

their productive years and should be replaced by young ones through a systematic replanting program.

2.3.3 Livestock

Animal husbandry is widely practiced in the study region, but usually on a small scale. Buffaloes, horses, goats, sheep, chickens and ducks are the major livestock. However pigs are not recorded at all in the livestock population statistics. It may reflect the dominance of Moslems in the region. Buffaloes are kept for draught work (land preparation), for security in times of financial needs and for milk source. Horses are mainly for the transportation purpose. Goats and sheep are grown for cash source through their sales in the local markets. Chickens and ducks are major sources of protein, eggs and meat, and sold to the market when cash is needed.

Table I(A)-33 shows the population of livestock, the number of the slaughtered, meat production and other products. The number of cows, especially milk cows are very small in the study region. In accordance with the enhancement of income, the demand for milk is increasing around Cilegon. But the number of milk cows is far from self-sufficiency. The ratio of buffalo and horse population in the study region to that of West Java Province reached 21.4% and 22.2% respectively, and the ratio of goats and chickens is relatively high in 1984/85. As for big stocks, buffaloes are the main livestock in meat and skin/hide production. Since raw skin/hide is one of the most scarce materials throughout the world, a planned slaughter program should be made in the study region. Most of eggs are locally consumed. A number of production of eggs and broilers are made on a large scale in the two Kabupatens surrounding Jakarta of Bogor and Tengenka. That makes difficult to develop the market in Jakarta at present.

Table I(A)-33 LIVESTOCK/POULTRY POPULATION AND PRODUCTION
IN THE STUDY REGION AND WEST JAVA IN 1984/85

	Serang (A)	Pandeglang (B)	Study Area (C)	West Java (D)	(C)/(D) x 100
Population					
Cow	255	130	385	189,842	0.20
Milkcow	59	17	76	50,009	0.15
Buffalo	57,771	41,897	99,668	465,256	21.42
Horse	2,681	455	3,136	14,139	22.18
Goat	49,159	126,040	175,199	1,072,795	16.33
Sheep	32,180	111,964	144,144	1,888,881	7.63
Pig	-	-	-	32,958	-
Chicken	712,102	1,491,981	2,204,083	19,330,399	11.40
Layer	12,120	2,940	15,060	8,076,440	0.19
Broiler	25,400	-	25,400	4,119,876	0.62
Duck	124,560	49,035	173,595	2,432,691	7.14
Number Slaughtered					
Cow	809	-	809	129,068	0.63
Buffalo	4,180	2,452	6,632	56,504	11.74
Goat	5,069	950	6,019	84,870	7.09
Sheep	4,630	-	4,630	181,834	2.55
Pig	-	-	-	27,891	-
Meat Production (ton)					
Cow	-	145	145	23,270	0.62
Buffalo	941	552	1,493	12,879	11.59
Goat	425	79	504	7,105	7.09
Sheep	424	-	424	16,638	2.55
Pig	-	-	-	6,247	-
Chicken	591	1,238	1,829	16,049	11.40
Layer	31	2	33	10,123	0.33
Duck	52	20	72	1,010	7.13
Other Products					
Skin/Hide (Sheet)					
Cow	849	-	849	135,522	0.63
Buffalo	5,598	2,697	8,295	62,939	13.18
Goat	25,345	4,750	30,095	424,200	7.09
Sheep	27,780	-	27,780	1,091,004	2.55
Milk (1,000 lit.)	99	35	134	83,654	0.16
Egg (1,000)					
Layer	14,555	353	1,808	969,657	0.19
Broiler	7,748	16,234	23,982	210,334	11.40
Duck	11,061	4,359	15,420	216,035	7.14

Source: Jawa Barat Dalam Angka 1984.

Animal husbandry is most widely practiced in the southern two Kecamatan of Cigeulis and Cimanggu. Tables I(A)-34 and I(A)-35 show the companies, producers and facilities concerning livestock. They are located in Kecamatan near the markets of Serang, Cilegon, Merak, Pandeglang and Jakarta.

2.3.4 Fishery

Since the study region faces the Java Sea, Sunda Straits and Indian Ocean, fishery plays an important role in the economy of the region. Table I(A)-36 shows the number of fishery households, fishery production, number of boats and area in inland fishery in the study region and West Java Province. The number of marine fishery households was 3,561 or 22.2% of the total in West Java Province in 1984, which implies that the study region is one of the major marine fishery centers in West Java Province. However, the boats used for marine fishery in the study region are relatively small. Marine fishery, therefore, means inshore fishery, especially in Kab. Pandeglang. The position of inland fishery households in the region are relatively small in West Java Province, but the number of households which are engaged in inland fishery in brackish water ponds in Kab. Serang corresponded to 8.2% of that of West Java Province in 1984. The main fishery activities in Kab. Serang are seen in inland fishery, especially in brackish water ponds, while marine fishery is significant in Kab. Pandeglang. Fishery production in the study region amounted to 31,861 tons in 1984, comprising 27,014 tons in sea fishery and 4,847 tons in inland fishery. The share of the total production in the study region was 9.4% of the total in West Java Province.

Table I(A)-34 LIVESTOCK INDUSTRIES IN KABUPATEN SERANG, 1986

Name of Company/Producer	Location	Activity/Production
1) Cattle Slaughter		
(1) Operation Unit of Livestock Agency (UPTD: Unit Pelaksana Teknis Dinas Pternakan)	Serang	10-12 animals/day (10 buffaloes/2 cows)
(2) Operaiton Unit of Livestock Agency (UPTD: Unit Pelaksana Teknis Dinas Pternakan)	Cilegon	3-4 animals/day (3 buffaloes/1 cow)
2)-1 Poultry (Broiler)		
(1) Baniel Utama (H. M. Saleh)	Kasemen	375-750/week
(2) Banjarraya Farm (Budianto)	Serang	375-750/week
(3) PD. Marga Jaya Unggas (Sutamin)	Walantaka	375-750/week
(4) M. A. Dimiyati B. A.	Pulomerak	375-750/week
(5) M. Anim	Cikande	375-750/week
2)-2 Poultry (Eggs)		
(1) Moh. Ukon Syafei	Kasemen	2,000-2,500/day
(2) H. M. Slaeh	Kasemen	less than 1,000/day
(3) Mulyoto	Cikeusal	less than 1,000/day
(4) Hilmi Abdul Aziz	Serang	less than 1,000/day
(5) Oka Suryadi	Cikeusal	200/day
(6) Imam Nawawi	Serang	100/day
(7) Sutiari Basuki	Serang	100/day
(8) H. Suhli	Kramatwatu	100/day
3) Milk Cow		
(1) H. Syukur	Serang	50 lit/day
(2) Koperasi Baladika	Taktakan	85 lit/day
(3) KUD Baros	Baros	35 lit/day
4) Insemination Post for Buffaloes		
(1) Farmer Group (30-35 farmers)	Walantaka	
(2) Farmer Group (30-35 farmers)	Walantaka	
(3) Farmer Group (30-35 farmers)	Cikande	
(4) Farmer Group (30-35 farmers)	Cikande	
5) Veterinary Post		
(1) Livestock Service Office Cabang Dinas Pternakan	Every Kecamatan	
6) Animal Breeding Center		
(1) Pt. Phokphand	Kopo	Chicken meat and egg 16,000 chickens/day

Source: Cabang Dinas Pternakan Kabupaten Serang.

Table I(A)-35 LIVESTOCK INDUSTRIES IN KABUPATEN PANDEGLANG, 1986

Name of Company/Producer	Location	Activity/Production
1) Cattle Slaughter		
(1) Rumah Potong Hewan (RPH) Pandeglang Dikelola Dinas Peternakan	Pandeglang	60 buffaloes/month
(2) RPH Menes Dikelola Dinas Peternakan	Menes	30 buffaloes/month
(3) RPH Labuan Dikelola Dinas Peternakan	Labuan	20 buffaloes/month
(4) RPH Cipeucang Dikelola Dinas Peternakan	Cimanuk	4 buffaloes/month
2)-1 Poultry (Broiler)		
(1) CV. Gemilang Pasar (H. Iding)	Pandeglang	600/week
(2) H. Amin (Plasma)	Cimanuk	400/week
(3) H. Fatoni (Plasma)	Menes	200/week
(4) Jali (Plasma)	Cimanuk	200/week
(5) Sarkiman	Cimanuk	200/week
2)-2 Poultry (Eggs)	Nil	
3) Milk Cow		
(1) KUD Pandeglang (12 cows)	Cadasari	
4) Insemination Post for Buffaloes		
(1)	Cadasari	Buffalo
(2)	Pandeglang	Buffalo
(3)	Cigeulis	Buffalo
(4)	Cigeulis	Cow
(5)	Panimbang	Cow
5) Veterinary Post		
(1) Livestock Service Office Cabang Dinas Peternakan	Every Kecamatan	

Source: Cabang Dinas Peternakan Kabupaten Pandeglang.

Table I(A)-36 NUMBER OF FISHERY HOUSEHOLDS, PRODUCTION, BOATS AND AREA IN THE STUDY REGION AND WEST JAVA IN 1984

	Serang Pandeglang Study Area West Java				(C)/(D)
	(A)	(B)	(C)	(D)	x 100
No. of Households					
Marine Fishery	2,793	768	3,561	16,009	22.24
No Boat	-	-	-	1,018	-
Non-Powered Boat	-	-	-	601	-
Small Boat	1,333	29	1,362	2,599	52.40
Medium Boat	85	7	92	2,831	3.25
Large Boat	-	-	-	223	-
Out-Board Motor Boat	1,248	698	1,946	8,416	23.12
In-Board Motor Boat	127	34	161	321	50.16
Inland Fishery	2,555	3,943	6,498	206,542	3.15
Blackish Water Pond	1,217	-	1,217	14,850	8.20
Fresh Water Pond	774	1,912	2,686	131,155	2.05
Cage	-	-	-	1,103	-
Paddy Field	554	2,027	2,571	58,641	4.38
Running Water	10	4	14	793	1.77
Total	5,348	4,711	10,059	222,551	4.52
Production (ton)					
Marine Fishery	7,953.0	19,061.1	27,014.1	226,287.0	11.94
Inland Fishery	3,782.8	1,064.1	4,846.9	112,667.0	4.30
Blackish Water Pond	3,461.9	-	3,461.9	29,123.5	11.89
Fresh Water Pond	193.6	287.8	481.4	52,451.3	0.92
Paddy Field	127.3	776.3	903.6	21,085.1	4.29
Cage	-	-	-	501.6	-
Running Water	-	-	-	5,026.1	-
Open Water	-	-	-	4,479.4	-
Total	11,735.8	20,125.2	31,861.0	338,954.0	9.40
No. of Boats					
Non-Powered Boat	-	-	-	537	-
Small Boat	1,333	29	1,362	2,645	51.49
Medium Boat	89	7	96	3,082	3.11
Large Boat	-	-	-	233	-
Out-Board Motor Boat	1,254	729	1,983	8,695	22.81
In-Board Motor Boat	130	65	195	402	48.51
Total	2,806	830	3,636	15,594	23.32
Area					
Blackish Water Pond (ha)	2,879	-	2,879	34,575	8.33
Fresh Water Pond (ha)	205	142	347	15,209	2.28
Cage (m2)	-	-	-	10,832	-
Paddy Field (ha)	395	1,272	1,667	50,090	3.33
Running Water (m2)	-	5	5	1,202	0.42
Total (ha)	3,479	1,414	4,893	99,875	4.90

Source: Jawa Barat Dalam Angka 1984.

Table I(A)-37 shows the production and value of marine fishery by Kecamatan in Kab. Serang in 1985. Kec. Kasemen, Anyer, Tirtayasa, etc. are the main marine fishery centers in Kab. Serang. Data on production of marine fishery by Kecamatan are not available. But as Fig. I(A)-9 shows, Kec. Labuan with the three marine fishery bases, Labuan, Carita and Sukanegara, is the center of marine fishery in Kab. Pandeglang. According to Dinas Perikanan Pandeglang, the production in Labuan amounted to 2,219 tons in 1985.

The industries and projects on fishery are listed in Table I(A)-38. Most of them are related to shrimps. Shrimps, of which price per kilogram is as expensive as the price of oil per barrel in 1986, are placed as a strategic export commodity in Indonesia. Another shrimp project is being planned around the border area between Kab. Serang and Pandeglang. However, the existing shrimp industry/project do not seem to be successful.

One of the serious problems that the fishery industry in the study region faces is the lack of storage facilities. There is a cold storage at Karangantu in Old Banten in Kec. Kasemen. In the study region, it is the only cold storage, built in 1982, and has a capacity of 150 tons, but it has never been utilized yet. The ice plant attached to it produces 20 tons of ice per day and supplies ice for the local fish dealers. However, most of the fish in sea catch are locally consumed or spoils for lack of storage facilities.

Table I(A)-37 MARINE FISHERY PRODUCTION AND VALUE BY
KECAMATAN IN KABUPATEN SERANG IN 1985

	Production (kg)	Value (Rp. 1,000)
1. Kasemen	572,789	113,194.70
2. Kramatwatu	22,072	5,537.52
3. Pontang	19,216	8,256.50
4. Tirtayasa	53,828	15,906.60
5. Bojonegara	11,524	4,008.00
6. Pulomerak	9,735	2,509.00
7. Anyer	139,269	27,643.68
8. Cinangka	6,670	2,000.53
Total	835,103	179,056.53

Source: Laporan Bulanan Per Kecamatan Tahun 1985,
Dinas Perikanan Kabupaten DT II Serang.

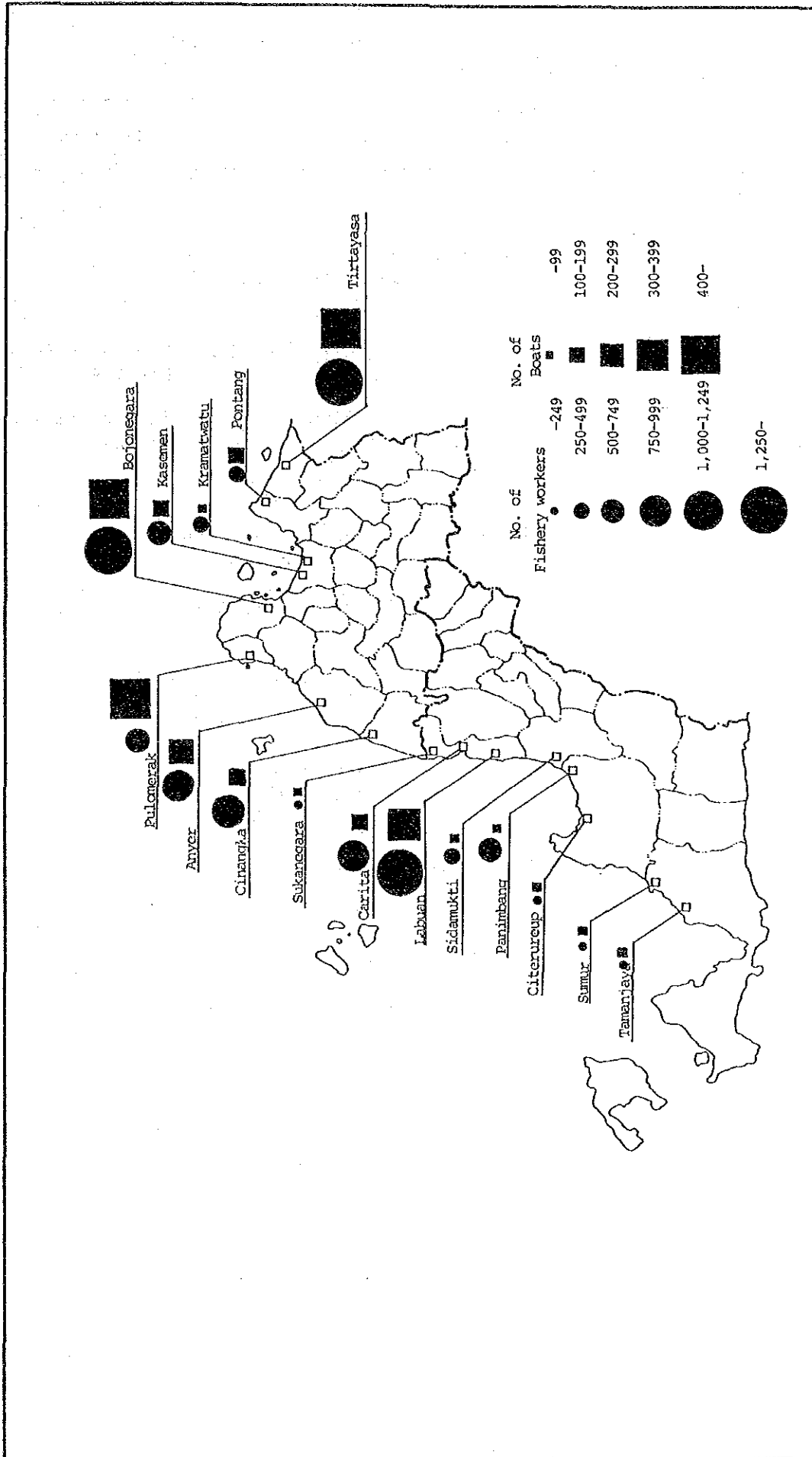


Fig. I (A) -9
MARINE FISHERY BASES IN THE STUDY
REGION, 1985

DEPARTMENT OF TOURISM, POST AND TELECOMMUNICATION
DIRECTORATE GENERAL OF TOURISM
JAPAN INTERNATIONAL COOPERATION AGENCY
THE STUDY ON THE REGIONAL DEVELOPMENT PROJECT
IN THE WESTERN PART OF JAVA

Source: Dinas Perikanan Kabupaten
Serang and Pandeglang

Table I(A)-38 FISHERY INDUSTRIES IN KABUPATEN SERANG
AND PANDEGLANG, 1986

Name of Organization	Location	Activity	Production
Kab. Serang			
1. Research Station for Coastal Aquaculture at Bojonegara	Bojonegara	Research of fish and shellfish culture	
2. PT. Gramida Swadaya (Bankrupt)	Cinangka	Hatchery of shrimps	5 million heads per year
3. PT. DUPER-U (Stopped-machine problem)	Cinangka	Feed production for shrimps	50 ton per year (1985)
(Projects expected to be implemented)			
1. PT. FEGA	Tirtayasa	Fish culture in fish pond (200 ha)	
2. PT. Duta Perkasa Utama		Feed production for shrimps	
3. Dit. Jen. Perikanan	Cinangka	Shrimps (windu) breeding with specified fish pond	
4. PT. INDOKOR	Cinangka	Shrimps (windu) breeding with specified fish pond	
Kab. Pandeglang			
(Projects expected to be implemented)			
1. Tambak Inti Rakyat (TIR)	Labuan	Hatchery of shrimps	
2. PT. Humpas	Labuan	Hatchery of shrimps	
3. PT. Digilog	Labuan	Hatchery of shrimps	
4. No name (National Program aids from ADB)	Labuan	Hatchery of shrimps	

Source: Dinas Perikanan Kabupaten Serang/Pandeglang

2.3.5 Small industry

In the northwestern coastal zone of the study region, there exist modern industries such as Pt. Krakatau Steel Works, Pertamina Petrochemical and Pt. Statomer PVC Resin, and they are also exporting industries. They help the regional economy to grow rapidly, but it is said that they make little contribution to the localities. For example, they can provide little employment opportunities for the people in the region because of the technical gaps and the lack of supporting industries.

Most of existing industries in the study region are classified as small industries. According to the definition of BPS, the enterprises with less than 4 employees are classified as handicrafts and home industries, and those with 5 - 19 employees as small industries.

The total number of small industry units in Kabupaten Serang was 9,841 in 1985/86 as shown in Table I(A)-39. The total number of persons engaged was 31,491 and total production was Rp. 27,426 million in value. Almost 90% of units and persons engaged in small industries belong to food processing industries, especially the production of emping melinjo. The large production centers of emping melinjo in Kab. Serang are the northwestern Kecamatan of Cilegon, Waringinkutung, Mancak, Pulomerak, Bojonegara, Kramatwatu and Taktakan. Especially in the two Kecamatan of Cilegon and Waringinkutung, 4,510 units and 13,830 persons were engaged in the production of emping melinjo in 1985/86. Tempe is produced in Kec. Cilegon, Serang, Walantaka, etc. Processed fish products are made in Kec. Bojonegara and Tirtayasa with marine fishery bases. Salty nuts are processed in Kec. Bojonegara, the largest production center of peanuts in the study region. Bamboo and screw-pine handicrafts are also important industries, which are made in the eastern Kabupatens of Kopo, Pamarayan, Cikande, Walantaka and Ciruas. Relatively high value added industries like cloth and leather are located

Table I (A)-39 SMALL INDUSTRIES IN KABUPATEN SERANG IN 1985/86

Industry/Products	No. of Units	No. of Workers	Total Invest. (Rp. 1,000)	Production		Value Added (Rp. 1,000)
				Volume	Value (Rp. 1,000)	
Food	7,324	22,105	288,980	-	21,867,391	5,214,655
Emping Melinjo	6,522	19,566	192,425	5,277,080 kg	14,502,240	2,498,049
Tempe	370	1,110	27,360	4,348,820 kg	2,891,733	1,253,063
Oncom	19	38	570	114,000 kg	9,120	9,120
Tahu	29	180	16,050	391,500 kg	274,050	154,425
Fish	52	150	3,380	308,880 kg	185,328	39,312
Shrimp	9	81	13,500	392,040 kg	548,856	245,916
Palm-Sugar	176	368	7,200	552,000 kg	941,510	88,590
Salty Egg	15	30	300	54,000	62,100	13,500
Salty Fish	43	174	2,150	569,160 kg	1,422,900	455,400
Bread	24	240	19,200	256,032 kg	307,234	197,510
Acisingkong	26	52	520	169,000 kg	50,700	11,700
Eslilin	5	40	3,000	8,280,000	207,000	26,970
Seasoned Dried Meat	11	22	275	55,000 kg	99,000	33,000
Salty Nuts	14	28	350	30,560 kg	61,120	19,100
Banana Chips	9	26	2,700	145,000 kg	304,500	169,000
Handicraft & General	1,722	4,629	33,115	-	673,015	640,197
Bamboo	954	2,862	14,385	1,586,700	237,505	209,407
Screwpine	82	246	820	16,100	11,970	6,940
Coconut	20	80	1,000	24,000	36,000	32,400
Shell	6	18	150	3,600	9,000	7,650
Horn	23	69	660	55,200	19,000	10,720
Ornament	5	20	225	3,000	45,000	40,000
Birdcage	5	20	75	875	4,200	3,920
Fishnet	10	40	100	600	73,500	58,200
Boat & Cance	5	50	500	28	24,000	15,000
Gerabah	612	1,224	15,200	605,880	212,840	255,960
Cloth & Leather	179	472	225,650	-	551,268	261,240
Bag	12	36	50	21,600	54,000	29,700
Glove	8	24	36,000	96,000 pairs	105,600	19,200
Readymade Clothes	10	100	50,000	60,000	162,000	48,000
Embroidery	40	80	4,000	7,200	14,400	5,760
Sablon	6	18	2,600	18,000	2,160	540
Tailor	65	130	130,000	39,000	136,500	117,000
Bed-Maker	38	84	3,000	4,560	76,608	41,040
Chemistry & Material	433	3,729	571,500	-	3,283,965	2,458,800
Coconut Oil	15	45	2,250	26,250	15,750	2,250
Rubber	5	40	12,000	654,350	20,625	9,375
Tile	139	1,323	268,450	37,377,400	1,174,490	1,095,717
Brick	198	1,605	154,600	55,730,000	849,100	739,418
Furniture	24	240	13,200	12,500	500,000	300,000
Floor Material	6	102	45,000	64,000	16,000	12,040
Sawmill	20	160	45,000	7,000 m3	420,000	180,000
Limekiln	20	160	16,000	12,800 m3	96,000	36,000
Container	6	54	15,000	76,800	192,000	84,000
Metal	183	556	96,995	-	572,315	292,176
Blacksmith	123	360	32,595	161,130	101,786	45,678
Non-Metal Foundry	1	4	600	45,000	3,375	2,700
Metal Foundry	1	8	1,200	4,000	6,000	4,200
Household Tools	41	126	37,400	1,279,499	315,204	168,798
Construction Product	17	58	25,200	5,838	145,950	70,800
Total	9,841	31,491	1,216,240	-	26,947,954	8,867,068

Source: Data Potensi Sentra Industri Kecil Tahun 1985/1986,
Cabang Dinas Perindustrian Kabupaten DT II Serang.

in Kec. Serang and Cilegon. Material industries, including tile, brick, etc. can be seen throughout the Kabupaten.

The total number of small industry units in Kab. Pandeglang was 9,451 in 1985/86 as shown in Table I(A)-40. The total number of persons engaged was 18,109 and total production was Rp. 24,326 million in value. Almost 80% of units and persons engaged in small industries belong to food processing industries, and more than 95% of units and persons in food processing industries are engaged in the production of emping melinjo. The main producers are Kec. Jiput, Pagelaran and Menes, of which units and persons engaged in emping melinjo production occupy about 75% of the total of small industries in Kab. Pandeglang. The second largest small industries in the Kab. is screw-pine handicrafts in Kec. Cimanuk and Banjar.

The average workers per unit of small industries in Kab. Serang and Pandeglang were 3.2 and 1.9 respectively in 1985/86. The productions in value per unit were Rp. 2,787 for Kab. Serang and Rp. 2,574 for Kab. Pandeglang, but those per worker were Rp. 871 for the former and Rp. 1,343 for the latter. This seems to reflect the differences of value added between the two Kabupatens. In this respect, relatively higher value added industries like screw-pine handicrafts in Kab. Pandeglang should be encouraged in Kab. Serang.

Table I(A)-40 SMALL INDUSTRIES IN KABUPATEN PANDEGLANG IN 1985/86

Industry/Products	No. of Units	No. of Workers	Total Invest. (Rp. 1,000)	Production		Value Added (Rp. 1,000)
				Volume	Value (Rp. 1,000)	
Food	7,645	14,320	206,325	-	16,665,000	7,536,000
Emping Melinjo	7,390	13,720	184,950	7,509,950 kg	13,623,000	5,679,000
Tahu	75	205	4,375	399,960 kg	252,000	72,000
Palm-Sugar	100	200	5,000	300,000 kg	90,000	45,000
Salty Fish	80	195	12,000	145,920 kg	2,700,000	1,740,000
Handicraft & General	1,665	3,282	26,335	-	6,409,850	4,403,000
Bamboo	40	80	600	42,000	144,000	84,000
Screwpine	1,609	3,170	24,135	564,446	6,105,850	4,169,400
Gerabah	16	32	1,600	10,996	160,000	149,600
Cloth & Leather	58	194	39,700	-	1,026,000	466,227
Readymade Clothes	55	165	36,500	16,974,000	993,750	397,500
Embroidery	1	23	600	600 set	10,500	9,672
Shoes	2	6	2,600	8,200 pairs	21,750	59,055
Chemistry & Material	48	190	24,000	-	67,800	63,280
Tile	20	62	11,500	940,000	27,600	25,760
Brick	10	48	3,500	469,920	13,800	12,880
Tile & Brick	18	80	9,000	889,920	26,400	24,640
Metal	35	123	57,715	72,520	301,530	283,333
Blacksmith	35	123	57,715	72,520	301,530	283,333
Total	9,451	18,109	354,075	-	24,470,180	12,751,840

Source: Data Potensi Sentra Industri Kecil Tahun 1985/1986,
Cabang Dinas Perindustrian Kabupaten DT II Pandeglang.

ANNEX I (B)

INFRASTRUCTURE

ANNEX I (B)

INFRASTRUCTURE

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CHAPTER 1 TRANSPORTATION

1.1 General

There are currently three types of transportation modes available in principle, namely road transport, rail transport and sea transport, in the study region. There is no facility for air transportation in the region and river transportation is almost inexistent except at a few river mouth due to the lack of navigable river.

Fig. I(B)-1 represents major transportation facilities in West Java and Lampung such as road, port and airport and Fig. I(B)-2 shows the ones in and around the study region.

1.2 Road

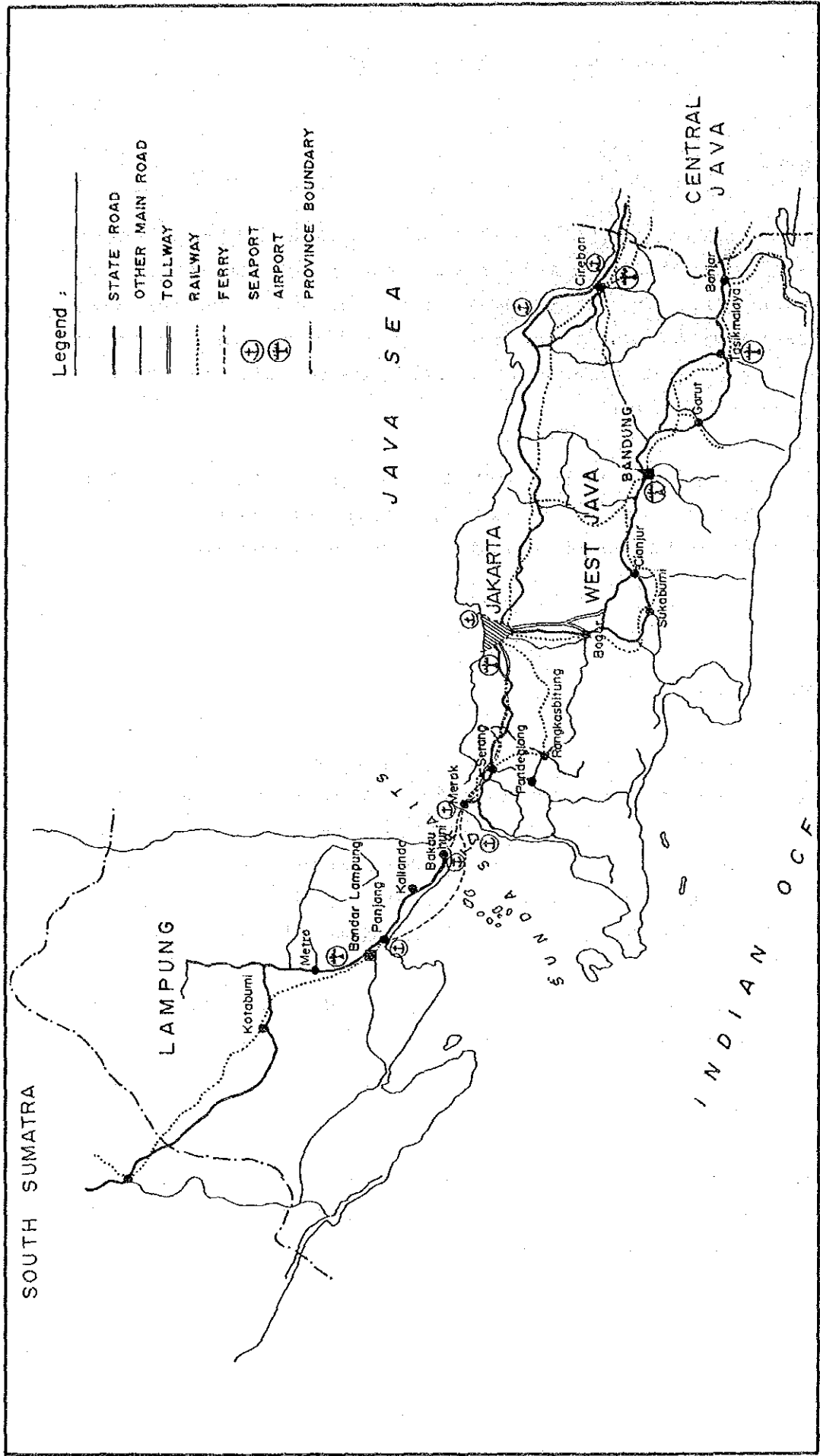
1) General Policy

It is estimated in Indonesia that more than 80% of passenger and 90% of land freight transportation depend on road. This is partly due to the government policy placing emphasis on road development in each Repelita of I to IV. Reflecting this policy, an important amount of investment budget has been allocated to the road development.

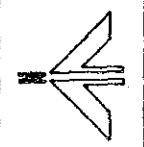
Road development policy of each past Repelita can be summarized roughly as follows:

The Pelita I:

Focus on improvement/rehabilitation of National/ Provincial roads which are vital to the overall development of the nation.



- Legend :
- STATE ROAD
 - OTHER MAIN ROAD
 - TOLLWAY
 - RAILWAY
 - FERRY
 - SEAPORT
 - AIRPORT
 - PROVINCE BOUNDARY



Source: The JICA Study Team
 Non-scale



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Fig. I (B)-1

MAJOR TRANSPORTATION FACILITIES

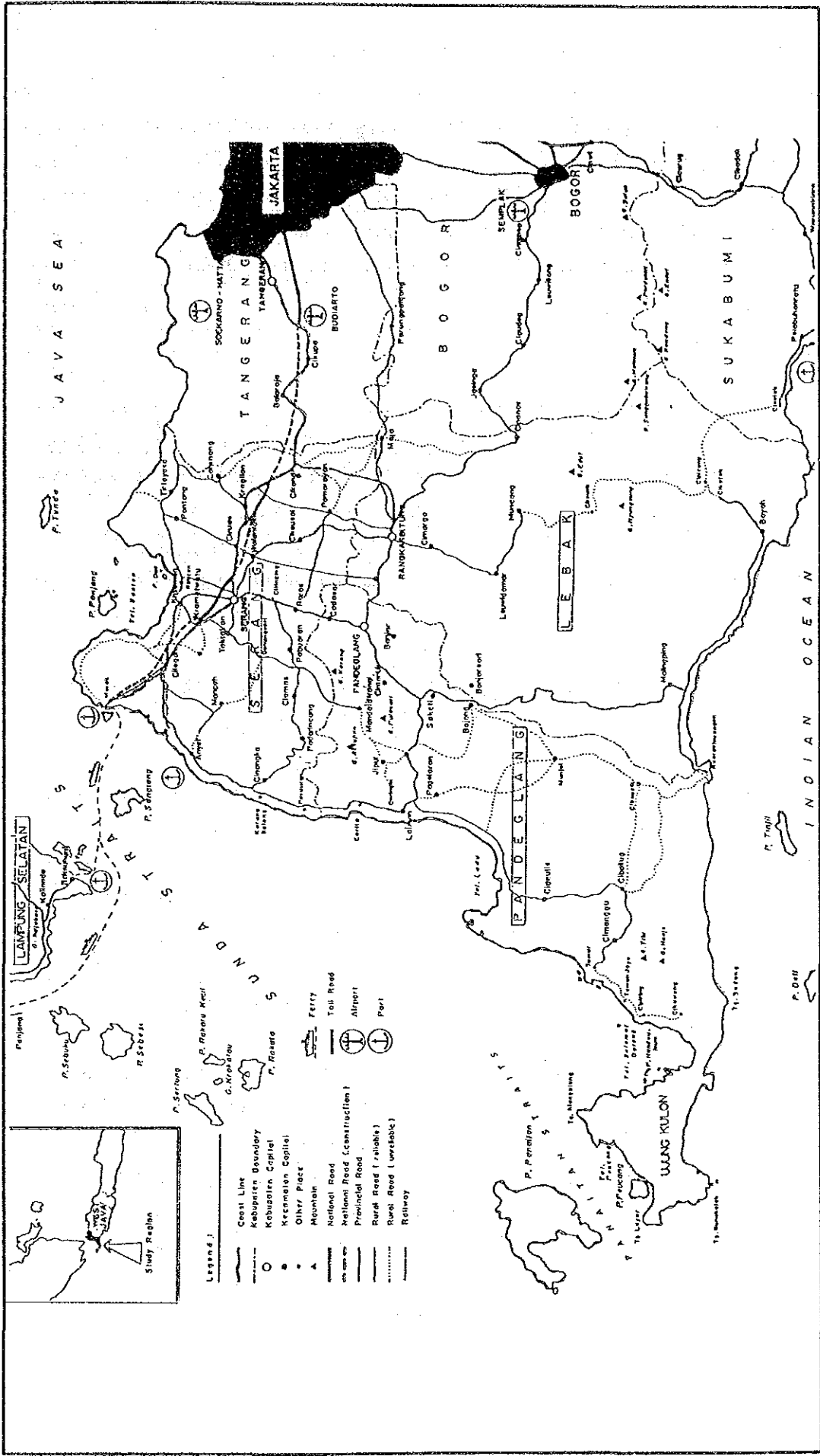


Fig. I (B)-2
TRANSPORTATION IN STUDY REGION

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Source: Prepared by the Study Team
Non-scale

The Pelita II:

Extension of the Pelita I as the principal policy reflecting one of the main themes of the Pelita II which was to correct the regional disparity. Much emphasis was placed on the improvement work of arterial roads based on the long term scheme.

The Pelita III:

To realize the three principles of the Pelita III which are the balanced development, the income increase and the construction of stable and active nation, the following policies were adopted,

- continue improvement and maintenance of existing road;
- improve the access of farm to market from the viewpoint of development;
- harmonized development of other transportation means such as railways;
- development of the roads indispensable to the regional development regardless of the category; and
- construction of toll roads where necessary.

Table I(B)-1 and I(B)-2 show the target and achievement of Repelita I to III. High rate of achievement to target particularly of Repelita III is very significant. During those development periods, the system and organization of works for road are much established. Fig. I(B)-3 represents the level of service ability and road works. Road conditions are classified generally into four categories of good, fair, damaged and very damaged.

Table I(B)-1 TARGET AND ACHIEVEMENT OF FIRST/SECOND PELITA

Works	First Pelita (FY 1969 - 1973)			Second Pelita (FY 1974 - 1978)		
	Target	Achievement	A/T ratio	Target	Achievement	A/T ratio
Road (km)						
Maintenance	-	92,851		50,000	47,978	96%
Rehabilitation	11,255	6,356	56%	14,000	9,114	65%
Improvement		4,075		11,000	4,497	41%
New construction	(6,000)	229	(72%)	1,100	718	65%
Bridge (m)						
Maintenance	-	2,947		-	22,267	
Rehabilitation	64,000	25,357	40%	-	23,789	
Improvement		14,852			19,434	
New construction	(16,000)	904	(98%)	(30,000)	5,184	(82%)

Remark: Figures in parentheses are for both Improvement and New Construction.

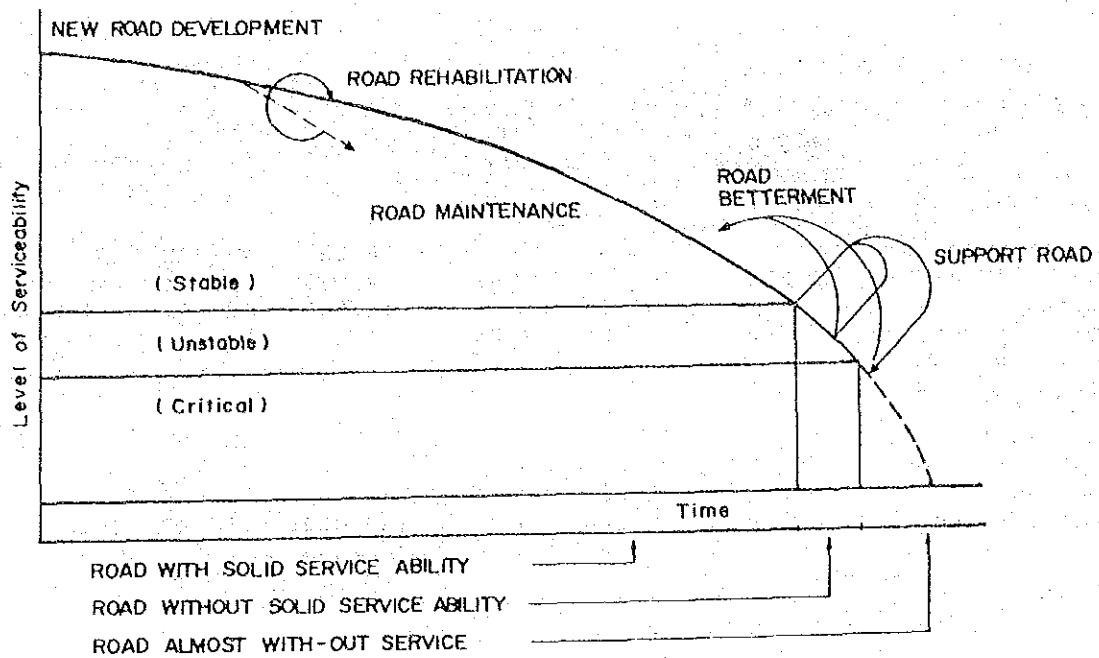
Source: Bina Marga

Table I(B)-2 TARGET AND ACHIEVEMENT OF PELITA III
(FOR BINA MARGA)

	Target	Achievement					Total	A/T Ratio
		1979	1980	1981	1982	1983		
Road (km)								
New Development	975	68	221	521	400	174	1,384	142%
Betterment	11,000	935	1,685	2,367	3,272	2,448	10,708	97%
Support Work	86,200	21,074	18,583	16,566	18,381	15,943	90,547	105%
Rehabilitation	1,600							
Maintenance	29,000	(4,889)	(5,673)	(7,154)	(9,414)	(4,841)	31,971	110%
Bridge (m)	39,800	8,692	11,363	11,611	13,110	9,400	54,176	136%

Remark: Figures in parentheses are for both Rehabilitation and Maintenance.

Source: Bina Marga



Notes: /1 New Road Development

Plan and construct new roads.

/2 Road Betterment

Improve the unstable and critical roads into the stable ones.

/3 Support Work

Recover the better unstable roads from worse unstable and critical ones.

/4 Road Rehabilitation

Special maintenance work on the stable roads when excess damages are found.

/5 Road Maintenance

Daily and small road works which are patching of road surface, clearing of gutter and general maintenances.



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Fig. I(B)-3

LEVEL OF SERVICEABILITY AND ROAD WORKS

Suitable effort is programmed for each category to maintain the condition level to be good. Those programs are categorized as new road development, road betterment, support work, road rehabilitation and road maintenance. Roads are also classified by the management responsibility such as National road, Provincial road, Kabupaten road, Kecamatan road, Desa road, etc. and by type of usage such as arterial road, collector road and local road. Roads other than national and provincial levels are often represented as rural roads.

The Repelita IV was introduced and put into action since the Fiscal Year 1984/85. For the road development, the policies and steps pursued during Repelita III, will be continued and stepped up. Priority will be given to the development of road networks in production centers and those roads connecting centers with markets, including roads in support of transmigration settlements. Construction and upgrading of roads in towns with heavy traffic will be continuously carried out. Table I(B)-3 summarizes the target for road network and Table I(B)-4 shows the target for road transportation facilities of the Repelita IV.

In West Java, the following road links are designated to receive betterment works in Repelita IV:

- Cilegon - Serang - Tangerang
- Serang - Pandeglang - Rangkasbitung - Bogor
- Rangkasbitung - Cikande

TABLE I(B)-3 TARGET OF PELITA IV FOR ROAD NETWORK

	Arterial Road		Collector Road		Local Road
	National	Provincial	National	Provincial	
Maintenance/Rehabilitation	km	8,250	2,750	3,750	11,871
Support Work	km	-	4,300	2,480	34,665
					42,000
	Road	km	370	650	3,380
Betterment/ Replacement	Bridge	m	1,678	12,360	12,662
					21,300
	Boad	km	-	900	-
Intercity	Bridge	m	-	-	-
					-
	Intercity	Road	km	386	844
	Intercity	Road	km	-	150
New Construction	Toll Road	km	198	-	-
	Accss Road	km	-	-	-
					12,000

Source: Repelita IV Chap. 13, Government of Indonesia

TABLE I(B)-4 TARGET OF PELITA IV FOR ROAD
TRANSPORTATION FACILITIES

Facility	Unit	Target
Vehicle testing center	Number	30
Signalization of intersection	Number	213
Road signs	Number	72,000
Road marking	m	1,300,000
Guard fences	m	68,000

Source: Repelita IV Chap. 13, Government of Indonesia

2) Road management and finance

Road development programs are prepared generally by the Directorate General of Road Construction (Bina Marga), the Department of Public Works (PU), keeping a smooth consistency with the programs of the Directorate General of Housing, Building, Planning and urban Development (Cipta Karya). The implementation of road works rests with various organizations within Bina Marga, the Department of Home Affairs, etc. Table I(B)-5 summarizes the responsibility for each category of roads and their works. For national and provincial roads, Bina Marga, RBO, and DPUP jointly take responsibility while the rural roads are left under the control of organizations of the Department of Home Affairs.

There are three major financial sources (APBN, APBD and INPRES) as shown in Table I(B)-6. For arterial roads, only APBN is allocated while the combination of the rest of financial sources is allocated to the collector and local road levels.

Table I (B)-5 ROAD MANAGEMENT RESPONSIBILITY

	New Construction	Betterment	Rehabilitation/Maintenance
National Road	Bina Marga	(Bina Marga, DPUO)	DPUP
Provincial Road	Bina Marga	(DPUP/BINA MARGA)	DPUP
Kabupaten Road	DPUP/DPUK	(DPUP/DPUK)	DPUK
Kotamadya Road	PU Kotamadya	PU Kotamadya	PU Kotamadya

Remarks: Bina Marga .. Dit. Gen. Bina Marga
 RBO Regional Betterment Office,
 Bina Marga
 DPUP Provincial Division of Public Works,
 PU
 DPUK Kabupaten Division of Public Works,
 Department of Home Affairs
 PU Kotamadya . Kotamadya Division of Public Works,
 Department of Home Affairs

PBO is an agent of Bina Marga (Central) and participates in the planning, programming, design and supervision but is not an executing agency.

For the time being, the betterment work of national/provincial roads is handled by Bina Marga since the local budget is very small.

Source: Dit. Gen. Bina Marga

Table I(B)-6 ROAD MANAGEMENT AND FINANCIAL RESOURCES

Work	Arterial Road	Collector Road	Local Road	Toll Road
New Construction	APBN	APBN	APBD TK I APBD TK II	APBD Private Fund Fare Collection
Betterment	APBN	APBN + APBD TK I	APBD TK II	---
Support Work	APBN	APBN + APBC TK I	INPRES Jalan Kabupaten	---
Rehabilitation/ Maintenance	APBN	APBD TK I	APBD TK II	Fare Collection
Bridge Replacement	APBN	APBN + APBD TK I	APBD TK II	---

Remarks: INPRES Jalan Kabupaten National Budget
 APBD TK I Provincial Budget
 APBD TK II Kabupaten Budget
 INPRES Jalan Kabupaten Special Budget

Source: Dit. Gen. Bina Marga

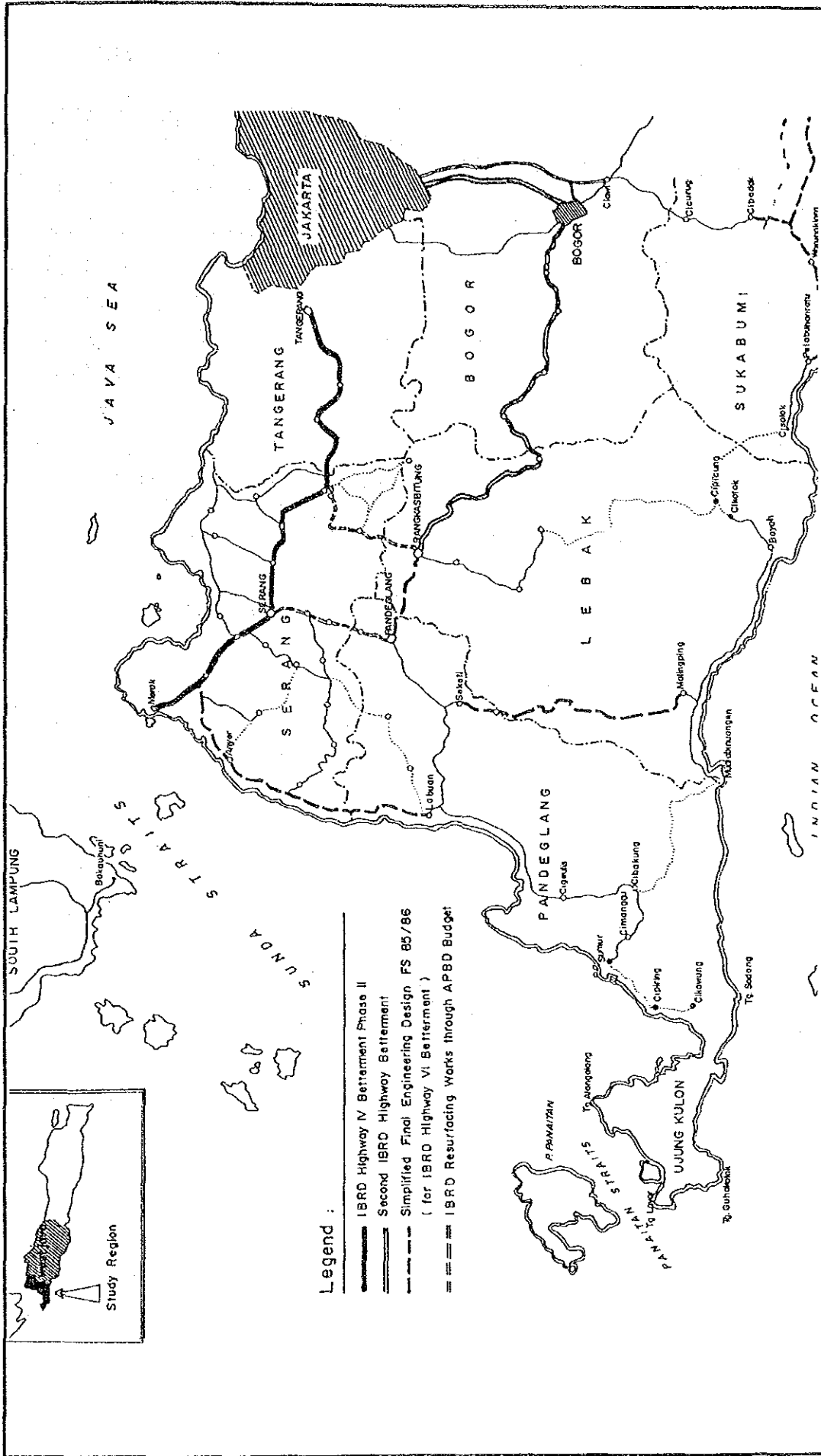
(1) Road management for national and provincial roads

National and provincial roads are managed by the Directorate General of Bina Marga, the Department of Public Works, and its organizations of the Regional Betterment Offices and the Provincial Division of Public Works. Financial resources for road management works are mostly from the national budget (APBN), and added partly from the provincial budget (APBD), as well.

A good number of projects are assisted by the International Bank of Reconstruction and Development (IBRD) - World Bank, the Asian Development Bank (ADB) and other loan agencies receiving loans accounting roughly about 60% of each project cost. The Government of Indonesia provides the rest of project cost. Fig. I(B)-4 represents the locations of IBRD programs betterment works. Almost all of national and provincial roads in the study region is scheduled to be taken care of in near future.

(2) Rural roads such as the Kabupaten roads and Kecamatan roads are managed by the Kabupaten Division of Public Works, DPUK, of the Department of Home Affairs and by the Bina Marga (central). The fund for management comes from the national budget, APBN; provincial and Kabupaten budget, APBD; and special budget such as INPRES.

Table I(B)-7 summarizes a five year road program for Fiscal Year of 1984/89 prepared by Bina Marga, receiving assistance from the IBRD supported Rural Road Study Project. Under the scheme, the almost all the rural roads are taken care of in turn. Fig. I(B)-5 shows the programs for FY 1987/89 as an example.



Source: Dit. Gen. Bina Marga

Non-scale

Legend :

- IBRD Highway IV Betterment Phase II
- Second IBRD Highway Betterment
- Simplified Final Engineering Design FS 85/86 (for IBRD Highway VI Betterment)
- IBRD Resurfacing Works through APBD Budget

Fig. I (B)-4

ROAD WORKS PROGRAM BY BINA MARGA

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JAPAN INTERNATIONAL COOPERATION AGENCY

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Table I(B)-7 FIVE YEAR ROAD PROGRAM IN KAB. SERANG
FOR FY 1984 - 89

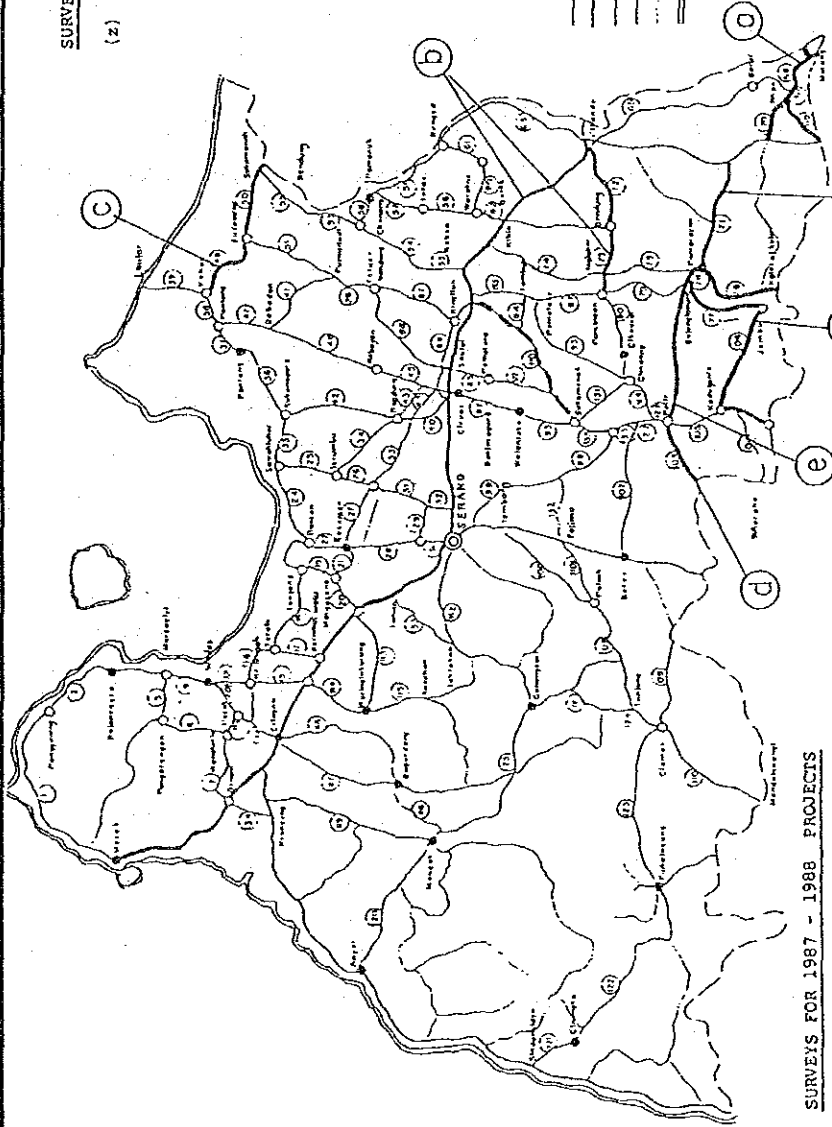
(Rp. x 10⁶)

Fiscal Year	New Construction		Betterment		Support Work	Total
	Road	Bridge	Road	Bridge		
1984/85	186.2	98.0	421.8	-	199.1	905.1
1985/86	42.6	248.6	691.5	-	107.0	1,089.7
1986/87	-	913.5	254.4	-	128.5	1,296.4
1987/88	1,016.0	21.0	37.5	-	485.0	1,559.5
1988/89	478.7	371.0	340.4	-	674.6	1,864.7

Source: Rural Road Study Project Report (January 1984)
Dit. Gen. Bina Marga

SURVEYS FOR 1988 - 1989 PROJECTS

(z) SENTUL - NYAPAH 12 Km

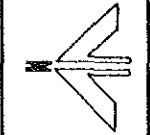
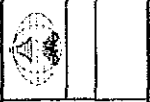


KEJERANGAN
 (●) IBUKOTA KABUPATEN
 (○) KOTA MEGAHATAN
 (○) DESA KOTA LAHNYA
 (---) BATAS KABUPATEN
 (---) JALAN MEGARA
 (---) JALAN PROPINSI
 (---) JALAN KABUPATEN yg DISURVEY
 (---) JALAN DESA
 (---) GARIS PANTAI

SURVEYS FOR 1987 - 1988 PROJECTS

(a) JEMBATAN CIDURIAN - KOFO - CEMPLANG	10,4 Km
(b) CIKANDE - JEMBATAN CIKEUSAL	9,0 Km
(c) PONTANG - SUKAMANNI	10,4 Km
(d) SUKAJAYA - PETIR	3,8 Km
(e) CICODEG - KOLELET KULON	17,0 Km
(f) PANYABRANGAN - JAMBU - SOROK	15,0 Km
(g) BURENDONG - PAMADAYAN	7,3 Km
TOTAL	72,9 Km

DIREKTORAT BINA PROGRAM JALAN
 SUB DIT PROGRAM JALAN LOKAL & KABUPATEN
PETA JARINGAN JALAN
 KABUPATEN : SERANG (20)
 PROPINSI : JAWA BARAT (22)
 SUMBER DATA : GAMBAR
 TAMBAH NOPEMER 1984
 STUDIO KABUPATEN JKT
 NO. LBR
 INT



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Fig. I (B) - 5
MAINTENANCE SCHEDULE FOR
FY 1987/88 AND 1988/89

Non-scale

(3) Road management in Kab. Pandeglang

Management organization and budgetary system are much the same as those of Kab. Serang. Table I(B)-8 summarizes the three year road programs for Fiscal Year 1982/85. Implementation outcome is not yet sorted. Table I(B)-9 shows the next five year road program for FS 1986/91 prepared by Bina Marga. Well over one billion Rupiah is necessary each year to implement those programs. Fig. I(B)-6 shows the location of programs for FY 1987/88.

(4) Road maintenance cost

Contents and progress of road works are quite standardized so as to determine the unit cost for each type of works to be used for planning of road work programs. Table I(B)-10 summarizes the cost of maintenance depending on existing type, condition and width of surfacing. Tables I(B)-11 and I(B)-12 summarize the cost for rehabilitation of rural road for Kab. Serang and Kab. Pandeglang respectively.

3) Road network in the study region

Major road networks in the study region are shown in Fig. I(B)-2.

There are about 14,300 km of road in West Java Province in 1984 as shown in Table I(B)-13. This figure represents 0.31 km of road per 1 km² of area which is slightly higher than the national average of 0.21 km per km². It can also be valued as 0.51 km of road per 1,000 population which is much smaller than the national average of 1.21 km per 1,000 population.

Table I(B)-8 THREE YEAR ROAD PROGRAM IN KAB. PANDEGLANG
FOR FY 1982/1985

(Rp. x 10⁶)

Fiscal Year	New Construction		Betterment		Support Work	Total
	Road	Bridge	Road	Bridge		
1982/83	-	19.15	1,179.61	-	-	1,270.76
1983/84	-	157.41	666.54	-	978.46	1,802.41
1984/85	-	526.23	391.84	-	1,002.80	1,920.87

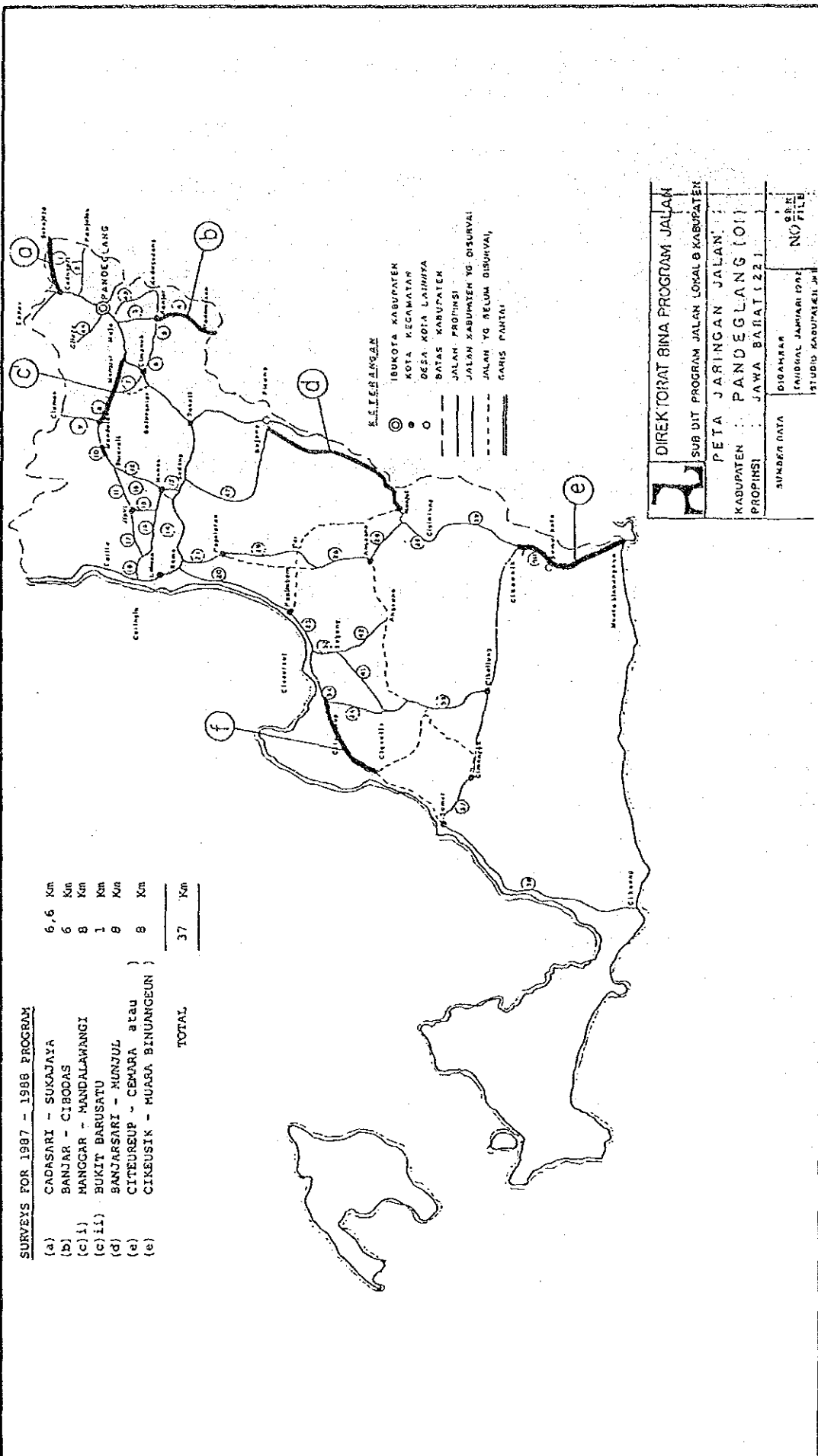
Remark: Rates as at 1st April 1981

Source: Rural Road Study Project Report (January 1982)
Dit. Gen. Cipta Karya


Table I(B)-9 FIVE YEAR ROAD PROGRAM IN KAB. PANDEGLANG
FOR FY 1986/1991

Fiscal Year	Road (km)	Bridge		Total (Rp. x 10 ⁶)
		(No.)	(m)	
1986/87	36.7	17	115	1,376
1987/88	47.0	10	120	1,052
1988/89	54.1	7	54	1,105
1989/90	63.3			1,128
1990/91	32.3	3	35	852

Source: Five Year Program, Dit. Gen. Bina Marga



DIREKTORAT BINA PROGRAM JALAN	
SUB DIT PROGRAM JALAN LOKAL & KABUPATEN	
PETA JARINGAN JALAN	
KABUPATEN : PANDEGLANG (01)	
PROVINSI : JAWA BARAT (22)	
SUNDER DATA	DIGAMBAR FAKDOOL JAMHARI 1982 STUDIUM KAPUTASIAI 3/81
	NO FILE



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Fig. I (B) - 6

MAINTENANCE SCHEDULE FOR FY 1987/88

Non-scale

Table I(B)-10 STANDARD UNIT COST OF ROAD MAINTENANCE (APBD)

West Java Province

(Rp. 10³ per km as of April 1986)

	Good		Fair		Damaged		Very Damaged	
	Width (m)		Width (m)		Width (m)		Width (m)	
	<4.5	≥4.5	<4.5	≥4.5	<4.5	≥4.5	<4.5	≥4.5
1. All Weather Solid Gravel Road (JAPAT or AGKAS)	600	600	3,600	5,400	5,400	7,200	5,400	7,200
2. Asphalt - Concrete (LASTON) (LASTN)	2,000	3,000	13,860	20,700	18,400	34,500	41,400	70,200
3. Thin Asphalt - Concrete (HRS)	2,000	3,000	6,176	9,264	9,264	13,896	13,860	20,790
4. Asbuton/Aggregate Mixture (LASBUTAG)	2,000	3,000	2,000	3,000	8,000	12,000	18,000	27,000
5. Thin Pure - Asbuton (LATASBUM) (NACAS)	600	600	2,000	3,000	2,000	3,000	8,000	12,000
6. Thin Asphalt/Sand Mixture (LATASIR)	600	600	2,000	3,000	7,200	10,800	7,200	10,800
7. Penetration Macadam (LAPEN) PM-1, PM-2	600	600	2,000	3,000	15,440	23,160	15,440	23,160
8. Very Thin Layer of Asphalt (BURTU)	600	600	2,000	2,000	6,176	9,264	6,176	9,214
9. Very Thin Two Layer of Asphalt (BURDA)	600	600	2,000	3,000	6,176	9,264	9,264	13,896
10. Very Thin Asphalt (BURAS)	600	600	2,000	3,000	2,000	3,000	2,000	3,000
11. Tuck Coat A (GOA)	600	600	600	600	3,600	5,400	3,600	5,400
12. Tuck Coat B (GOB)	600	600	600	600	3,600	5,400	3,600	7,200

Sources: Dit. Gen Bina Marga

Table I(B)-11 STANDARD CONSTRUCTION COSTS OF ROADS PER KILOMETER IN KAB. SERANG

Province: Jawa Barat (20)
Kabupaten: Serang (20)

(Unit: Rp. in 1986)

Present	Rehabilitation Level	Good AWCAS	Good Gravel	Good Asphalt			Routine Allowance
				Penetration	Asbuton	Concrete Asphalt	
Asphalt	Good	0	0	0	0	0	978,594
	Sufficient	0	0	6,456,780	18,744,000	14,824,800	1,204,810
	Damaged	0	0	10,949,800	23,004,900	19,085,700	0
	Heavily damaged	0	0	14,928,400	26,113,500	22,194,300	0
Gravel	Good	0	0	14,882,400	21,427,200	17,508,000	995,401
	Sufficient	0	4,313,270	15,923,000	22,467,800	18,548,700	1,214,220
	Damaged	0	6,321,970	17,875,100	24,419,900	20,500,700	0
	Heavily damaged	4,915,570	8,962,990	20,315,500	26,860,400	22,941,200	0
Earth	Good	4,853,280	11,747,000	21,727,800	28,272,600	24,353,400	693,014
	Sufficient	4,911,500	11,834,300	21,815,100	28,360,000	24,440,900	1,138,830
	Damaged	5,156,500	12,079,300	22,060,100	28,605,000	24,685,800	0
	Heavily damaged	5,360,280	12,312,200	22,293,000	28,837,900	24,918,700	0
		9,050,250	16,228,200	8,700,510	15,245,400	11,326,200	0

Sources: Dit. Gen. Bina Marga

Table I(B)-12 STANDARD CONSTRUCTION COSTS OF ROADS PER KILOMETER IN KAB. PANDEGLANG

Province: Jawa Barat (20)
Kabupaten: Pandeglang (01)

(Unit: Rp. in 1986)

Present	Rehabilitation Level	Good		Good Asphalt			Routine Allowance
		AWCAS	Gravel	Penetration	Asbuton	Concrete Asphalt	
Asphalt	Good	0	0	0	0	0	970,494
	Sedang	0	0	5,658,890	18,154,400	11,254,900	1,188,610
	Damaged	0	0	9,958,680	22,293,900	15,394,400	0
	Heavily damaged	0	0	13,670,900	25,357,400	18,458,000	0
Gravel	Good	0	0	12,388,100	20,668,700	13,769,200	996,401
	Sufficient	0	4,314,520	13,430,000	21,710,500	14,811,000	1,214,220
	Damaged	0	6,324,470	15,383,300	23,663,800	16,764,400	0
	Heavily damaged	4,918,070	8,965,490	17,823,700	26,104,300	19,204,800	0
Earth	Good	4,854,530	11,748,300	19,234,700	27,515,300	20,615,800	693,014
	Sufficient	4,912,750	11,835,600	19,322,100	27,602,600	20,703,200	1,138,830
	Damaged	5,159,000	12,081,800	19,568,300	27,848,900	20,949,400	0
	Heavily damaged	5,362,780	12,314,700	19,801,200	28,081,800	21,182,300	0
		9,052,750	16,230,700	6,386,230	14,666,800	7,767,300	0

Table I(B)-13 LENGTH OF ROADS IN WEST JAVA AND INDONESIA

	1980	1981	1982	1983	1984
Area (km ²)					46,300
Population (x 1,000)	27,104	27,506	27,698	27,918	28,230
National Road	664	664	664	654	654
Provincial Road	1,881	1,881	1,881	1,987	1,987
Rural Road	8,897	9,007	9,865	11,388	11,703
Total Road Length	11,442	11,552	12,410	14,029	14,344
Area (km ²)					919,443
Population (x 1,000)	147,490	151,000	154,600	158,083	161,580
National Road (km)	12,152	11,857	11,935	11,988	11,938
Provincial Road (km)	33,164	33,182	33,973	35,983	36,310
Rural Road (km)	96,998	109,142	119,230	136,768	146,696
Total Road Length	142,314	154,181	165,138	184,739	194,944

Sources: Directorate General of Road Construction;
 Statistics Indonesia 1985;
 Jawa Barat Dalam Angka 1980 - 1984.

The total length of road increased by 25% during a four year period from 1980 to 1984 while the figure for the whole nation accounted for 37% for the same period. The most increase was registered for the rural road level followed by a slight increase of the provincial road level. The length of national road, meanwhile stayed almost constant during this period, even showing a slight decrease as a result of an adjustment of road classification.

Table I(B)-14 summarizes the length of roads by surface type. The figures for Kab. Serang, Kab. Pandeglang and West Java represent the rural roads, which are Kotamadya and Kabupaten roads, while those for the whole Indonesia further include national and provincial roads. The national and provincial roads, in those two Kabupatens apparently are all asphalt surfaced. The inventory of those major roads in and around the study region is shown in Fig. I(B)-7. The Cilegon - Labuan section is classified under fair to good condition but has several parts with very narrow road width.

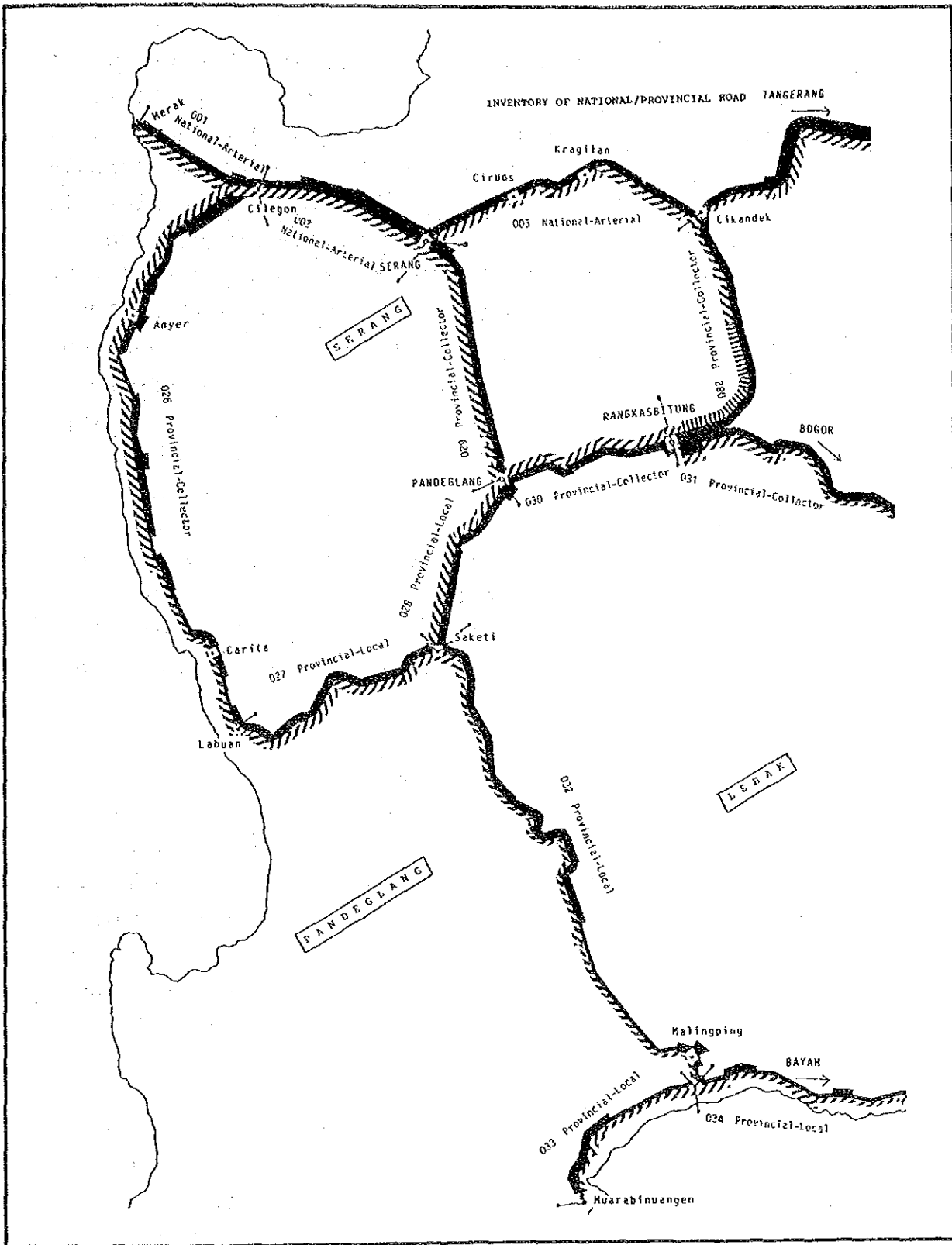
There are approximately 60 km of national roads in Kab. Serang and approximately 80 km of provincial roads in each Kabupaten, roughly measured by the Study Team. Adding these mileage to the figures in the pre-mentioned table, the road length per 1 km² and per 1,000 population are 0.46 km and 0.75 km for Kab. Serang and 0.23 km and 0.83 km for Kab. Pandeglang respectively. In respect of area, Kab. Serang is quite favorably developed in road while Kab. Pandeglang is very near to the low rate of national level. In respect of population, however, both Kabupatens have higher rate than that of West Java, indicating low population density of those two Kabupatens, particularly Kab. Pandeglang.

Table I(B)-14 LENGTH OF ROADS BY SURFACE TYPE

		1980	1981	1982	1983	1984
Kabupaten	Area (km ²)					1,876
Serang	Population	1,109	1,120	1,127	1,141	1,156
(Rural Road only)	(x 1,000)					
	Asphalt (km)	360	369	370	377	364
	Gravel (km)	80	75	98	208	202
	Earth (km)	162	158	171	171	165
	Others (km)	-	-	-	-	-
	Total (km)	602	602	639	756	731
Kab.	Area					2,609
Pandeglang	Population	695	701	705	717	719
(Rural Road only)	Asphalt	175	208	225	131	261
	Gravel	137	50	45	209	121
	Earth	101	163	151	125	127
	Others	NA	68	68	54	10
	Total	NA	489	489	519	519
West Java	Area					46,300
(Rural Road only)	Population	27,104	27,506	27,698	27,918	28,230
	Asphalt	5,692	6,035	6,160	6,575	7,030
	Gravel	1,534	1,529	1,685	2,799	2,629
	Earth	764	808	1,364	1,792	1,931
	Others	907	634	656	222	113
	Total	8,897	9,006	9,865	11,388	11,703
Indonesia	Area					919,443
(Whole Road)	Population	147,490	151,000	154,600	158,083	161,580
	Asphalt	56,169	62,741	66,319	72,646	77,825
	Gravel					
	Earth	74,153	79,860	88,272	98,279	103,062
	Others	11,642	11,580	10,547	13,814	14,057
	Total	142,314	154,181	165,138	184,739	194,944

Remark: Figures for Indonesia include whole road while those for others do only rural roads.

Sources: Directorate General of Road Construction;
 Statistics Indonesia 1985;
 Jawa Barat Dalam Angka 1980 - 1984.



Legend

- Width of Pavement
 - 4.0m and under
 - 4.0m - 7.0m
 - 7.0m and over
- Condition of Pavement
 - Good
 - Fair
 - Damaged
- Route No. Status - Function

Non-scale



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Fig. I(B)-7

INVENTORY OF NATIONAL/ PROVINCIAL ROADS

In 1984, a half of the rural roads in both Kabupatens of Serang and Pandeglang are asphalt surfaced while the rests are almost equally divided into between gravel and earth. At the provincial level of West Java, the rate of asphalt surfacing in 1984 is 60% and at the national level it is 40%. The figures for the two Kabupatens can be assessed as less developed by West Java level but well cared-for by the national level. During a period from 1980 to 1984, the length of asphalt surfaced roads at national and provincial level has increased almost steadily despite of lagged progress in Kab. Serang and Pandeglang. This indicates more attention required to those Kabupatens.

Table I(B)-15 shows the condition of roads. Improvement progress at both Kabupaten and provincial level is not clearly indicated, probably meaning the speed of maintenance and damage by increased traffic fell into vicious circle. It will require a substantial investment to get out of this situation.

(1) Vehicle registration

Table I(B)-16 represents the number of vehicles registered at each year from 1980 to 1984. In West Java, there are more than 800,000 vehicles registration in Indonesia while DKI Jakarta occupies alone a fifth of the total. Those figures indicates per 1,000 population registration of 28 for West Java, about 170 for Jakarta and 40 for Indonesia.

In 1984, the composite percent ratios of passenger car, bus, truck and motor cycle for West Java, Jakarta and Indonesia are respectively 19, 3, 16, 62; 26, 7, 12, 55; and 14, 3, 12, 71 in the same order. In respect of area, the statistics indicate more of passenger car to densely populated district or more of motor cycle otherwise.

Table I(B)-15 LENGTH OF RURAL ROADS BY CONDITION

		(km)				
		1980	1981	1982	1983	1984
Kab. Serang	Area (km ²)					1,876
	Population (x 1,000)	1,109	1,120	1,127	1,141	1,156
	Good	148	168	200	185	151
	Fair	147	125	146	129	193
	Damaged	190	128	125	398	344
	Very Damaged	116	181	168	44	43
	Total	601	602	639	756	731
Kab. Pandeglang	Area					2,609
	Population (x 1,000)	695	701	705	717	719
	Good	175	154	166	131	161
	Fair	34	105	59	209	184
	Damaged	76	125	149	125	120
	Very Damaged	NA	105	115	54	54
	Total	NA	489	489	519	519
West Java	Area					46,300
	Population (x 1,000)	27,104	27,506	27,698	27,918	28,230
	Good	2,513	2,581	3,067	3,476	3,489
	Fair	2,293	2,555	2,776	3,641	3,453
	Damaged	2,089	2,071	2,368	3,132	3,256
	Very Damaged	1,990	1,789	1,654	1,139	1,505
	Total	8,885	9,006	9,865	11,386	11,703

Source: Directorate General of Road Construction;
 Statistics Indonesia 1985;
 Jawa Barat Dalam Angka 1980-1984.

Table I (B)-16 NUMBER OF MOTOR VEHICLES REGISTERED IN WEST JAVA, DKI JAKARTA AND INDONESIA

	1980	1981	1982	1983	1984
West Java					
Passenger Car	122,910	133,408	142,497	152,496	152,443
Buses	10,997	15,339	16,983	19,775	22,904
Truck	91,864	110,426	116,113	117,087	128,703
Motor Cycle	329,254	392,062	420,498	462,380	501,756
Total	555,125	651,235	696,091	751,738	805,806
DKI Jakarta					
Passenger Car	220,872	247,066	275,139	299,164	321,837
Buses	29,546	38,478	49,827	62,515	81,047
Truck	75,219	95,858	112,494	126,859	140,562
Motor Cycle	428,909	495,312	570,972	628,414	669,906
Total	745,546	876,714	1,008,432	1,116,952	1,213,352
Indonesia					
Passenger Car	639,464	719,336	791,019	865,940	925,335
Buses	86,284	113,509	134,430	160,260	190,808
Truck	473,831	589,439	657,104	713,873	787,677
Motor Cycle	2,671,978	3,207,499	3,764,442	4,135,677	4,550,742
Total	3,71,557	4,629,783	5,346,995	5,875,750	6,454,562

Source: Biro Pusat Statistik

During a period from 1980 to 1984, the total vehicle registration in Indonesia increased by approximately 70% while that of West Java was about 45% and Jakarta was 60%.

Table I(B)-17 shows that data available of the study area which is represented as a registration zoning of Banten. In 1983 the number of vehicles registered in Banten was about 33,000 or 12 per 1,000 population. This ratio is less than a half of that for West Java. The composite percent ratio of 9:3:15:73 for passenger car, bus, truck and motor cycle, respectively, further indicates much smaller ratio of passenger car than that of the whole Indonesia.

(2) Traffic volume

Fig. I(B)-8 represents the traffic counts results of 1974, 1979 and 1984 at major counting points in and around the study region.

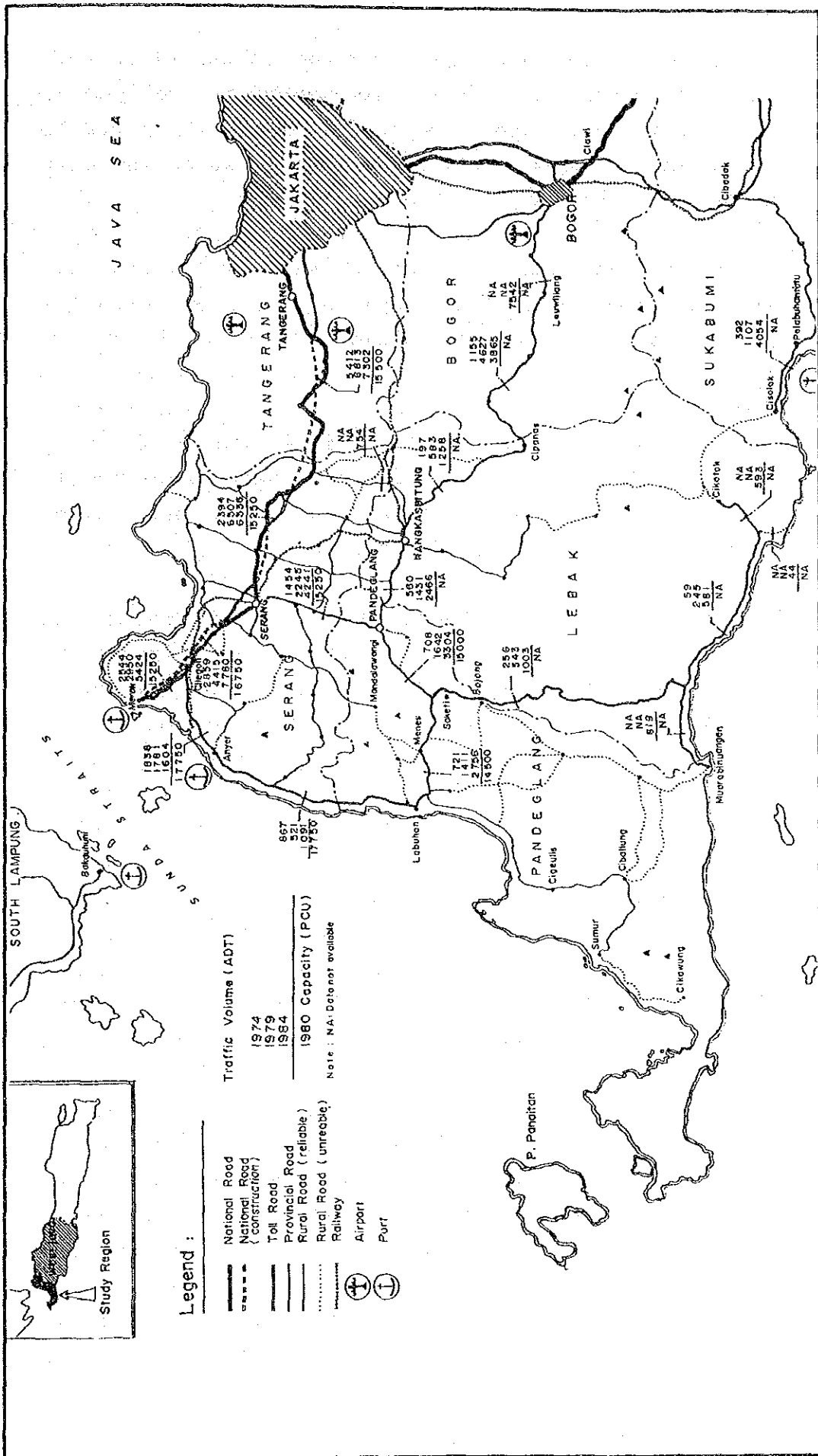
Traffic volume is substantially high along the east-west corridor between Jakarta and Merak with the higher volume registered nearer toward Jakarta. The volume level stays almost the same along this corridor within the study region until Cilegon where the flow splits into two, the thicker one to Merak and the other thin one toward the west coast.

There is another big branch-off at Serang from this major flow toward Pandeglang and which again splits off toward Rangkasbitung and Saketi. The flow from Bogor toward the region is about a half of that from Jakarta but becomes very small just before Rangkasbitung indicating the preference of commodity transportation to be from Jakarta - Tangerang toward the southern part of the region.

Table I(B)-17 MOTOR VEHICLE REGISTRATION

		1980	1983
Banten zoning	Passenger Car	2,594	2,999
	Bus	389	1,024
	Truck	4,297	4,811
	Motor Cycle	10,873	23,752
	Total	18,153	32,586
West Java	Passenger Car	122,910	152,496
	Bus	10,997	19,775
	Truck	91,664	117,087
	Motor Cycle	329,354	462,380
	Total	555,125	751,738
Indonesia	Passenger Car	639,464	865,940
	Bus	86,284	160,260
	Truck	473,831	718,873
	Motor Cycle	2,671,978	4,135,677
	Total	3,871,557	5,875,750

Source: Biro Pusat Statistik
Jawa Barat Dalam Angka 1984



Source: Dit. Gen. Bina Marga

Non-scale

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Fig. I(B)-8 TRAFFIC VOLUME

The flow from Malingping/Simpang toward Saketi is very small indicating that this area is less developed in the region, although this flow is the only reliable route for the area from Muarabinuangen to as far east as Bayah and Cikotok.

The flow from Labuan to Saketi is twice larger than that from Carita/Cinangka, probably due to a big flow joining from south toward Labuan.

The overall level of traffic volume doubled within ten years from 1974 to 1984. The middle link along Saketi - Pandeglang - Rangkasbitung recorded a triple increase during the same period indicating a high speed development of this area.

Although the traffic capacity as of 1980 still has enough traffic flow, it should be noted that the figures are only representing an average of daily traffic. It is very easy to suggest congestion during the holiday period.

(3) Public transportation

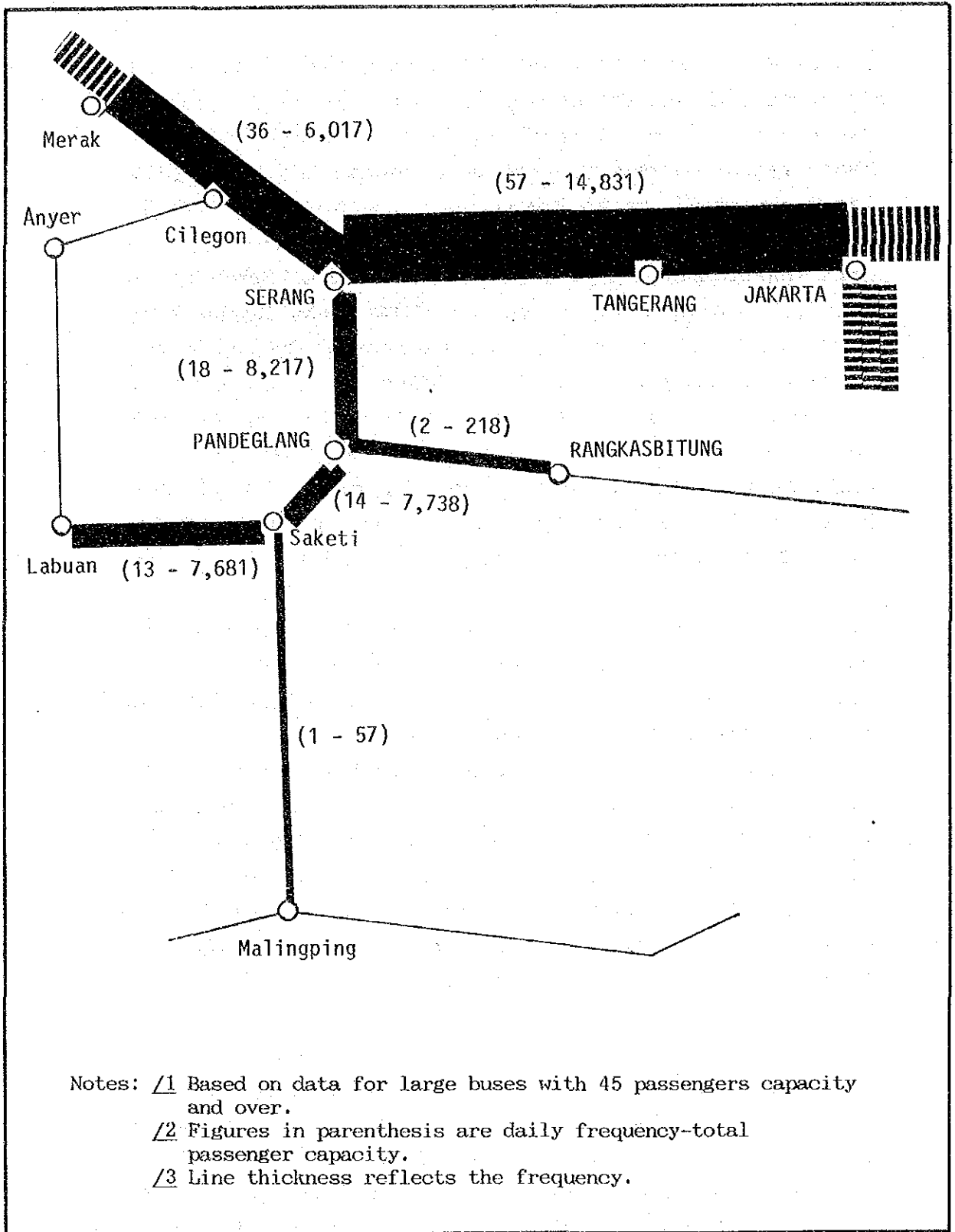
For passenger movement on road, buses of medium to large size are used for inter-provincial movement, buses, micro-buses and bemos are used for inter-towns/city movement and micro-buses, bemos, motor-cycles and becaks are used for movement in towns and villages.


There are about 6,000 large buses and 8,000 small buses for public transportation uses registered in West Java in 1984 according to the Jawa Barat Dalam Angka. Almost all of them are owned by private operators. Of them all, only 225 of large and 609 of small buses are registered in Banten area. Operation of them, route and fare are controlled by the

Directorate General of Land Transportation. There are bus terminals at Kabupaten centers such as Serang and Pandeglang. Some of long distance buses make stops at those terminals where passengers change the buses from large to small or to becak and vice-versa. Fare is set at comparatively reasonable level. For example from Pandeglang, Jakarta is Rp. 1,025, Bandung is Rp. 2,625, Banjar is Rp. 3,800, Malingping is Rp. 625, etc. Fig. I(B)-9 represents the route, frequency and passenger capacity of large buses. The Serang - Jakarta section receives the most frequent bus services with 15 to 20 minutes headways followed by the Serang - Merak section with approx. 30 minutes headways. Many more small buses are operating along side of those as well as along other routes.

The number, route and fare of micro-buses are controlled also. There are over 35,000, or 1.2 per 1,000 population, of those registered in West Java in 1984 according to the Jawa Barat Dalam Angka. Of those, about 1,300 are registered in Banten area. The size of them are mostly around 10 passengers capacity. It is observed however, they are frequently running over-crowded by both passengers and commodities. They make stops at anywhere by the request of users for both getting on and off as long as they go along the fixed route.

There are over 65,000 becaks, or 2.3 of them per 1,000 population, in West Java in 1984 according to the Jawa Barat Dalam Angka. About 10% of them are counted in Banten area. The ride on them is limited to a short distance but their use is not only for the passengers movement but also for carrying commodities.



Source: Direktorat Jenderal Perhubungan Darat	 DEPARTMENT OF TOURISM, POST AND TELECOMMUNICATION DIRECTORATE GENERAL OF TOURISM
	JAPAN INTERNATIONAL COOPERATION AGENCY
	THE STUDY ON THE REGIONAL DEVELOPMENT PROJECT IN THE WESTERN PART OF JAVA
	Fig. I(B)-9 MAJOR BUS ROUTE, FREQUENCY AND CAPACITY

Over 30,000 trucks and about 23,000 pick-ups for public uses are registered in West Java in 1984 according to the Jawa Barat Dalam Angka. Out of those, only about 1,500 trucks and 2,300 pick-ups are registered in Banten area.

Apart from these vehicles for public transportation uses, there are quite a large number of fleet owned and operated by private and national organizations for their own limited uses. Their number in overall rough estimate, could be very comparable to the one for public uses.

1.3 Rail Transportation

1) General development

The railway networks in Indonesia are constructed only in Sumatra, Java and Madura islands and operated and managed by the Indonesian National Railway (PJKA). The total length of railways has not changed from about 6,700 km for some years, consisting of approximately 1,400 km in West Java, 1,700 km in Central Java, 1,600 km in East Java and the rest, 2,000 km, in Sumatra, according to the Railway Statistics in 1983 of Central Statistics Bureau. The rolling stock in Java owned by PJKA is shown in Table I(B)-18. During the period from 1980 to 1983, the number of locomotive increased by about 10% to 613 in 1983, largely shifting from steam to diesel power. The number of freight cars increased only slightly to about 4,200 in 1983 while that of passenger cars decreased by a great amount of about 30% to about 660 in 1983 during the same period.

As of the rail transportation, the freight traffic in West Java is shown in Table I(B)-19 and the passenger traffic in Java is shown in Table I(B)-20. The freight traffic in

Table I(B)-18 PJKA ROLLING STOCK IN JAVA

		1980	1981	1982	1983
Locomotives	Steam	118	94	61	48
	Diesel	381	401	450	501
	Electric	49	40	40	64
	Total	548	535	551	613
Freight Cars		4,115	4,108	4,183	4,171
Passenger Cars		906	920	655	655

Source: Railway Statistic 1983 (Biro Pusat Statistik).

Table I(B)-19 FREIGHT TRAFFIC IN WEST JAVA

Year	Freight Loaded (10 ⁶ ton)		Ton - km (10 ⁶)		Average Haul (km)	
	West Java	Indonesia	West Java	Indonesia	West Java	Indonesia
1977	1.04	3.82	262	853	252	223
1978	1.11	4.50	303	1,015	273	226
1979	1.04	5.17	206	1,021	199	197
1980	0.93	4.86	189	961	204	198
1981	0.87	4.97	180	970	207	195
1982	0.68	4.70	161	885	236	188
1983	0.59	5.07	118	916	199	181

Source: Railway Statistics (Biro Pusat Statistik) 1983.

Table I(B)-20 PASSENGER TRAFFIC IN JAVA

Year	Passenger Embarked (10 ⁶ ton)		Passenger-kilometer (10 ⁶)		Average Travel Distance (km)	
	Java- Madura	Indonesia	Java- Madura	Indonesia	Java- Madura	Indonesia
1977	21	23	3,460	3,809	165	166
1978	29	31	4,306	2,759	149	154
1979	37	40	5,142	5,758	139	144
1980	38	42	5,410	6,088	142	145
1981	40	43	5,537	6,166	138	143
1982	41	44	5,705	6,293	139	143
1983	43	46	5,573	6,105	130	134

Source: Railway Statistics (Biro Pusat Statistik) 1983.

West Java has been steadily decreasing while that in Indonesia is increasing. A large increase is actually recorded in Sumatra. The passenger traffic in Java, on the other hand, increased by more than 100% during the period of six years from 1977. In fact, the railway network in Sumatra is hardly utilized for passenger traffic. The average travel distance by passengers has been decreasing also during the same period to about 130 km in 1983.

During the past Repelitas, the rehabilitation and development of railways received special attention since the cost saving and energy conserving features of this mode of transportation have been widely recognized. Although the budget was a very limited, the achievement during the Repelita III was very significant according to the Repelita IV, as shown below:

Rehabilitation/Maintenance

Railways	1,595 km
Steam Locomotives	42
Diesel Locomotives	593
Electric Locomotives	72
Diesel Railcars	79
Passenger Cars	1,532
Freight Cars	11,294

New Purchase

Diesel Locomotives	77
Diesel Railcars	112
Electric Railcars	60
Passenger Cars	360
Freight Cars	400

Rail Transport

Passenger Traffic	annual rate of increase	8.3%
Freight Traffic	annual rate of increase	2.3%

Table I(B)-21 summarizes the annual expenditure from 1977 to 1983. The sudden increase of expenditure during the years of Repelita III, FY 1979/80 - 1983/84, is very clearly indicated. While the expenditure on track was steady, a large amount of investment on rolling stock in 1982 dominated all others.

The target of development in the Repelita IV is as follows:

Rail Transport

Passenger Traffic	annual rate of increase	14%
Freight Traffic	annual rate of increase	21%

Table I(B)-21 CAPITAL EXPENDITURE BY ITS KIND

(Rp. 1,000)

Year	Expenditure on Rolling Stock			Total	Expenditure of track & right of way	Other Expenditure	Total Expenditure
	Locomotive	Freight & Pax. cars					
1977	1,100	38,415		39,525	-	319,237	358,762
1978	593,233	238,233		831,466	59,273	5,977,799	6,868,538
1979	8,628,201	1,680,604		10,308,805	1,016,924	6,683,622	18,009,351
1980	5,289,416	4,733,542		10,022,958	1,624,032	11,178,967	22,825,957
1980 (Revised)	1,912,098	16,110		1,928,208	1,800,506	15,275,356	19,004,070
1982 (Revised)	31,856,570	22,730,304		54,586,874	1,657,943	14,074,234	70,319,051
1983 (Provisional)	21,532	65,549		87,0871	15,255	472,183	574,419

Source: Railway Statistic 1983 (Biro Pusat Statistik)

Rehabilitation/Maintenance

Railways	4,020 km
Bridges	423
Viaducts	50,796 m
Diesel Locomotives	207
Electric Locomotives	127
Passenger Cars	2,000
Freight Cars	15,599

New Purchase

Locomotives	25
Passenger Cars	210
Freight Cars	200

2) Railway in study region

In the study region, there is, as shown in Fig. I(B)-2, only one railway, about 150 km long, running from Jakarta to Merak through Tanah Abang, Rangkasbitung, Serang and Cilegon, under the control of PJKA. From Cilegon, a line branch off to Cigading, a new coal unloading port. The railway is a double track from Jakarta station to Tanah Abang station for a length of over 10 km, but the rest until Merak is, according to PJKA, a single track with the following specification:

Gauge	3'6"
Length of loop	Max. 510 m Min. 200 m
Ingredient	7%
Minimum curvature	200 m
Weight of rail	33.4 kg/m
Rail length	50 - 60 m
Sleeper & spacing	2.1x22.0x0.12m @0.68 m
Signaling	Mechanical
Maximum permissible Axle Load	12 tons
Maximum permissible speed	60 km/h
Number of train per day	Passenger 4 Freight 4

Table I(B)-22 shows the inventory of locomotives assigned to the Jakarta - Merak line. There are 47 locomotives, apparently all diesel powered, or about 9% of that in Java. There are 211 freight cars of 5% of that in Java, as shown in Table I(B)-23, also assigned to this line.

There are two other branches, namely Rangkasbitung - Labuan line of about 56 km long and Cilegon - Anyer Kidul line of about 21 km long. Train operations in these branch lines are now terminated and the facilities are abandoned and left rotting. There is no plan to rehabilitate those according to PJKA.

The condition of only one operating line, however, is but left in a deteriorating stage. The condition of tracks between Tanah Abang and Merak, according to PJKA, is rated as follows as of September 1985. (The satisfactory point being 100%)

Rail	75%
Sleeper	85%
Fastening	70%
Ballast	20%

The poor condition of tracks together with old-fashioned signaling and other facilities are main causes of slow limitation of speed. PJKA, however, is making intensive effort to improve present condition within its limited budget. Its budget for 1985/1986 amounted to about Rp. 50,00,000 for ordinary maintenance and in addition to this, the special fund of over Rp. 20,00,000 is allocated for the implementation of rehabilitation programs on this line.

Table I(B)-22 LOCOMOTIVES ASSIGNED TO JAKARTA-MERAK LINE

Series Number	Year of Make	Maker	Inventory		
			In-use	Maintenance/Repair	Not In-use
BB 303	1973/1984	Henschel (West Germany)	7	1	1
BB 306	1984	Henschel (West Germany)	7	1	-
BB 304	1976/1984	Krupp (West Germany)	7	1	1
C 300	1967	Karl Marx (East Germany)	12	1/3	5

Source: PJKA, September 1986

Table I(B)-23 FREIGHT CARS ASSIGNED TO JAKARTA-MERAK LINE

Type	Number	Country	Inventory		
			In-use	Maintenance/Repair	Not In-use
Flat	116	Romania	6 (sets)	14	4
Half-Box	40	Romania	40	-	-
Box	30	Romania	30	-	-
Half-Box on 2 Axle	25	Czechoslovak	25	-	-

Remark: 1 set consists of 17 cars in standard pay.

Source: PJKA, September 1986

Train operation is carried on 24 hour a day basis and at present there are every day 10 passenger trains, 5 returns, including one return from Solo to Merak. There are 22 freight trains, 11 returns, daily mostly until Krenceng and only one return reaching Merak. It is clear that the line is utilized more for cargo movement than for passenger movement.

At the Merak terminal, the train operation is connected by a six hours ferry service to Panjang in Sumatra and by rail, about 5 km, from there to Bandar Lampung. There are currently four services, two returns, daily. Table I(B)-24 represents the movement of passengers and cargo at Merak both for train and ferry.

3) Recent development in the study region

A proposal on a railway rehabilitation program is under consideration by the Department of Communication for the Jakarta - Cigading Section as shown in Fig. I(B)-10. The proposal was submitted by Davy British Rail International (DRBI) in March 1986 for the transportation of coal from Cigading to Cibinong by rail after an extensive study in the previous years. The study called for the following phased rehabilitation/new railway construction program for the transportation.

Phase I (1986 - 1988): The Container Solution

To secure a transportation route of Cigading - Bekasi by railway and then on by road, upgrading of the whole line with R 14 A rail and permissible axle load to be 15 tons.

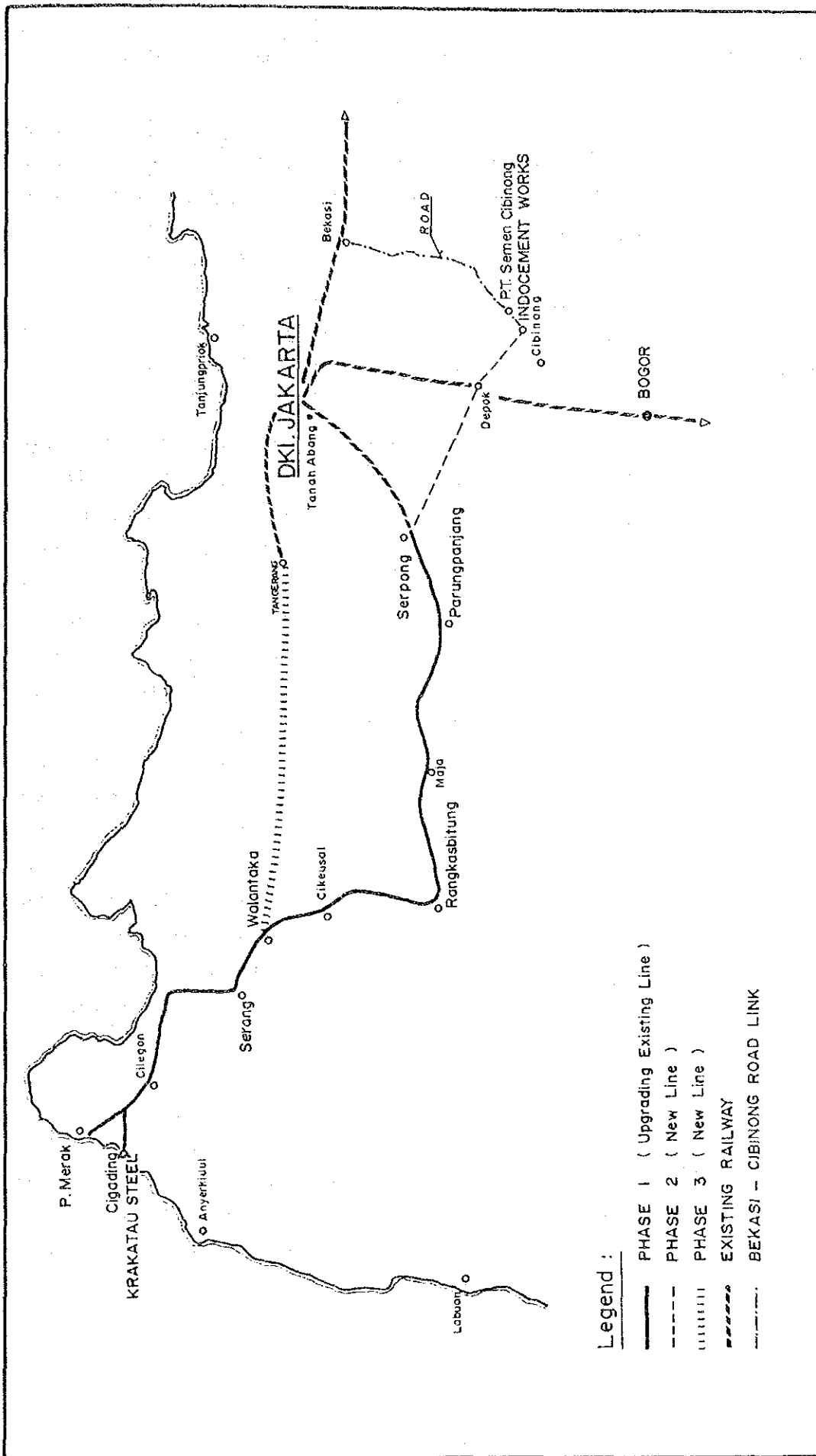
Phase II (1988 - 1990): The Wagon Solution

Recommendation of a new railway link from Serpong to Cibinong,

Table I (B)-24 PASSENGER AND CARGO MOVEMENT AT MERAK

Year	Passenger				Cargo				Total Mil.Rp.	
	Train		Ferry		Train		Ferry			
	No.	Mil.Rp.	No.	Mil.Rp.	Ton	Mil.Rp.	Ton	Mil.Rp.		
1980	78,241	69	400,838	289	883	4	95,838	317	21	700
1981	82,521	75	349,448	260	5,921	38	68,799	241	22	636
1982	71,473	88	177,386	197	4,160	22	39,031	88	17	412
1983	62,836	100	94,789	126	4,069	16	28,552	72	9	323
1984	57,321	122	62,069	109	26,508	125	30,265	90	21	467
1985	50,959	111	50,907	82	39,525	238	17,373	53	24	508

Source: Merak Station Statistics



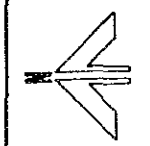
Legend :

- PHASE 1 (Upgrading Existing Line)
- PHASE 2 (New Line)
- ||||| PHASE 3 (New Line)
- ==== EXISTING RAILWAY
- - - - BEKASI - CIBINONG ROAD LINK



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Fig. I (B) -10
 CURRENT PROPOSAL FOR
 THE TRANSPORTATION OF COAL



Phase III (1990 - 1995): Long Term Development

Recommendation of a 120 km/hour passenger transportation service between Jakarta and Merak incorporated with a new railway construction between Tangerang and Walantaka.

1.4 Sea Transportation and Ferry

1) Port

Apart from the private ports of industries along the coast of Merak - Anyer, there is no public port on the coast of the study region. Table I(B)-25 summarizes the cargo movements at the ports of Merak and Cigading in the study region and Panjang in the Lampung Province. The Merak port is exclusively used for domestic cargoes and handles agriculture products, chemical products, estates products, metal, etc. The Cigading port handles both domestic and international cargoes. The domestic movement is dominated by the unloading of logs and petroleum products, but the rest is shared by the industry related cargoes such as mining, metal, chemical, etc. The international movements are shared by mentals and chemicals but the majority is classified as others although the international unloading of this port amounts to about 10% of that of the whole Indonesia. The Panjang port handles domestic cargoes of petroleum, chemical, agriculture and estates products among others and international cargoes of agriculture and estates products as the major ones.

There are only minor moorages at river mouth and estuary for fishing apart from those private ports. These moorages are not reliable due to sedimentation and shifting sand bars and not suitable for movement of boats carrying people and commodities.

Table I (B)-25. CARGO LOADING AND UNLOADING IN 1984

(Ton)

Commodity	Merak (Domestic only)		Cigading		Panjang		Indonesia			
	Loading	Un-loading	Domestic	International	Domestic	International	Domestic		International	
							Loading	Un-loading	Loading	Un-loading
Agriculture	49,748	360,625	51,108	6,776	205,106	21,144	1,660,175	1,911,604	1,193,042	2,414,522
Estates Products	29,428	6,571	3,158	43,042	197,938	8,592	1,987,200	1,853,356	2,222,886	63,642
Livestock				437		280	47,662	17,869	4,079	875
Fishery	4,240	10,464					111,379	65,304	48,118	852
Petroleum & Natural Gas	66	22	170,273				329,596			
Mining/Quarrying Products			30,250	50,649			23,253			
Metal	26,766	12,843	56,236	16,246	69,161	50,896	27	1,367	2,976	23,232
Non Metal & Products			4,560				150			
Machinery/Electric/ Optic			11,377	3,012	163	5,757	1,461	981	481	2,940
Chemical & Products	53,604	4,815	15,958	48		141,393	976	148,787	955	8,335
Textiles	8,902	239								
Other Handicrafts										
Food & Products	7,256	986					100	100	3,199	3,199
Forestry							30	150	11,937	
Miscellaneous							416	492	1,848	
Others	584,285	292,066	118,909	118,445	1,259	1,017,091	534	18,178	242	13,261
Grand Total	744,295	688,631	237,290	527,203	70,583	1,219,256	57,960	573,159	421,483	98,439
								30,929	292	47,670
								213	66,801	569
								12,426	755	

Source: Cargo Loading and Unloading at Ports in Indonesia 1984 (Biro Pusat Statistik).

The Directorate General of Sea Transportation does not at present manage any of the ports or moorages in the study region and consequently has no financial statement. However a new port construction project is being carried out at Ciwandan, located near Cigading between Cilegon and Anyer. This port will comprise the following facilities:

1 Wharf	122 m length for 10 m drought
2 Dolphins	10,000 DWT Capacity
1 Open Storage Yard	19,500 m ²
1 Access Road	7 m x 1,000 m
1 Office	500 m ²
1 Electricity, Telephone, etc.	

The port is planned to be opened to the public in July 1987 as a general cargo and passenger movement handling facility.

2) Ferry

There is a ferry port at Merak to serve as a connection with Bakauhuni in Sumatra in 1 hour 40 minutes, controlled and managed by the Directorate General of Land Transport and Inland Waterways.

The ferry departs every hour alternatively from No. 1 and No. 2 berths. Five companies are operating with a total fleet of nine ferry boats ranging from 300 ton to 1,300 ton D.W.T. Major cargo from Java through Merak consists of industrial product, consumable commodities and from Sumatra through Bakauhuni the cargoes are agricultural products according to the statistics of port office. Table I(B)-26 shows the volume of traffic through this port.

Table I(B)-26 PASSENGER AND VEHICLE MOVEMENT AT
MERAK-BAKAUHUNI FERRY

Year	Passenger	Car
1976	1,604,211	9,314
1977	2,379,308	23,650
1978	2,677,547	48,377
1979	3,104,447	65,242
1980	3,271,570	103,132
1981	3,034,975	142,533
1982	2,761,640	231,278
1983	3,761,384	336,110
1984	4,516,669	415,812
1985	4,409,049	484,411

During the ten year period between 1976 and 1985, the passenger traffic grew about 3 times and motorcars by more than 50 times. Caused by this explosive increase of traffic, a comprehensive study for the expansion of port facility was implemented and the result was just submitted in July 1986 as a Master Plan for Bakauhuni - Merak Ferry Terminals Project.

Table I(B)-27 shows the recommendation in the Master Plan until the long term target of Year 2015. There are to be 3 berths to cater for 5,000 GT ferries and one for 2,000 GT. The terminal area is recommended, including the railway yard and facilities, to be completely modified to increase the handling capacity, enough to meet the gigantic demand.

TABLE I (B)-27 VEHICLE TRAFFIC DEMAND AND SERVICE CAPACITY IN FUTURE

Description	Ferry Component								Remarks
	No. 1 Berth	No. 2 Berth	No. 3 Berth	No. 4 Berth	Service Capacity (vehicle)	Demand (Vehicle)			
Year	2,000 GT	3,000 GT	5,000 GT	5,000 GT	5,000 GT	5,000 GT			
	Less than 2,000 GT								
1986	6	2			457,000	605,000			
1987	6	2	2		937,000	800,000			
1990	6	2	2	1	1,157,000	1,148,000			
1993	6	2	2	2	1,415,000	1,400,000			
1995	6	2	2	2	1,719,000	1,606,000			Procurement of 4 - 5,000 GT boats and
2000	6	2	2	2	2,023,000	2,000,000			construction of two terminals of
2005	6	2	2	2	2,327,000	2,358,000			Berth No.3 are made under the Short
2015	6	2	2	2	2,631,000	2,678,000			Term Plan.
2015	6	2	2	2	2,935,000	2,678,000			

Source: Master Plan for Bakauhuni - Merak Ferry Terminals Project (Dit. Gen. Land Transport and Inland Waterways)

Fig. I(B)-11 represents the short term plan of Merak 1995 where a third berth is to be constructed to cater for 5,000 GT ferry. The total cost estimated in the Master Plan was Rp. 62.5 billion in 1986 price. By that year, the Jakarta - Merak Highway is to be completed, according to JASA MARGA, and the projection by the Master Plan has a strong possibility to be realized.

There is another plan to link the two islands of Java and Sumatra by either a tunnel or bridge. A tunnel scheme is for a railway/car-train project and a bridge scheme is for the uses of both railway and road. The former project is said to be about five times more economical than the latter one. Their progress is not at the time being predictable since a project of this magnitude will be affected by many national level factors.

1.5 Air Transportation

There is no civil aviation facility in the study region. Those few located around the study region is shown in Table I(B)-28, except the one at Bogor which is exclusively used by the Air force.

Table I(B)-29 shows the number of civil aircraft registration. The total number increased by approximately 40% in the period from 1976 to 1984. In 1984, there were about 800 aircraft, of which 206 were helicopters. The ownership of helicopters were 70% private and the rest government in the same year.

Table I(B)-30 summarizes the air traffic to and from the Branti airport at Tanjungkarang, Lampung Province, in 1984. The Jakarta connection shares almost all the traffic followed by the Palembang one. The one for Curug probably is an exceptional. Garuda Indonesian Airways, the national flag carrier, services three returns daily by Fokker F-28 series with one and a half hours flight.

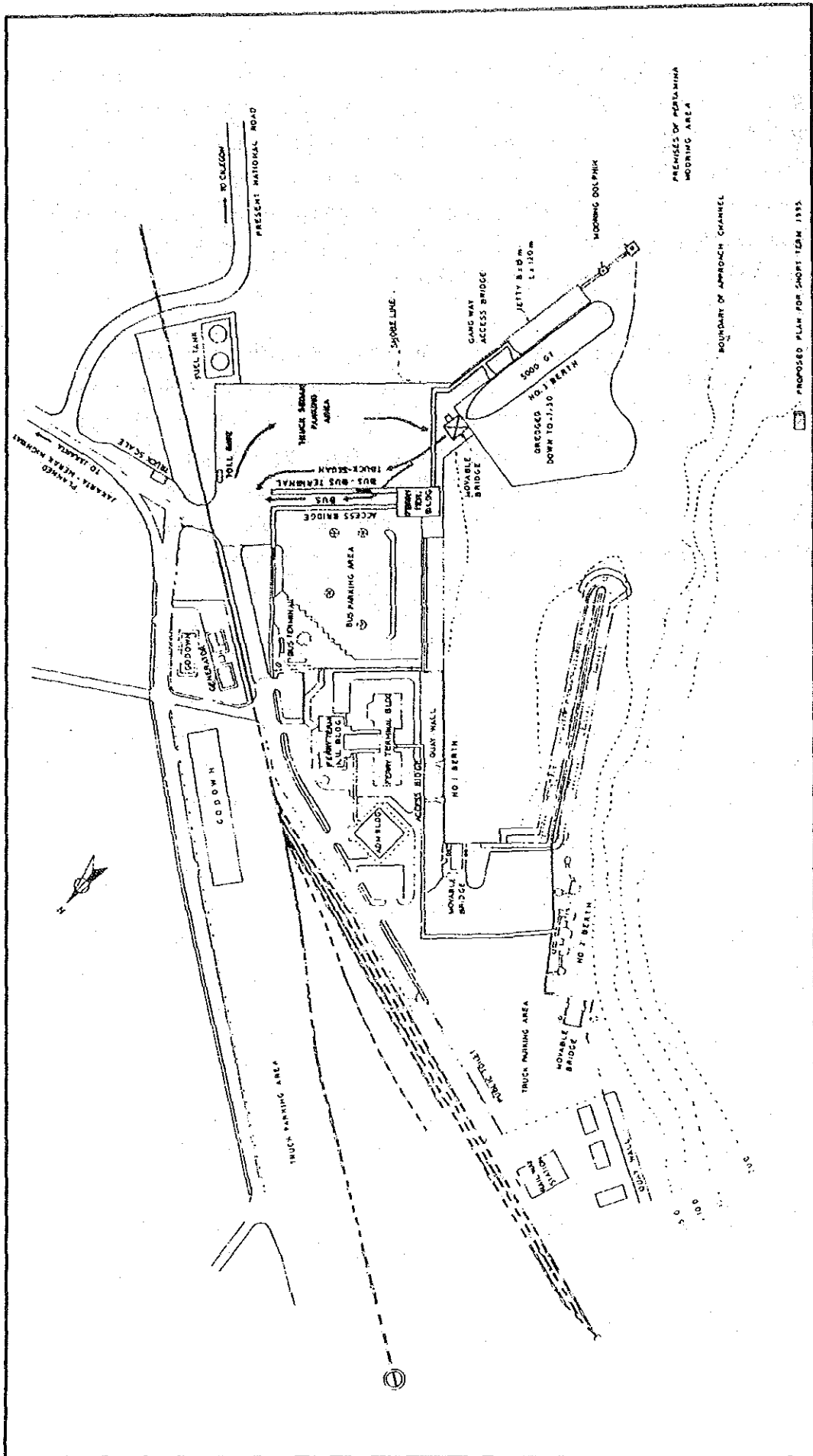


Fig. I(B)-11
 SHORT TERM PLAN OF MERAK IN 1995

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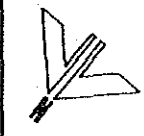


Table I(B)-28 CIVIL AVIATION FACILITIES AROUND THE STUDY AREA

Airport	Coordinate	Elevation	Runway		Taxiway	Apron	Terminal	Navigation Facilities	Ground Facilities	Operation	Target	
			Number	Dimension								Capacity
Soekarno-Hatta /Jakarta	06.07.05-s 106.39.09-E	34 Ft	07-25	3,660x60 3,050x60 (m)	B 747 B 747	Concrete	3,060x23 3,660x23	Many	AFIS, APP, ACC, VOR, DVOR, DME, RADAR, ILS	RESC-CAR, CRASH-CAR, COMM-CAR, AMBULANCE, TANK-CAR	24/h Civil General	B 747
Halim Perdana Kusuma /Jakarta	05.15-s 106.11-E	26 m	06-24	3,000x60	B 747	Asphalt Concrete	710x125 313 m ² 20,302 m ²	224 m ² 313 m ² 20,302 m ²	AFIS, NDB, VOR, DVOR, DME, RADAR, ILS	RESC-CAR, CRASH-CAR, COMM-CAR, AMBULANCE, TANK-CAR	24/h Civil Spe Military	B 747
Husein Sastra Negara /Bundung	06.54-s 107.35-E	741 m	11-29	1,959x45	F-28	Asphalt Concrete	2,476x18	210x115 400 m ²	NDB, VOR, DVOR, DME	REST-CAR, CRASH-CAR, AMBULANCE	23:00-11:00 Civil General	F-28
Budiarto /Tangerang /Curug	06.18-s 106.30-E	46 m	12-30	1,650x45 1,600x45 1,040x30	F-27	Asphalt	210x20 401x20 360x20 150x40 150x40	160x160 100x60	DVOR, DME, RADAR, SSB, NDB, VHF	REST-CAR, CRASH-CAR, COMM-CAR	23:00-11:00 Training	F-27
Branti /Tanjungkarang	05.15-s 105.11-E	86 m	14-32	1,520x3-	F-28	Asphalt	128x23	80x124 978 m ²	AFIS, NDB, VOR, DVOR, DME	REST-CAR, CRASH-CAR, COMM-CAR, AMBULANCE, TANK-CAR	23:00-11:00 Civil General	F-28

Source: DIT. GEN. Air Transportation

Table I(B)-29 NUMBER OF CIVIL AIRCRAFTS REGISTERED

Year End	Fixed Wing (M.T.O.W.)		Helicopter	Total
	10,000 kg and over	Less than 10,000 kg		
1976	153	256	167	576
1977	157	276	165	598
1978	162	290	158	610
1979	166	288	166	620
1980	187	300	169	656
1981	202	335	178	715
1982	223	357	182	762
1983	229	365	187	781
1984	218	364	206	788

Source: Air Transport Statistics 1984 (Biro Pusat Statistik).

Note: M.T.O.W. -- Maximum Take Off Weight.

Table I(B)-30 AIR TRAFFIC FROM TANJUNG KARANG IN 1984

Origin & Destination	Passenger	Cargo (kg)	Baggage (kg)	Mail (kg)
(from) Tg. Karang	55,979	66,757	142,215	49,429
(to) Curug	30	-	-	-
Jakarta	55,158	66,222	139,526	49,429
Palembang	791	535	2,689	-

Source: Air Transport Statistics 1984 (Biro Pusat Statistik).

CHAPTER 2 TELECOMMUNICATION

2.1 Organization

The Directorate General of Post and Telecommunication, Department of Tourism, Post and Telecommunication is the authority responsible for telecommunication management in the Republic of Indonesia. The Directorate General of Post and Telecommunication consists of four divisions, Administration, Post, Telecommunication and Frequency.

The following four enterprises are appointed by the government to manage the post and telecommunication services.

- (1) PERUM POS DAN GIRO : Post management enterprise
- (2) PERUMTEL : Domestic telecommunication enterprise
- (3) PT INTI : Telecommunication machinery production enterprise
- (4) PT INDOSAT : International telecommunication enterprise

2.2 Existing Telecommunication Facilities

As Indonesia consists of so many islands, telecommunication is considered as one of the basic infrastructures for national development. Satellite communication has been mainly adopted for the most distant archipelagos. The satellite Palapa⁴ was launched on the orbit in cooperation with ASEAN countries and 132 large and small earth stations were constructed.

Note /1 The name of Palapa was inspired by an oath by Gajah Mada, a prime minister in the ancient Majapohit Kingdom. In his oath, he promised not to take rest before the whole archipelago was unified.

In addition to the satellite system, a Java-Bali microwave communication system was built and afterwards expanded to Sumatra and the eastern regions of Indonesia as far as Ujung Pandang.

One hundred and five towns in Indonesia can be reached by direct dialing long distance telephone facilities at present.

The study region is connected with Jakarta and Sumatra by microwave. The telephone exchanges distributed in main cities in the study region are still of the analogue type except for the digital system in Serang city [see Fig. I(B)-12 and Table I(B)-31]. Although the capacity of the exchanges is adequate a present enough, the increasing demand for telephones in the capital of Kabupatens and the industrial city of Cilegon requires the development of new exchanges.

As for telex facilities in West Java, there is only one telex exchange with 500 connections located in Bandung.

2.3 Future Development Plan

The modernisation program for telephone facilities directed by the Directorate General of Post and Telecommunication has six phases of which phases I to IV have already been carried out and the phases V and VI are presently in progress.

In the study region, not only are construction of microwave towers under construction but digital exchanges are scheduled to provide a more reliable and convenient telecommunication system [see Table I(B)-32].

The new microwave towers in Cilegon, Serang, Pandeglang and Rankasbitung may be connected with the existing microwave tower on Mt. Pinang near Cilegon and digital communication between the study region and the capital could easily be realized within a few years.

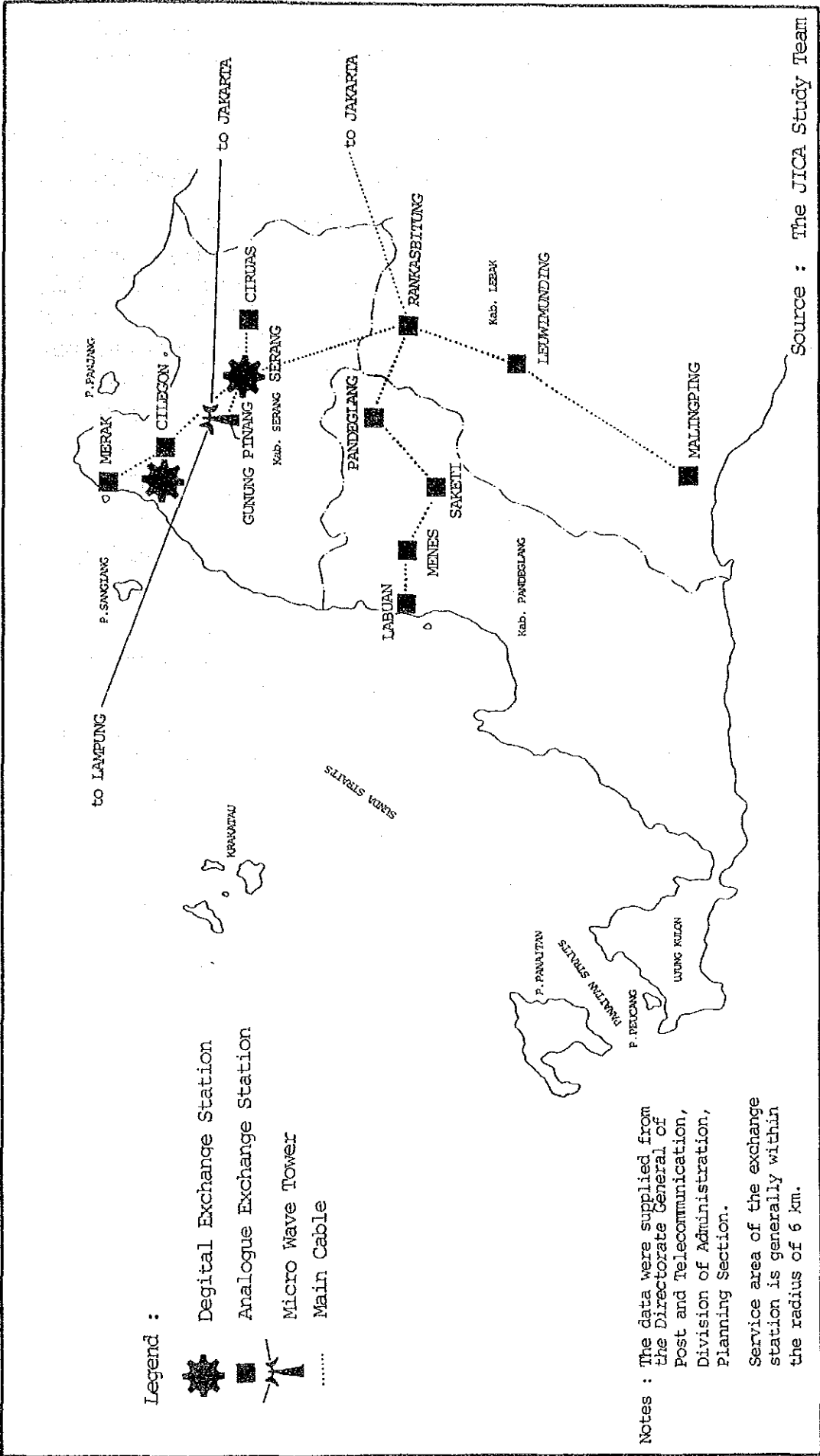

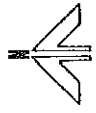


Fig. I (B) -12
EXISTING TELEPHONE NETWORK

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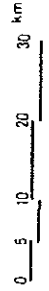


Table I(B)-31 EXISTING TELEPHONE EXCHANGE STATIONS
IN THE STUDY REGION

Station	Capacity of Exchange	Number of Subscriber	Year of Construction	System of Exchange
Serang	1,380	1,120	1983	Digital Exchange
Pandeglang	400	313	1972	Analogue Exchange
Cilegon	400 /1	295	1972	Digital & Analogue Exchange
Labuan	150	92	1967	Analogue Exchange
Menes	40	27	1960	- dit -
Merak	120	79	1974	- dit -
Rankasbitung	600	567	1973	- dit -
Lewinunding	20	10	1956	- dit -
Malingping	50	32	1959	- dit -
Ciruas	30	19	N.A.	- dit -
Saketi	20	11	1972	- dit -

Remark: /1 A digital exchange was already installed in the Cilegon Industrial Estate.

Source: Directorate General of Port and Telecommunication, Division of Administration, Planning Section

Table I(B)-32 CONSTRUCTION PLAN OF DIGITAL EXCHANGES
IN THE STUDY REGION

(Unit: lines)

Exchange	Phase V ^{/1}	Phase VI ^{/2}	Total
Serang	-	1,000	1,000
Pandeglang	1,000	1,000	2,000
Cilegon	1,000 ^{/3}	1,000	2,000
Merak	-	500	500
Rankasbitung	1,000	-	1,000
Total	3,000	3,500	6,500

Remarks: ^{/1} Phase I - IV already implemented by 1985.
^{/2} Phase V and VI are scheduled to be implemented within the period of Pelita IV.
^{/3} The digital exchange was partly constructed in Cilegon Industrial Estate during Phase II.

Source: Directorate General of Post and Telecommunication,
Division of Administration, Planning Section

CHAPTER 3 WATER SUPPLY

3.1 Present Condition of Water Supply System

1) Domestic water

The Regional Water Supply Enterprise (PDAM) and Drinking Water Enterprise (BPAM) are handling water supply service for domestic use in the study region, Kab. Serang and Kab. Pandeglang.

PDAM controlled by the Department of Interior, has served many cities since 1885.

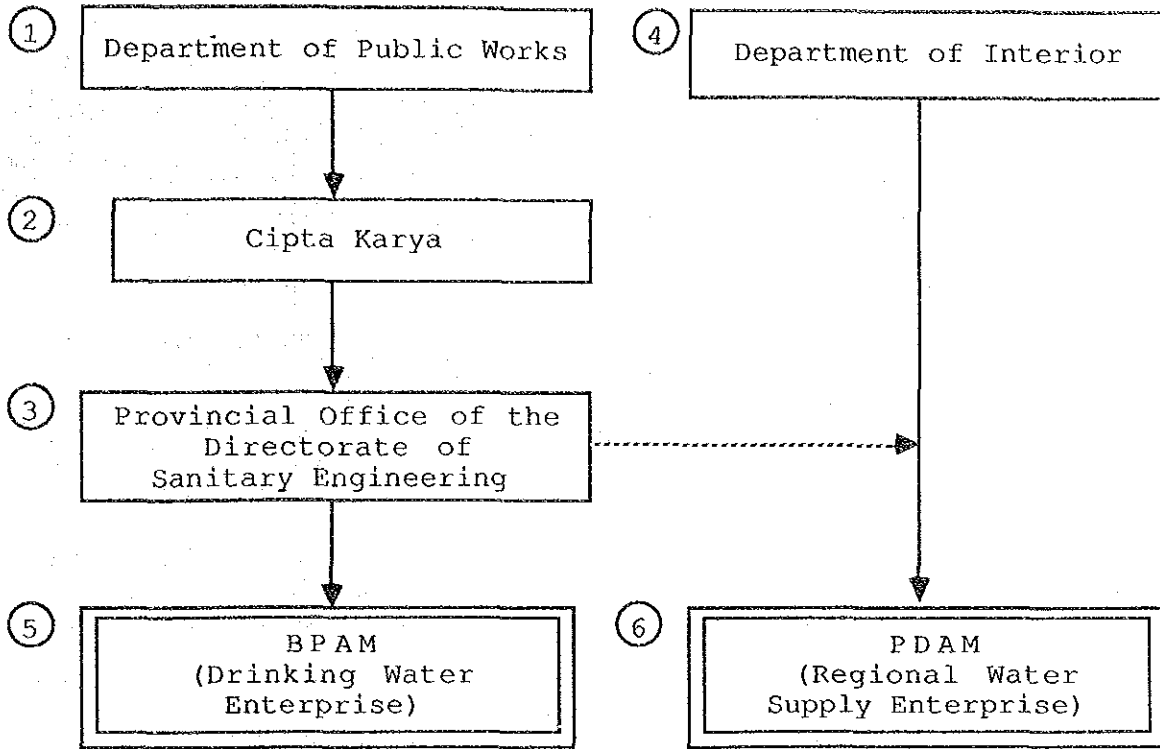
BPAM, the public water service system controlled by Cipta Karya, has lately started to provide of small scale water supplies for domestic use in Kab. Pandeglang. Fig. I(B)-13 shows the organization chart for the water supply system.

Tables I(B)-33 and I(B)-34 show the present condition of the domestic water supply service in Kab. Serang and Kab. Pandeglang.

The principal services in the study region consists of 50 lit/sec for 5,200 households in Serang city, 31 lit/sec for 1,500 households in Pandeglang city, 20 lit/sec for 1,000 households in Labuan city and 20 lit/sec for 900 households for Cilegon city.

The ratio of water service population to the total population by PDAM and BPAM is 25% in Serang city, 17% Pandeglang city and 11% in Labuan city, respectively. In the other minor towns, most households are dependent on their own shallow wells in lieu of a public water supply service.

Fig. I(B)-13 ORGANIZATION FOR THE WATER SUPPLY SYSTEM



Remarks: Two authorities are undertaking the water supply in the study region independently. BPAM will be incorporated in PDAM as soon as stabilization is achieved.

Source: JICA Study Team

Table I(B)-33 PRESENT CONDITION OF WATER SUPPLY SERVICE
FOR DOMESTIC USE IN KAB. SERANG

(1986)

Service Area	Supplied Water Volume (l/sec)	Water Source	Treatment Plant	Facility Maintenance	Served House hold	
					Number	Ratio to total House hold
1 Kec. Tirtayasa	5.0	Irrigation Canal	○	PDAM ¹	360	3.2 %
2 Kec. Pontang	2.5	Irrigation Canal	○	PDAM	185	2.4
3 Kec. Ciruas	2.5	Kamayungan River & Irrigation Canal	○	PDAM	117	1.3
4 Kec. Cikande	2.5	Cidurian River	○	PADM	135	1.1
5 Kec. Carenangn	5.0	Irrigation Canal	○	PDAM	170	1.7
6 Kec. Bojonegara	2.5	Irrigation Canal	○	PDAM	102	1.0
7 Kec. Baros	5.0	Tapping from distribution pipe of Serang	—	PDAM	300	5.2
8 Kec. Cilegon	20.0	Cidanan River (Rawa Danau)	Krenceng Treatment Plant of Krakatau steel works	PDAM	900	8.4
9 Kec. Serang ⁵	50 ⁴	Sukacai Spring ^{2, 3} & 4 boreholes	—	PDAM	5,216	24.8

- Remarks: /1 PDAM: Perusahaan Daerah Air Minum (Regional Water Supply Enterprise)
- /2 Sukacai Spring is located near the Kampung of Randucukrom on the foot slope of the Gunung Karang (17 km from Serang city). Four boreholes which are located in Cipare yield 5.3 lit/sec of water at present.
- /3 80 lit/sec (maximum yield of 200 lit/sec) will be supplied in 1986 from Citaman Spring which located at Kampung Tamansari, 15 km from Serang.
- /4 30 lit/sec for domestic, plus 20 lit/sec for army, equal to 50 lit/sec (maximum yield 120 lit/sec).
- /5 The Serang water supply system was started in 1885 by PDAM

Source: PDAM in Serang; Master Plan Study on North Banten Water Resources Development, JICA, July 1983.

Table I(B)-34 PRESENT CONDITION OF WATER SUPPLY SERVICE
FOR DOMESTIC USE IN KAB. PANDEGLANG

(1986)

Area	Served Water Volume (ℓ/sec)	Water Source	Treatment Plant	Maintenance authority	Served House hold	
					Number	Ratio to total House hold
1 Kec. Pandeglang	6.0	Ciaseni spring & Ciwasiat Spring	—	PDAM ⁴⁵	306	Total 17.2%
2 Kec. Pandeglang ⁴³	25				Karang Tanjung Spring	
3 Kec. Labuan ⁴⁴	20	Cidangur River	○	BPAM	1,051	11.1
4 Kec. Cadasari	2.5	Karang Tanjung Spring	—	BPAM	30	0.3
5 Kec. Cimanuk	2.5	Cimanuh River	○	BPAM	92	1.2
6 Kec. Menes	5.0	Deep Well	—	BPAM	125	1.4
7 Kec. Bojong	2.5	Cilemer River	○	BPAM	168	1.6
8 Kec. Pagelaran	2.5	Cisata River	○	BPAM	88	0.5

- Remarks: /1 The water supply in Pandeglang City was commenced in 1938. Four hours/day service are carried presently except for hospital, army and governmental use.
- /2 Karang Tanjung Spring is located at about 2 km northeast from the Pandeglang city.
- /3 BPAM started in Pandeglang in 1983 with 79 households and 6 hours/day
Service: 16 hours/day at present
- /4 BPAM started in Labuan at 1982 with 14 households and 6 hours/day
Service: 12 hours/day at present
- /5 TPDAM: Perusahaan Daerah Air Minum
- /6 BPAM; Badaan Penglang Air Minum

Source: BPAM, PDAM

2) Industrial water

Industrial water for the Cilegon Industrial Estate, located in the western part of Cilegon city with a planned development area of 550 ha, is conveyed from the Cidanau river, 12 km south from Anyer city. A steel pipe of 1.4 m diameter of approximately 27 km long has been laid from the mouth of Cidanau river to the Krenceng reservoir (1.5 million m³) adjacent to Cilegon city.

Although the pump station installed near the weir in Cidanau river was designed to carry 2,500 lit/sec at full rated capacity, industrial demand was only 350 lit/sec in 1982.

Fig. I(B)-14 shows the present condition of the water supply system for domestic use and industrial use in the study region.

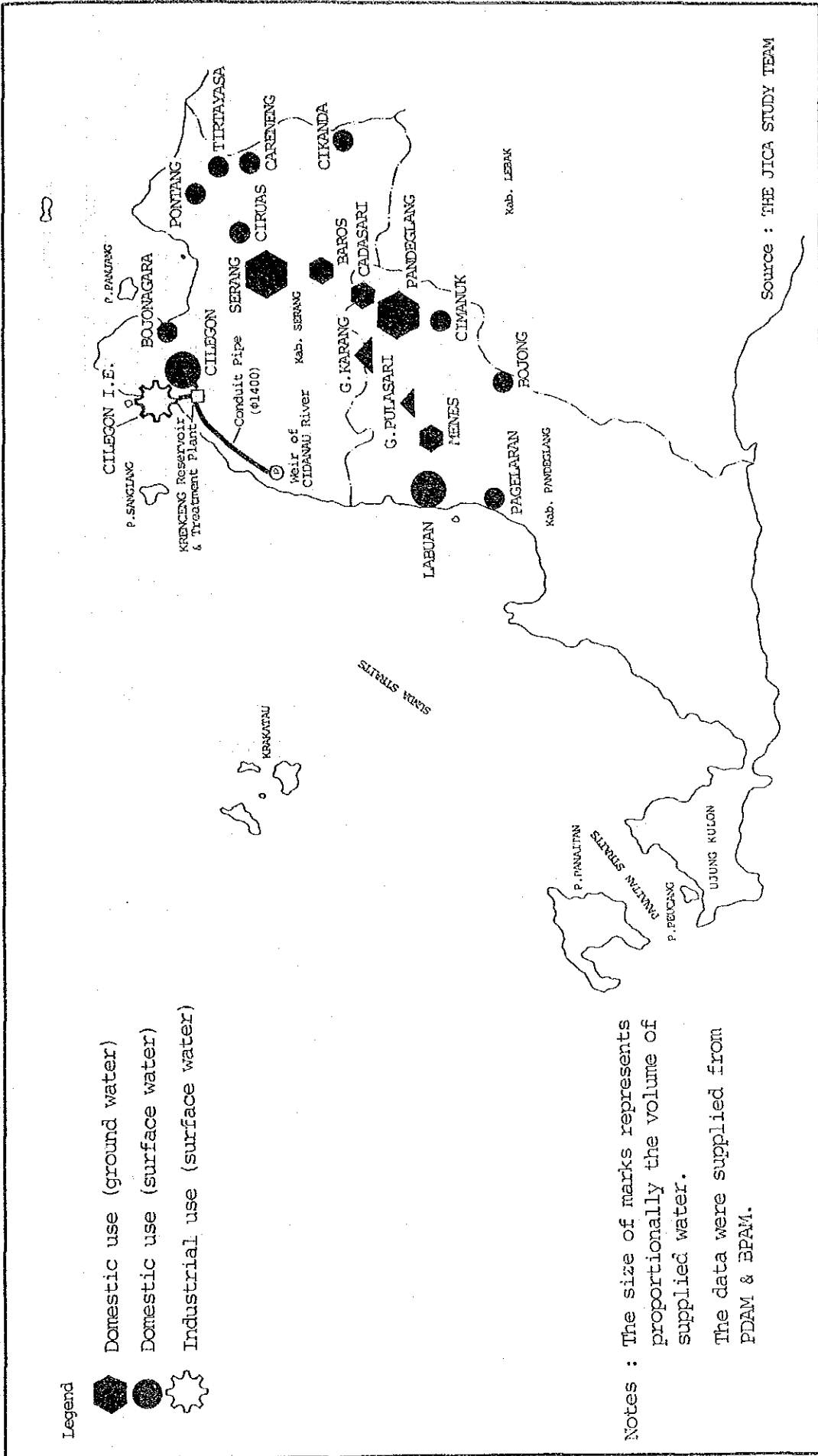
3) Agricultural water

The study region contains vast areas of paddy fields. Double cropping is widely practiced in well irrigated areas. Fig. I(B)-15 shows that agricultural water is required most particularly during the transplanting period in the dry season (June and July).




Most of the river water in the dry season is fully used for agricultural use in the study region.

4) Water for hotel use

The accommodation survey conducted by JICA study team has clarified that the water supply systems in the principal hotels except at Nusa Dua, Bali, depend on self-equipped wells [see Table I(B)-35].



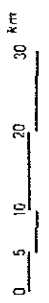
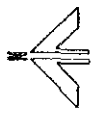
Legend

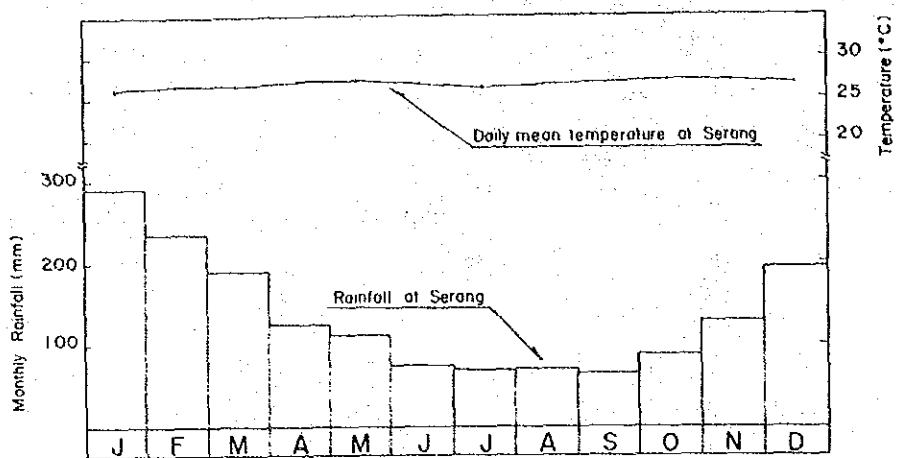
-  Domestic use (ground water)
-  Domestic use (surface water)
-  Industrial use (surface water)

Notes : The size of marks represents proportionally the volume of supplied water.
The data were supplied from PDAM & BPAM.

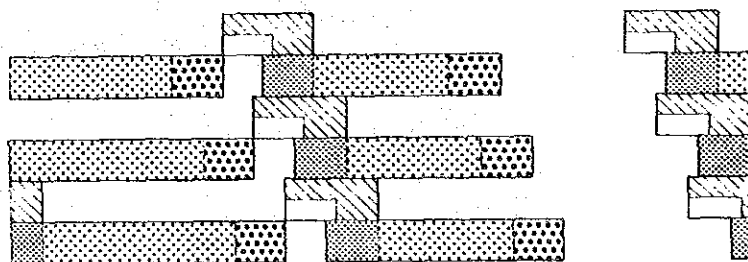
Fig. I (B)-14
DISTRIBUTION OF WATER SERVICE AREAS

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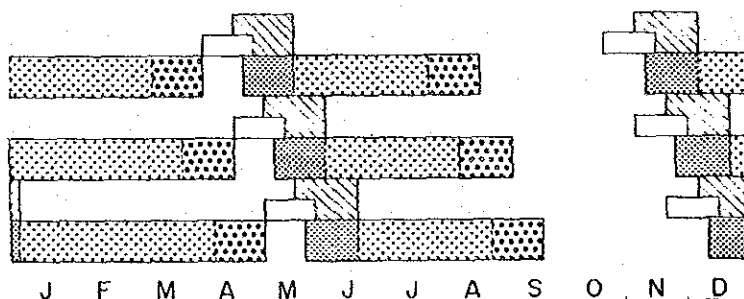




Large-scale Irrigation Schemes



Middle- and Small-scale Irrigation Schemes



Source : Master Plan Study on North Banten Water Resources Development, July 1983, JICA.

LEGEND

- Nursery
- Land Preparation
- Transplanting
- Crop Growing
- Harvesting



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Fig. I(B)-15
CROPPING PATTERS FOR PADDY

Table I (B) -35 RESULTS OF THE QUESTIONNAIRE SURVEY OF ACCOMMODATION ESTABLISHMENTS

Name of Hotel	Location	Water Source	Infrastructure				Independent Power Plants	Number of Rooms	Number of Guest per year in 1985
			Purification Plant	Sewage Treatment	Solid Waste	Private Purification Plant			
1. Anyer Beach Hotel	Kab. Serang	Private Borehole	216 m3/d op.cost 4.5 mil. Rp./y	Private Septic Tank, 150 m3	Dumped in the adjacent ground	Private Generator	62	21,500	
2. Carita Krakatau	Kab. Pandeglang (Labuan)	- dit -	-	Private Septic Tank	- dit -	- dit - con.cost 30 mil. Rp. in 1976	150	161,000	
3. Nusa Dua Beach	Nusa Dua Bali	BTDC	-	BTDC	Public service	Private Generator	450	182,200	
4. Putri Bali Hotel	- dit -	BTDC	400 m3/d (in 1984)	BTDC	Contractor	- dit -	376	20,200	
5. Hotel Bali Beach	Bali	Private Boreholes	2,100 m3/d (in 1965)	Septic Tank 695 m3	Carry to the public tip	Private Generator con.cost 70 mil. Rp. in 1965	563	214,100	
6. Bali Hyatt	Sanur Bali	Private Boreholes & public service	500 m3/d op.cost 40 mil. Rp./y in 1979	Aeration system (private)	- dit -	Private Generator in 1972	386	39,000	
7. Bualu Hotel	Nusa Dua Bali	N.A.	-	BTDC	BTDC	None	46	8,100	
8. Pertamina Cottage	Bali	Private Boreholes	650 m3/d op.cost 37 mil. Rp./y	Private Septic Tank & Penetration well	Public garbage dock & public service	Private Generator in 1974	178	72,800	
9. Hotel Bali Oberoi	- dit -	- dit -	None	Private Septic Tank	Public Service	None	74	5,800	
10. Bali Sanur Village	- dit -	Private Boreholes & public service	None	Private Storage Hole	Public Service	None	137	10,200	

Remark: BTDC: Bali Tourism Development Corporation

(to be continued)

Table I (B) -35 RESULTS OF THE QUESTIONNAIRE SURVEY OF ACCOMMODATION ESTABLISHMENTS

Name of Hotel	Location	Water Source	Infrastructure			Solid Waste	Independent Power Plants	Number of Rooms	Number of Guest per Year in 1985
			Purification Plant	Sewage Treatment	Private Purification Plant				
11. Hotel Indonesia Jakarta	- dit -	Private Boreholes & public service	Private	Private	Public Service	Private Generator in 1962	611	N.A.	
12. Borobudur	- dit -	- dit -	None	Private Septic Tank, 1,500 m ³	- dit -	Private Generator in 1973	860	263,000	
13. Toner Hotel	- dit -	- dit -	None	Private Septic Tank, 90 m & Storage Hole	- dit -	Private Generator op.cost 3 mil. Rp./y	215	115,200	
14. Mandarin Hotel	- dit -	- dit -	600 m ³ /d con.cost 143 mil. Rp. op.cost 13 mil. Rp./y	Private Septic Tank, 600 m ³ /d	- dit -	Private Generator con.cost 270 mil. Rp. in 1978	455	144,400	
15. Hotel Gajah Mada	- dit -	N.A.	N.A.	N.A.	N.A.	Private Generator con.cost 4.5 mil. Rp. in 1985	2,270	N.A.	
16. City Hotel	- dit -	Public Service	150 m ³ /d con.cost 5 mil. Rp. in 1981	Private Septic Tank, 40 m ³	Public service	Private Generator con.cost 20 mil. Rp. in 1978	196	26,200	
17. Hyatt Aryaduta Hotel	- dit -	Private Boreholes & public service	op.cost 0.5 mil. Rp./y 100 m ³ /d	Private Septic Tank, 255 m ³	- dit -	None	N.A.	68,400	
18. President Hotel	- dit -	N.A.	N.A.	N.A.	N.A.	N.A.	354	103,500	
19. Hotel Kartika Chandra	- dit -	Private Borehole	None	Private Septic Tank, 30 m ³	Public Service	None	141	4,500	
20. Sari Pacific	- dit -	Private Boreholes & public service	(75%) op.cost (25%) 44 mil. Rp./y	N.A.	- dit -	Private Generator in 1974	462	156,500	

Remark: BTDC: Bali Tourism Development Corporation

Based on the accommodation survey the water sources for hotel use in the study region are the following.

- Carita Krakatau Beach Hotel : Private deepwell
- Anyer Beach Hotel : Private borehole
- Peucang Island cottage : Shallow well
(Ujung Kulon)

3.2 Future Development Plan of Water Supply System

Tables I(B)-36 and I(B)-37 show the development plans for domestic water already authorized by PDAM and BPAM.

PDAM in Kab. Serang, with the aim of raising the water service ratio to 60 - 75% for the whole Kabupaten, plans to undertake new construction and/or expansion of existing facilities for the water supply system.

In Kab. Pandeglang, BPAM is planning to develop the water supply system as shown in Table I(B)-37. Cibaliung and Cikeusih cities will be connected to cities where well water is being used such as Pandeglang, Labuan and so on.

With the increase of industrial water projected in the Master Plan Study of North Banten Water Resources Development, the present supply from the Cidanau river of 2.5 m³/sec to the Cilegon Industrial Estate will be short in 2005. To satisfy new demands and assure well-balanced supply and demand for industrial water, the Directorate General of Irrigation of the Ministry of Public Works is envisaging the construction of new dams. Prospective sites being discussed are the Karian dam or the Cilawang dam near Rankasbitung and the dam near Rawa Danau on the Cidanau river [see Fig. I(B)-16].

Table I(B)-36 EXISTING DEVELOPMENT PLAN OF DOMESTIC WATER SUPPLY SYSTEM IN SERANG

Area	Contents of the plan
1. Kec. Cilegon	The Second stage development presently under construction for domestic water which has 30 lit/sec capacity.
2. Kec. Kramatwatu	New system is now under construction by the Department of Health: 5 lit/sec form springs
3. Kec. Pulomerak	New development scheme: 5 lit/sec form Kreceng reservoir for Suralaya Power Station in 1989/90 and its colony (500 houses).
4. Kec. Cikeusal	New Development scheme: 5.0 lit/sec in 1985/86 by PDAM
5. Kec. Anyer	New Development scheme: 10.0 lit/sec from springs or river (PDAM) in 1987/88
6. Kec. Mancak	New Development scheme: 2.5 lit/sec in 1985/86 (PDAM)

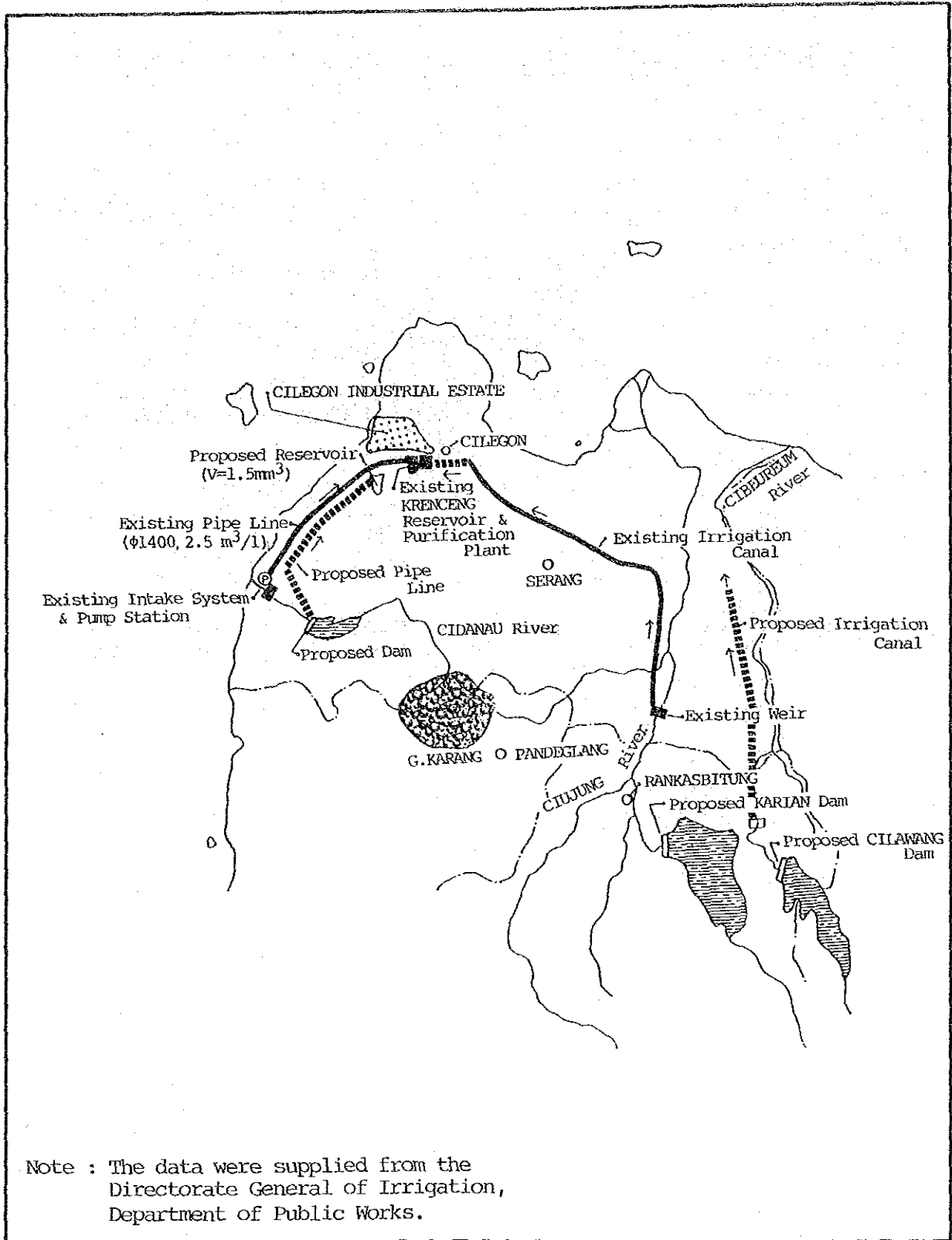
Remark: The water service ratio would be 75% in the urban area and 60% in the rural area according to the long-range plan of PDAM.

Source: PDAM

Table I(B)-37 EXISTING DEVELOPMENT PLAN OF DOMESTIC WATER SUPPLY SYSTEM IN KAB. PANDEGLANG

Area	Contents of the plan
1. Kec. Pandeglang	Expansion of existing facilities (BPAM) 25 lit/sec - 40 lit./sec in the year of 1988/89 1,300 households - 2,200 households in the year of 2000.
2. Kec. Labuan	Expansion of existing facilities (BPAM) 1,200 households - 2,200 households in the year of 2000 (Water source will be the spring)
3. IKK Cibaliung	New Development (BPAM): 2.5 lit/sec from Cibaliung river (118 Households)
4. IKK Cikeusih	New Development (BPAM): 2.5 lit/sec from Cikondang river (171 Households)

Source: PDAM



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	Fig. I(B)-16 MAJOR WATER SOURCE DEVELOPMENT PLAN

3.3 Prospective Water Sources for Tourism Development

The water demand for tourism development is smaller than for other sectors. The following supply services can be envisaged:

1) The vicinity of Serang city or Pandeglang city

Spring or groundwater development should be exploited. Water from the new water supply system being developed by PDAM or BPAM could be also expected.

2) The vicinity of Anyer, Merak city

Water supply from the water source of the Cilegon Industrial Estate is expected.

3) The vicinity of Labuan city

The following rivers can be anticipated as water sources.

Cidangur river : The existing water supply facility from BPAM is available in the middle of the city. 20 lit/sec can be expected for the new development.

Cisata river : 1.3 m³/sec can be expected for new domestic use according to the Directorate General of Irrigation.

Cilemer river : 3.3 m³/sec can be expected for new domestic use.

4) Southern part of Labuan

1.7 m³/sec can be expected for new domestic use from Ciseukeut river.

5) Others (Krakatau, Ujung Kulon, etc.)

Boreholes should be exploited for a very limited quantities from pitched water tables.

CHAPTER 4 ELECTRICITY

4.1 Organization

Electricity in the Republic of Indonesia is supplied by the PLN (Public Corporation of Electricity), which has responsibility for all phases of electricity supply activities covering generation, transmission, distribution and consumer services.

PLN has the following regional management system by Wilayah in Java.

- West Java Wilayah : No. XIV, Jakarta headquarters
- Central Java Wilayah : No. XIII, Sewarang headquarters
- East Java Wilayah : No. XII, Sulabaya headquarters

4.2 Existing Electrical Facilities

PLN supplies electricity to DKI Jakarta and the regional capital of Bandung from both hydropower and thermal power stations.

The principal power plants in West Java are the following:

- Cirata PLTA (Hydro power, 500 MW)
- Saguling PLTA (Hydro power, 700 MW)
- Suralaya PLTU (Thermal power, 3,100 MW in final output)

Suralaya PLTU located in the northern part of the promontory in Kab. Serang has been generating 800 MW with two sets of thermal generators consuming up to 170 tons of coal an hour since the end of 1985. The final output of Suralaya PLTU is expected to be 3,100 MW.

In addition to Suralaya PLTU, PT. Kratatau steel power plant generates 150 MW in Cilegon Industrial Estate and small scale

thermal generators for the rural area are being operated by PLN in the study region.

From Suralaya PLTU, an extra high voltage transmission line of 500 KV is connected directly to Gandul substation in the suburbs of Jakarta and to Kosambi substation in the centre of Jakarta via the Serang substation in order to supply of electricity to the capital.

Fig. I(B)-17 shows existing electrical facilities in the study region. Electricity, generated in Suralaya PLTU, is transmitted to the substations of Serang and Pandeglang and is transformed to a medium voltage of 20 kV or 6 kV. The medium voltage supplies are distributed within a radius of 40 km from these substations.

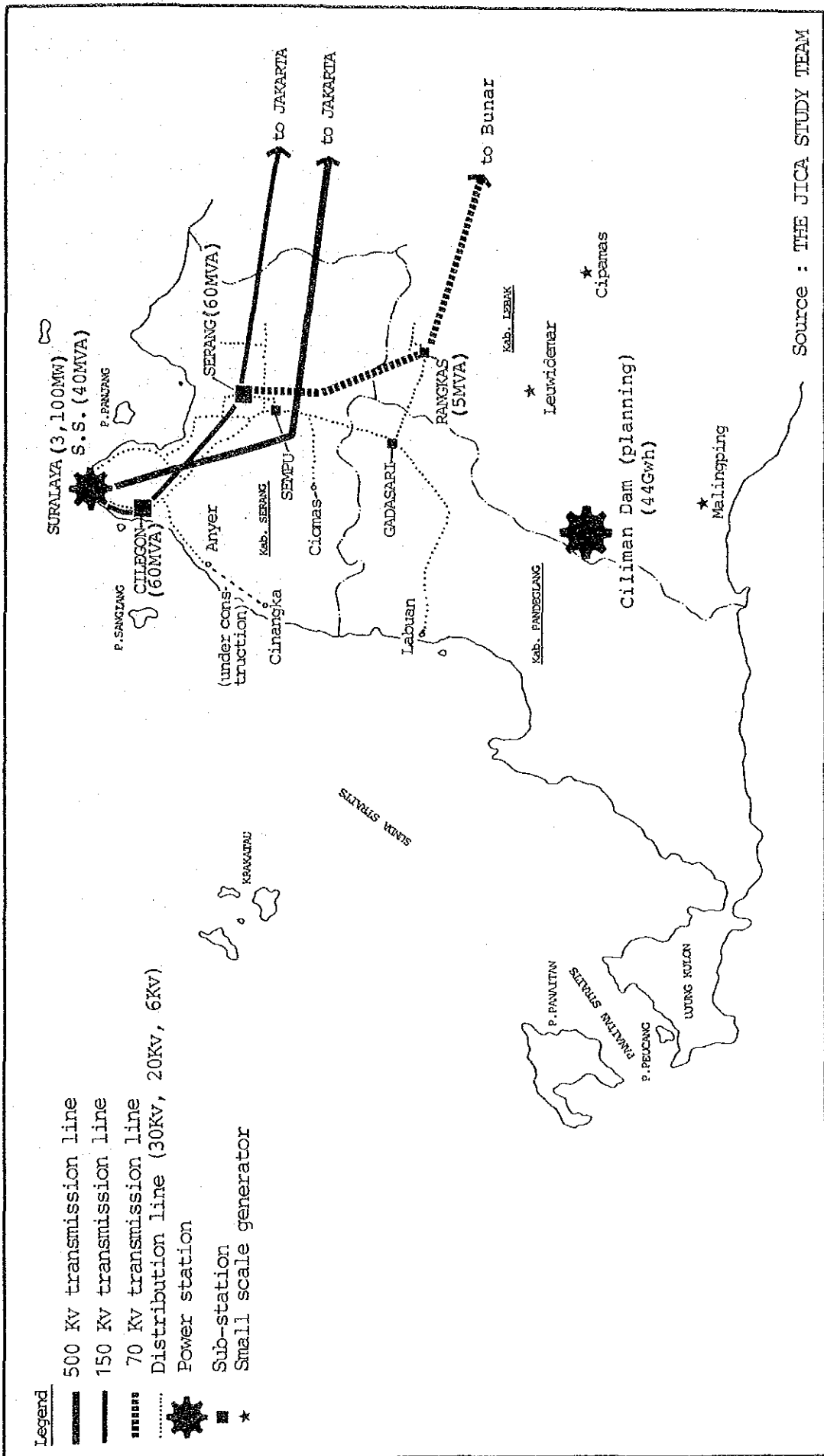
Labuan and Anyer cities receive electricity from Suralaya PLTU, but Carita is outside the radius of supply.

Table I(B)-38 shows the number of customers and electricity consumption from PLN. 20,158 customers in Serang and 5,066 in Pandeglang account for only 7.9% and 3.1% respectively of the total households. The number of households using the electricity for lighting is still very small in the study region as shown in Table I(B)-39.

4.3 Future Plan

PLN is planning to expand the capacity of the existing power stations, transmission lines and substations. Suralaya, Saguling and Cirata power station may be enlarged in the near future.

In the study region, there is a medium voltage transmission line construction project from Anyer to Cinangka [see Fig. I(B)-17] which is expected to be realized very soon.



Source : THE JICA STUDY TEAM


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Fig. I (B)-17
PRESENT CONDITION OF THE ELECTRIC FACILITIES

Table I(B)-38 NUMBER OF CUSTOMERS, ELECTRICITY CONSUMPTION SERVED BY PLN IN 1984/85

Kab.	No. of Customer	MWh	No. of Households	Ratio of diffusion (%)	MWh per Customer
Serang	20,518	45,683	260,604	7.9%	2.23
Pandeglang	5,066	4,411	162,062	3.1	0.87
Study region	25,584	50,094	422,666	6.1	1.96
West Java	918,460	1,809,334	6,570,519	14.0	1.97

Source: Data dan Statistik, 1984/85, PLN

Table I(B)-39 TYPE OF FUEL FOR LIGHTING BY HOUSEHOLD IN 1980

(Unit: %)

	Electricity	Pressure lamp	Kerosene	Others	Total
Kab. Serang	9.1	10.1	79.1	1.7	100.0
Kab. Pandeglang	3.3	6.2	89.7	0.8	100.0
West Java	13.9	12.0	72.9	1.2	100.0

Source: Penduduk Jawa Barat - Hasil Sensus Penduduk 1980 (Biro Pusat Statistik)

CHAPTER 5 OTHER INFRASTRUCTURES

5.1 Solid Waste

Public services for solid waste disposal are only provided in Serang and Pandeglang cities. The Cilegon Industrial Estate has its own disposal system.

DPUK (Regional Public Works Service), the solid waste disposal authority in Serang collects 60 m³ of solid waste per day and disposes of this at a tip on the outskirts of the city, using six garbage trucks with a capacity of 4 m³ per each. 20% of the total garbage in Serang city is disposed of by DPUK.

DPUK handles also solid waste disposal in Pandeglang city. Four garbage trucks with the capacity of 4 m³ each collect every day approximately 10 m³ out of a total of 100 m³ solid waste generated in the city. The tip for the solid waste disposal is located in a field 7 km south-east from Pandeglang city.

Based on the accommodation survey conducted by JICA Study Team, Anyer Beach Hotel and Krakatau Beach Hotel have their own solid disposal tips adjacent to their sites.

5.2 Waste Water Treatment

There are no waste water treatment facilities even in the urban areas of the study region.

Septic tanks provide the only treatment, however the service ratio of septic tanks is no more than a few percent in West Java as shown in Table I(B)-40.

Even at first class hotels in Jakarta, waste water is treated by septic tanks.

Table I(B)-40 PRESENT CONDITION OF WASTE WATER TREATMENT

Kab.	Private toilets with septic tank	Private toilets without septic tank	Shared toilets & others	Total
Serang	14,352 (6.2%)	5,437 (2.4%)	211,233 (91.4%)	231,022 (100%)
Pandeglang	4,308 (3.0%)	3,820 (2.7%)	135,989 (94.3%)	104,117 (100%)
West Jawa	411,105 (6.7%)	443,162 (7.3%)	5,246,446 (86.0%)	6,100,713 (100%)

Source: Penduduk Jawa Barat - Hasil Sensus Penduduk 1980,
Biro Pusat Statistik

ANNEX I (C)

REGIONAL DEVELOPMENT

ANNEX I (C)
REGIONAL DEVELOPMENT

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CHAPTER 1 . DIAGNOSIS OF DEVELOPMENT POTENTIALS

1.1 Characteristics of the Study Region

Based on the synthetical analysis of the data collected and results of interview survey, general socio-cultural and economic conditions of the region were clarified and its main characteristics were put into relief, as summarised as follows:

1.1.1 Natural conditions

Natural conditions of the region are good by and large and there is no major natural constraints for the regional development except for some damages caused by eventual floods and blasts of wind in limited areas. As one of the key features determining socio-economic conditions of the study region, there is a fact that the region possesses a tremendous diversity in terms of natural conditions:

- 1) location surrounded with Java Sea, Sunda Straits and Indian Ocean;
- 2) land and landscape resulting into various land use such as forests, natural reserve areas, cultivated field, plantation, swamp, etc.; and
- 3) climatic conditions varying according to its location and topography.

As to the natural resources in the study region comprising arable land, water, forest, fishery, etc., their potentials are confirmed to be relatively large, except for minerals.

As to the utilization of land areas, most of arable lands are already fully exploited, except in the areas where exist serious water shortage problems.

1.1.2 Human resources

The population in the study region is unevenly distributed due to its natural conditions [Refer to Table I(A)-9]. It is dense in the northwestern part and scarce in the southwestern area. The West Java Province is one of the biggest producers of migrants among others in Java Island. Nevertheless, the net migration rate of West Java Province indicates +0.03% [Refer to I(A)-11]. This migratory plus means that the Province is contrarily receiving migrants from neighboring provinces and the outer islands.

Due to inter-provincial migration, rural-urban migration has been accelerating also in the region. As indicated in REPELITA IV, the regional economy is facing many labor problems, i.e. unskilled and unfavourable manpower and under-employment. Because of the existing majority of under 20 years of age in the population, further expansion of labour-incentive industrial sector and educational approach to the labour force are urgently required.

1.1.3 Social infrastructures

According to the statistics, the level of social structures and services in the West Java Province, such as road, water supply, electricity, education facilities, etc. is, as a whole, higher than that of other provinces of the country. This is mainly due to its location surrounding the metropolis Jakarta.

However, most of social infrastructures and basic social services of the region are concentrated in the urban areas of the northern part (especially, Serang, Pandeglang and Merak) with high disparities to the rural areas, resulting in a flowout of the rural population [Refer to Tables I(A)-20 and I(A)-21].

Consequently, from the point of view of urban-rural equity, considerable stress on future development and investment shall be put on the rural areas to compensate the existing great gaps.

1.1.4 Production sectors

1) Agriculture

Agriculture is the mainstay of the region. The key feature of the region in this sector resides in its farm size and relatively low productivity. The distribution of farm household by farm size and unit yield of the main agricultural products are shown in the following tables.

Table I(C)-1 LAND HOLDING AND FARM HOUSEHOLD, 1983

Farm size (ha)	Study region		Average West Java (%)
	Kab. Serang (%)	Kab. Pandeglang (%)	
> 0.05	6.5	3.8	9.2
0.05 - 0.09	4.4	4.1	10.1
0.10 - 0.24	15.0	11.5	23.7
0.25 - 0.49	26.2	20.7	22.7
0.50 - 0.74	17.6	17.7	13.0
0.75 - 0.99	8.1	9.8	6.0
1.00 - 1.99	15.4	20.7	10.5
2.00 - 2.99	3.9	7.1	2.9
> 3.00	2.9	4.6	1.8
	100.0	100.0	100.0

Source: Kantor Statistik Provinsi, Jawa Barat.

Table I(C)-2 UNIT YIELD OF THE MAIN AGRICULTURAL PRODUCTS IN 1983

Kabupaten	Paddy		Soy beans	Maize	Cas-sava	Sweet Potato	Ground-nuts
	Irri-gated	Rain-fed					
Serang	4.3	2.7	0.8	1.3	12.8	8.8	0.9
Pandeglang	4.1	1.8	0.7	1.1	11.1	7.9	1.0
West Java	4.4	2.1	0.9	1.7	11.0	8.5	1.2

Source: Dinas Pertanian Provinsi, Jawa Barat

The above tables reveal a prominent contrast between conditions of Kabupatens, i.e. regional disparity. In Kab. Serang, agricultural land has already been intensively cultivated and its productivity is around the average of West Java. To the contrary, Kab. Pandeglang remains one of less developed Kabupatens in this sector in spite of its rather larger farm size per household compared with those of other Kabupatens. Because of land conditions, the majority of farmers are engaged in traditional agriculture, cultivating mostly rain-fed paddy, sweet potatoes, fruits, plantation crops such as coconuts, coffee, etc. [Refer to Tables I(A)-22 ~ 28]. Coconuts and coffee are dominant cash crops, and other cash crops include vegetables, rubber and clove.

2) Forestry

Of the 4,520 km², total area the study region, forests cover about 928.4 km² (20.6%). Most of the forests in the region belong to the national park (Ujung Kulon) and are designed as natural reserve areas. The exploitation of forestry resources should be made taking into

consideration natural conservation which is considered to be imperative.

Nevertheless, the importance of forest exploitation can not be denied in connection with agro-industry, agro-forestry as well as fuel resources.

3) Livestock

Because of natural conditions, big livestock production such as cattle breeding including milking cow and horse is lagging behind in the study region. However, small livestock such as goat, sheep and poultry breeding is actively realized [Refer to Table I(A)-32].

As for the number of water buffaloes in the study region, it is relatively large compared with that in other Kabupatens of the West Java Province. This seems to be related to the land use and its size (relatively large in Java Island) and land holding of farmers in the region, because a correlation is generally observed between the number of water buffaloes and planted area of wet season paddy in Indonesia.

4) Fishery

Owing to a long coastline, sea fishery production in the study region (especially Kab. Pandeglang) is very active compared with that of other Kabupatens of the Province [Refer to Table I(A)-35].

As to inland fishery in the study region, fishery in swamps and ponds is being encouraged, but it is not significant yet. The shares of sea and inland fisheries in the region are estimated to be respectively about 18% and 1% of the Provincial total. Besides, both, sea and inland fisheries in the region are undertaken in small scale using primitive techniques.

5) Manufacturing

In the northwestern coastal zone of the study region, especially in the Cilegon Industrial Estate, there exist several major manufacturing establishments such as PT. Krakatau Steel Works (Cilegon), Pt. Satya Raya Indah Wood-based Industries (Anyer), Pertamina Petrochemical and PT. Statomer PVC Resin (Merak).

Many other small scale manufacturing industries including brick, tile, sawmill, food processing, bamboo and wood handicraft are scattered in various locations of the northern part of the region [Refer to Table I(A)-38].

The manufacturing sector in the southwestern part of the region is minor and is mostly dominated by agro-industries, including coffee and coconut processing factories.

1.2 Constraints to Regional Development

a variety of factors are interacting one another through a complicated mesh of cause-effect relationships. The problem structure analysis is a method to examine in a macroscopic way more important factors and interactions among them in order to clarify basic development problems and constraints facing the study region.

Comprehensively, the present problems and constraints for the regional development are pointed out as summarised hereunder:

1) Overall perception

As compared with other regions of the country, the study region does not seem to have critical constraints to regional development other than common constraints that most regions share.

2) Regional disparities

Based on the analysis of data collected, remarkable disparities can be observed between the northern and southern halves of the study region. As a result of rural-urban and inter-provincial migration, major socio-economic activities of the region are concentrated in the northern half. Development of the region so far has been centering in northwestern coastal zone and the main towns along the principal roads. This has resulted in over-utilization of health and educational facilities as well as water supply facilities.

On the other hand, the southwestern part of the region is handicapped by the fact that it is peripherally located in Java Islands. But it is noticed that the south western and central mountainous areas of the region including Ujung Kulon National Park (51,000 ha) are reserved as protected natural conservation areas.

3) Land use and land holding

As mentioned above 1.1.4 1), major parts of the land in the region is owned by small holders. The land is one of the limiting key factors for future development.

4) Spatial constraint

From a spatial viewpoint, land to be exploited is limited to the wild land consisting of forests and swamps. For acquisition of developed land, time-consuming process and colossal funds are needed.

5) Financial problems

As to the regional potentials in natural resources including water, electricity, etc., there seems to be no problem. But a huge investment is required for their

development, i.e. construction of dams & reservoirs, irrigation facilities, factories, etc. and reclamation of swamp areas through flood control, drainage and so on.

6) Improvement of infrastructure and environment

Except for the main roads in the northern part of the study region, the conditions of the roads are extremely poor in the southern part of the region. Together with the improvement of the said main roads, the construction and/or improvement of rural roads should be carried out from the viewpoint of regional development aiming at reducing the disparities between urban and rural areas. However, it is quite important to pay much attention to the environmental impacts subsequent to the development of the infrastructure.

Other basic facilities such as power, water, communication, sewerage, etc. should also be improved to alleviate regional disparities.

7) Storage and marketing

For the primary products, especially agricultural and fishery products, storage and processing facilities shall be developed in a long range program in relation with the development of each industry.

8) Technological level

The technological level may pose another serious constraints especially to modern, improved and intensive industries development comprising agriculture, livestock, fishery and manufacturing.

9) Tourism assets and their supporting system

Tourism is a potentially an important sector with the existence of many kinds of parks, beaches, historical relics, etc., but it is now hampered by lack of adequate infrastructure such as access roads, accommodations and so on. As result of accelerated urbanization, in the last decade, needs for recreation and tourism are increasing at a high speed, but the growth tempo per capita income of the people does not allow a rapid development of tourism.

1.3 Future Prospects

Development potentials of the study region seem fairly high, given resources of various kinds. However, the existence of high and various potentials does not by itself guarantee the region's development. Development effort should be concentrated on several most promising areas (development centres) rather than spread out thinly over all the different areas.

Undoubtedly, with its geo-economic importance, the northern part of the region will continue to play major role in the regional development. As it develops further, it would necessarily equip itself with more productive and service activities, which may include not only commercial and trade activities but also public service functions.

On the contrary, in the southern part of the region, there is much to be exploited. Crop diversification and increase of its productivity are an absolute "must" for the further regional development. Also livestock development, together with fishery, would contribute to improving the living standard of local people as well as to the regional development. As a prerequisite for this, the storage and marketing problems have to be solved, particularly with establishment of storage and processing facilities in each

development center and improvement of rural access roads to collect products.

For further development of the region, it will be necessary to process products of primary production sector within the region. Improvement of transportation infrastructure and rural electrification are prerequisites for such development.

Tourism is an important sector as an engine for the regional development, and there are many tourist assets in the region, both established and potential/proposed. Tourism development in the region is basically capitalizing on good natural potentials and historical assets as shown in Table I(C)-3.

Table I(C)-3 ESTABLISHED TOURIST ASSETS IN THE STUDY REGION

	Number of Tourism Assets (%)			
	Kab. Serang	Kab. Pandeglang	Study Regional	West Java
Beach	10 (32.3)	1 (3.2)	11 (35.5)	31
Lake	1 (7.1)	-	1 (7.1)	14
Dam	2 (15.4)	-	2 (15.4)	13
Cave	2 (15.4)	-	2 (15.4)	13
Tourist park	4 (21.1)	-	4 (21.1)	19
National park & Natural Reserves	1 (16.7)	3 (50.0)	4 (67.7)	6
Sea park	-	1 (11.1)	1 (11.1)	9
Historical relics	16 (27.1)	5 (8.5)	21 (35.6)	59
Museum	2 (25.0)	-	2 (25.0)	8
Recreation park	6 (14.3)	-	6 (14.3)	42
Camping area	4 (50.0)	-	4 (50.0)	8
Others	11 (13.9)	3 (3.8)	3 (17.7)	79
Total	59 (19.6)	13 (4.3)	72 (23.9)	301

Source: Fasilitas Obyek Wisata di Indonesia, 1984,
Biro Pusat Statistik

CHAPTER 2 FRAMEWORK FOR REGIONAL DEVELOPMENT

2.1 Development Objectives and Strategies

In accordance with the national development policy, the Provincial Government sets forth the long-term objectives to provide guidelines for the formulation of development policies and strategies. They include sustained economic growth and equitable development as well as other objectives related to socio-cultural aspects and basic human needs.

Development objectives for the West Java Province as set out in the Regional Repelita IV (4th Five Year Development Plan: 1984 - 1988) are summarized as follows:

First: To level up the living standard, education and social welfare by realizing the following:

- Increase of per capita income,
- Harmonious development between agriculture and industry,
- Encouragement of other export commodities than oil and gas,
- Improvement of marketing system,
- Consolidation of economic structure, especially through the establishment of cooperatives,
- Amplification of private investments,
- Consolidation of loan system in rural areas,
- Promotion of rural economy,
- Creation of job opportunities,
- Improvement of labour skill,
- Establishment of social security for employees,
- Improvement of educational quality,

- Stability of people's good mentality and increase of faith and loyalty to God,
- Integration of regional cultures into the development,
- Improvement of people's health and environmental quality.

Second: To establish a solid foundation for the next development stage by realizing the following:

- Decrease of population growth rate,
- Balanced population distribution, both in inter-regional and urban-rural aspects,
- Institutional arrangements for land use and land ownership,
- Practical exploitation of natural resources such as land, water, forest, etc.,
- Consolidation of transportation system,
- Development of tourist attraction in West Java, as one of the main national tourist destinations,
- Improvement of living environment both in urban and rural areas by installing suitable facilities and utilities,
- Regionalization of administrative divisions in accordance with the needs,
- Reinforcement of regional government officers in number and leveling up of their ability,
- Diversification of regional income sources (exploitation of original financial source),
- Practical use of human resources through training.

2.2 Conceptual Spatial Framework

2.2.1 Existing studies and expected projects

As one of the most important schemes which seem to concern the study on the regional development project focusing on tourism in the western part of West Java, there exists a study on the west-coast development in the Banten Area which includes 5 Kecamatans from north to south, Anyer, Cinangka, Labuan, Pagelaran and Cigeulis.

The study reports on development of the aforesaid coastal areas are:

- The Research on the Management System of the West-Coast Area in West Java, Office of the Minister of State for Population and Environment, 1984;
- The Lay-out Plan of Banten West Coast Area, West Java Province Bappeda, 1986.

In addition to the above, the major studies conducted and projects expected to be implemented in the study region are listed below.

- Jakarta-Merak Highway Project (Department of Communication),
- West-Java Regional Development Planning (General Assessment of Development Potentials, Problems and Constraints of the Province of West Java, 1986),
- Bakauhuni-Merak Ferry Terminals Projects (Department of Communication),
- Ciwandan Public Port Project (Department of Communication),
- Road Betterment Project for Cilegon-Labuan and Saketi-Malingping (Department of Public Works),

- Study on the Direct Linkage between Sumatra and Jawa (Department of Research and Technology),
- Study on the Railway Development for Cigading-Citayam (Department of Communication),
- Master Plan Study on North Banten Water Resources Development (Department of Public Works),
- Others
[Refer to Table I(C)-4].

A project in a region may be inter-related to other projects in the same region both physically and economically. In evaluating and selecting the priority projects, it would be therefore indispensable to take account of the progress of each study and project and coordinate, if necessary, in order to ensure a balanced and harmonious regional development.

2.2.2 Region's position in spatial development

In light of national policies for spatial development to ensure the regional balance in the country's socio-economic performance, and the strategic location of the Region, the following seem to be particularly important as the Region's position:

- 1) Satellite development center of the Megalopolis Jakarta (as supplier of industrial, agricultural and fishery products, etc.)
- 2) Nodal point in the corridor of economic development connecting Java (Jakarta) and South Sumatra.

The above both functions are being consolidated with a series of projects undertaken by the Government to promote the regional development, especially through the construction of the Jakarta-Merak Highway.

Table I(C)-4 LIST OF THE MAJOR ONGOING PROJECTS (1985/86 - 1986/87) IN THE STUDY REGION

No.	Names of Studies and Projects	Location (Kebupaten)	Year	Fund	
				Amount (x Rp.1,000)	Source
1.	Labuan city and its surrounding development project	Pandeglang	1984-1986	40,000	APBD ¹ I
2.	West Banten beach area development project	Serang, Pandeglang	1985-1987	45,000	APBD I
3.	Pandeglang city plan	Pandeglang	1986-1987	30,000	APBD I
4.	Serang city plan	Serang	1985-1986		APBN ²
5.	Merak city plan	Serang	1986-1987		APBN
6.	West Java tourism development study	Serang, Pandeglang	1986	70,263.5	APBN
7.	Cilegon city development study	Serang		20,000	APBD I
8.	North-west beach development plan in Banten area	Serang	1985-1986		APBD I
9.	Study on land use assessment of the Banten western beach	Serang, Pandeglang	1986-1987	15,000	APBD I

No.	Names of Studies and Projects	Location (Kebupaten)	Year	Fund	
				Amount (x Rp.1,000)	Source
10.	Cilegon city plan	Serang	1985-1986		APBD I
11.	Das Ciujung-Teluk Lada development (aforestation) plan	Serang, Pandeglang	1985-1986	54,000	APBD I
12.	Road and bridge improvement project (including, Wil. Bina Marga bridge & Cipta Karya Banten bridge)	Serang, Pandeglang, Lebak	1985-1986	185,000	APBD I
13.	West Java road improvement project (UPCA)	Pandeglang	1985-1986		APBN
14.	West Java road improvement project	Pandeglang, Serang	1986-1987		APBN
15.	Railway construction project	Serang	1985-1986	3,413,463	APBN
16.	Merak-Bakauhuni transportation improvement project	Serang	1985-1986	94,670	APBN
17.	Regional development project	Serang, Pandeglang	1985-1986		APBN (Multi-years)

No.	Names of Studies and Projects	Location (Kebupaten)	Year	Fund	
				Amount (x Rp.1,000)	Source
18.	Inpres ³ DT.II (per-capita)	Serang	1985-1986 1986-1987	1,429,153 1,681,357	APBN/Inpres - idem -
19.	Inpres ³ DT.II (per-capita)	Pandeglang Pandeglang	1985-1986 1986-1987	869,140 1,002,518	- idem - - idem -
20.	Inpres ³ (for roads)	Serang	1985-1986	70,000	APBN/ Inpres APBD
	Inpres ³ (for roads)	Pandeglang	1986-1987	849,000	- idem -
21.	Teluk Lada irrigation project	Pandeglang			APBN (Multi-years)
22.	Cigading port improvement project	Pandeglang			APBN
23.	Jakarta-Tangerang-Merak road improvement project	Tangerang, Serang	1985-1986		
24.	Old Banten city rehabilitation project	Serang	1981-1987	45,824	APBN 86/87
25.	Ujung Kulon National Park preservation project	Predeglang	1985-1986	89,000	APBN

No.	Names of Studies and Projects	Location (Kebupaten)	Year	Fund	
				Amount (x Rp.1,000)	Source
26.	Research and development of natural resources (mineral, water and land)	Pandeglang (taman jaya)	1985-1986	185,000	APBD I

Remarks: /1 Regional budget
/2 National budget
/3 Presidential Instruction

Source: Extraction from the budget Register for Fiscal Year of 1985/86 - 1986/87, Provincial BAPPEDA.