tourism as a powerful tool of social education; and
- 6) Guarantee of sustainable development.



- 1 Krakatau Tourism Devt.
- 2 Way Kambas Tourism Devt.
- 3 Belitung Isla. Integrated Tourism Devt.
- 4 Kerinci Lake Integrated Tourism Devt.
- 5 Ranau Lake Integrated Tourism Devt.
- 6 Berbak Tourism Devt.
- 7 Agro-Tourism Devt.
- 8 Merak Belantung Devt.
- 9 Bangka Isla. Integrated Tourism Devt.




-  Highland Tourism
-  Marine Tourism
-  Agro-Tourism

Figure 5.3.1 Structure of Tourism Development and Layout of Major Projects

6. WATER RESOURCES

6.1 CURRENT CONDITIONS

6.1.1 Hydrology

Reflecting the climate of tropical monsoon, the southern part of Sumatra is endowed with abundant water resources. A mean annual rainfall of the Region is estimated to 2,800 mm, based on the arithmetic mean of the observation record of 115 rain gauge stations located in and around the Region. The Region can be divided into 91 watersheds, from 110 km² of Way Pintan River Basin to 49,100 km² of Batang Hari River Basin. Current water withdrawal activities are mainly found in the small river basins or the upstream tributaries of the major river basins due to accessibility to the surface water.

Figure 6.1.1 shows hydrological observation network system together with isohyetal map in the Region, consisting of 175 river gauges, 115 rain gauges and 14 meteorological stations. The details are compiled in Volume 5, Technical Appendix. Abundant rainfall was observed in the northern part of Bukit Barisan Range, more than 4,000 mm per annum. On the other hand, annual rainfall on eastern coast of the Region in South Sumatra and Lampung Provinces have less than 2,000 mm. Observation of river flow is carried out on 29 river basins, however, the record is relatively short to reveal the availability of water particularly in Bengkulu and Jambi Provinces. In addition, it was found that the accuracy of estimated rainfall is still insufficient particularly in Bukit Barisan Range due to lack of rain gauge stations. It is required to install new river gauges to assess water usage especially in three Kabupatens, Lampung Barat, Bangka and Belitung.

6.1.2 Water Supply

There are three kinds of programs for expansion of water supply system in Indonesia, "Basic Needs Approach" (BNA System), "Ibu Kota Kecamatan" (IKK System), and Rural Water Supply System. BNA designs mainly for major cities with 60 l/head/day of treatment and distribution capacity, on the other hand, water supply for medium and small towns is depended on IKK system with the design criteria of 45 l/head/day. Rural water supply is mainly depended on public water tanks, which are generally settled for 10 to 20 families per one tank. The problems are found that the consumers tend not to be accompany the treated water with chemical smells, and also inadequate water tariff system for rural water supply.

Table 6.1.1 summarizes present condition of water supply in the Region, showing 7.8% of the residents are provided potable water through pipes and public taps. Though the investment priority are put on the area having higher population density, remarkable lower service ratio was found in Lampung Province, with 2.0% of service ratio to the provincial population. Three major problems, that is, insufficient water supply service ratio, high leakage of distribution network, and inadequate water quality are revealed. Expansion and improvement should continue to satisfy domestic water demand in future. The leakage of treated water from the distribution pipelines, estimated between 30% and 50%, is also a serious problem for effective water supply. It is reported that an inadequate replacement period of pipes is one of the cause to the leakage. Review of material applied and strengthening of maintenance system are required to solve the problems.

6.1.3 Flood and Sedimentation

Although flood or inundation area can be seen everywhere in low land of the Region, as shown in Figure 6.1.2, the damage generally seems to be low. Reflecting to the long-term experience of regular overflow, the residential houses are traditionally designed higher floor type, and the wooden canoes are prepared as the transportation measure in the

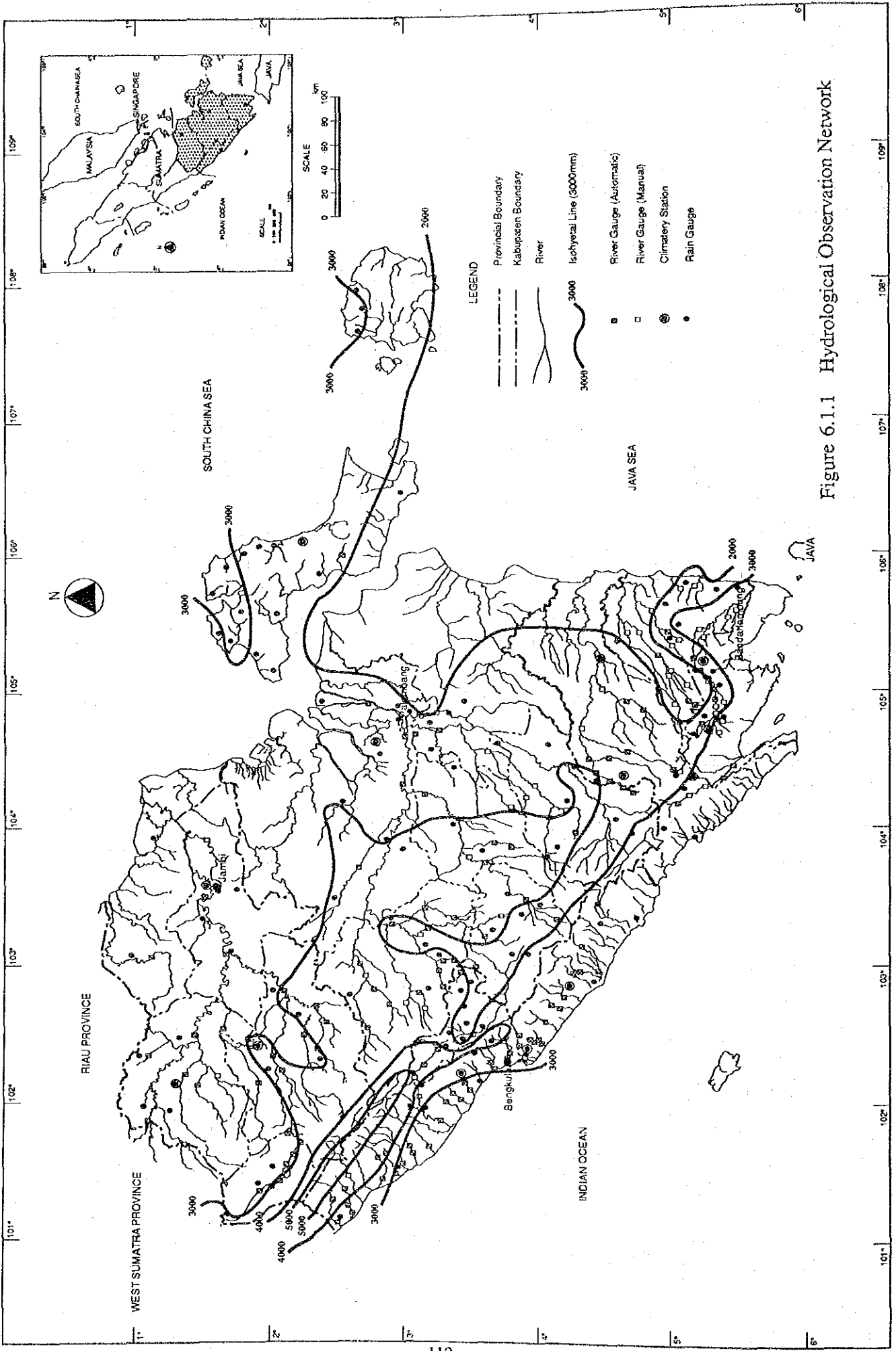


Figure 6.1.1 Hydrological Observation Network