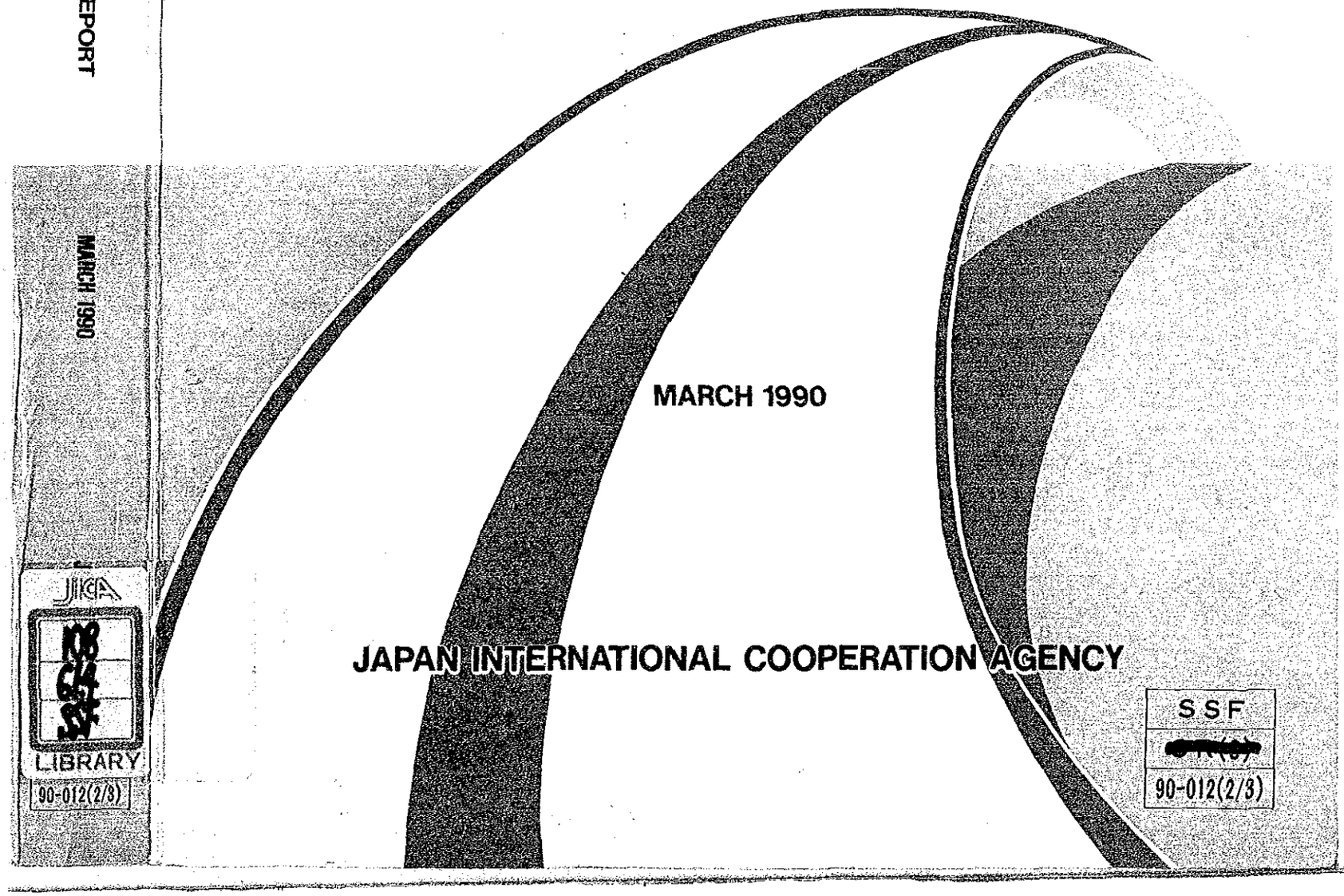
社会開発調査部報告書

THE REPUBLIC OF INDONESIA
DIRECTORATE GENERAL OF HIGHWAYS
MINISTRY OF PUBLIC WORKS

FEASIBILITY STUDY ON THE CIKAMPEK-CIREBON TOLLWAY PROJECT

FINAL REPORT



MARCH 1990

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to a request from the Government of the Republic of Indonesia, the Japanese Government decided to conduct a feasibility study on Cikampek-Cirebon Tollway Project and entrusted the study to Japan International Cooperation Agency (JICA).

JICA sent to Indonesia a survey team headed by Mr. Keikichi Yoshida, and composed of members from Pacific Consultants International, Yachiyo Engineering Co., Ltd. and Pasco International Inc. four times from September 1988 to December 1989.

The team held discussions with concerned officials of the Government of Indonesia, and conducted field surveys. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

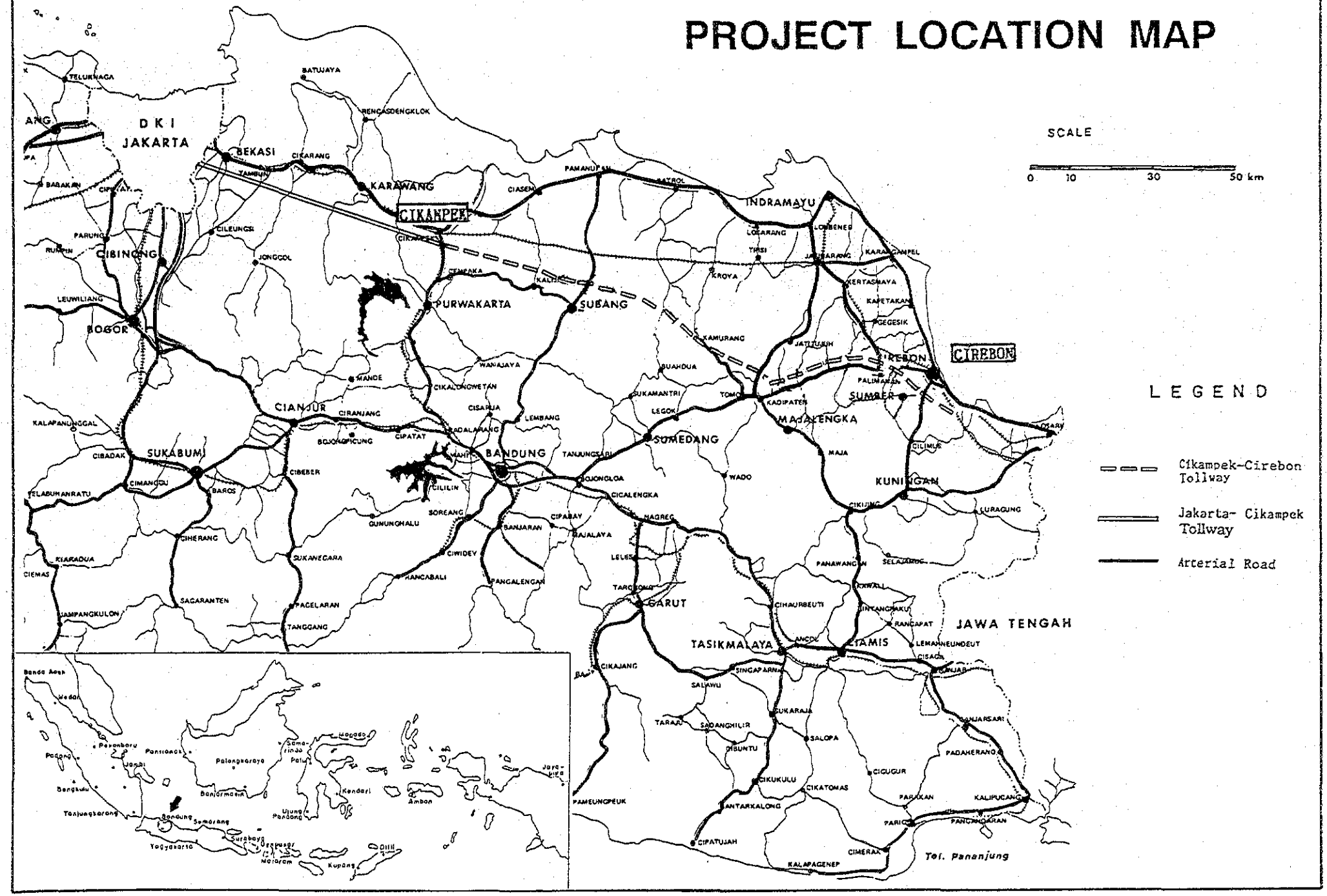
I wish to express my sincere appreciation to the officials concerned of the Government of Indonesia for their close cooperation extended to the team.

March, 1990

Kensuke Yanagiya

Kensuke Yanagiya
President
Japan International Cooperation Agency

PROJECT LOCATION MAP



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CHAPTER 1. INTRODUCTION

CHAPTER 1. INTRODUCTION

1.1 Study Background

Indonesia comprises more than 13,500 islands covering a land area of about 1,920,000 square kilometers with a population of around 164 million inhabitants.

Java covers about 132,000 square kilometers and comprises only 7 percent of the whole Indonesian territories. The population of Java is around 100 million which is about 60 percent of the total Indonesian population. The island is the most densely populated area in Indonesia with metropolitan type cities namely DKI Jakarta, Surabaya, Bandung and Semarang.

DKI Jakarta is the capital city of Indonesia and Cirebon is a coastal city to the east and an important port in the Province of West Java. It is defined as a Primary Function City and Regional Development Center of West Java. Both cities have been developed in economic activities especially in the field of trade and industry and therefore have a rapidly growing demand for improved transport links.

The traffic volume between DKI Jakarta and Cirebon City has doubled in the past five years, causing frequent traffic congestion on many parts of the existing roads due to insufficient capacity. In recognition of this demand, the construction of a new expressway between DKI Jakarta and Cirebon city was considered by the Directorate General of Highway, Ministry of Public Works (hereinafter referred to as Bina Marga) as a portion of the Trans Java Highway Network. Construction of part of the Jakarta - Cirebon Expressway, the section between Jakarta and Cikampek, began in 1984 and was completed in September 1988.

As the next stage of implementation of the Jakarta - Cirebon Expressway, Bina Marga has decided to carry out a feasibility study for the implementation programme of the Cikampek - Cirebon section.

Due to a shortage of public funds for highway development, the West Java Tollway System was established more than a decade ago. The Jakarta - Cirebon expressway constitutes a part of this system and this project is intended to be designed as a tollway between Cikampek and Cirebon.

Upon the background mentioned above, the Government of the Republic of Indonesia requested a feasibility study on the Cikampek - Cirebon tollway project to the Government of Japan, which accepted it and entrusted the study to Japan International Cooperation Agency (JICA).

In March 1988, JICA dispatched a Preliminary Study Team headed by Mr. Yukihiko Sumiyoshi to Indonesia for a reconnaissance study as well as for discussion on the scope of work for the forthcoming study. The scope of work agreement was concluded on March 24, 1988 between Bina Marga and the JICA Preliminary Study Team.

This present Report was prepared in accordance with the above scope of work.

1.2 Study Objective

1.2.1 Objective of the Study

The objective of the study is to determine the feasibility of constructing a tollway between Cikampek and Cirebon as a part of the Trans Java Tollway network to encourage inter-city transport between DKI Jakarta and Cirebon City in West Java Province.

1.2.2 Study Area

The study area covers the route area between Cikampek and Cirebon and the surrounding area which is both directly and indirectly influenced by tollway construction.

1.2.3 Scope of the Study

In order to achieve the study objective mentioned previously, the Study consists of two (2) phases with the following major study objectives.

Phase I : A major objective of this study phase is to select an optimal route for the Cikampek - Cirebon Tollway, based on traffic projections and preliminary economic and financial analysis for the comparison of various alternative routes.

Phase II : The selected optimal route is further studied from more detailed field surveys, preliminary engineering and final economic and financial analysis to identify the feasibility of the proposed tollway project.

The work schedule and the flow of the Study is shown in Figs. 1.2.1 and 1.2.2.

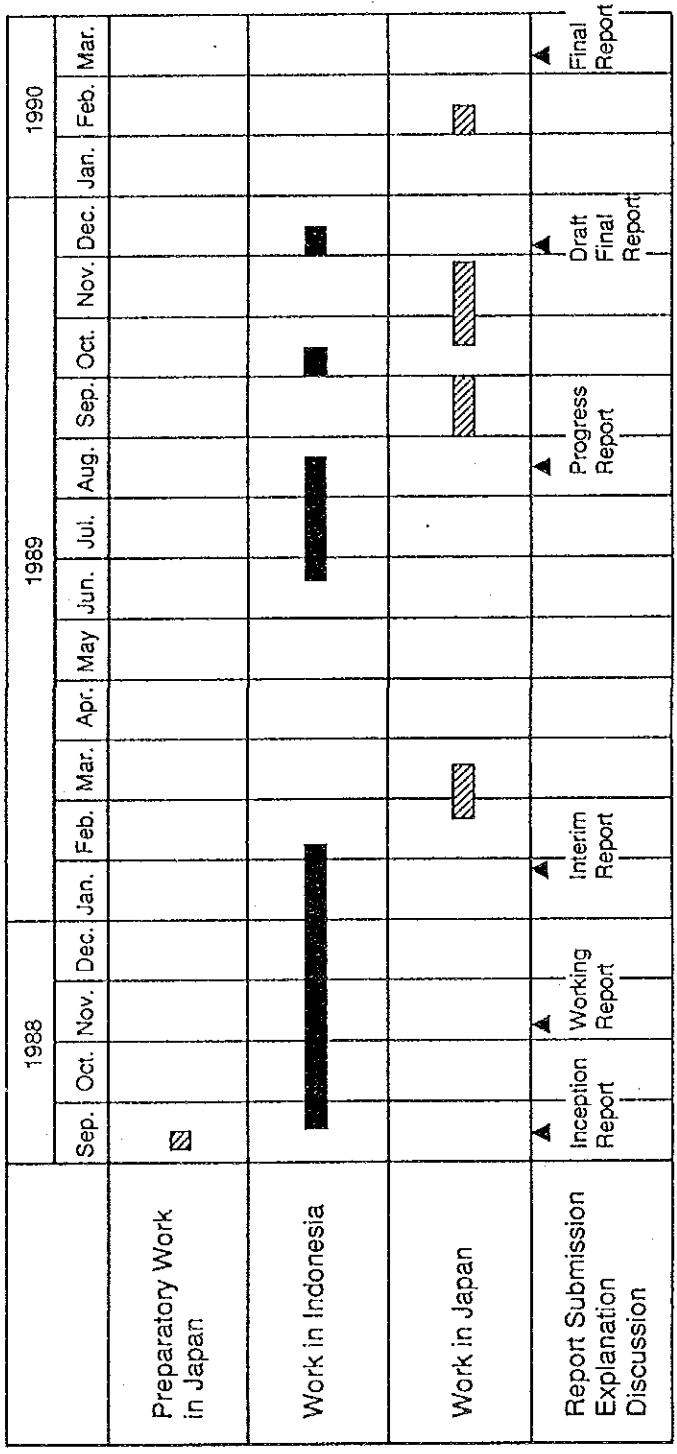


Fig. 1.2.1 Work Schedule

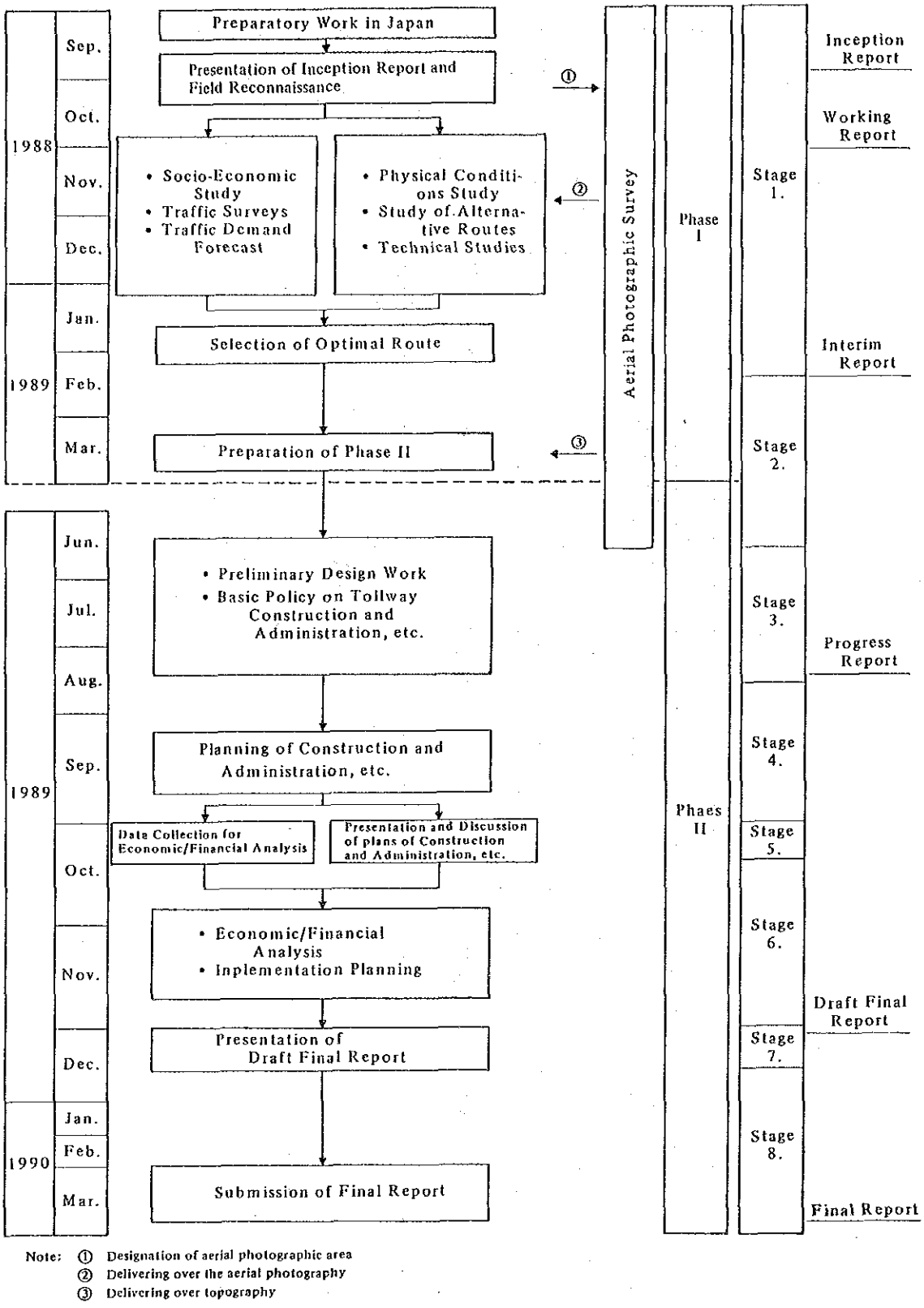


Fig. 1.2.2 Flow of the Study

1.2.4 Study Organization

The study organization chart is shown in Fig. 1.2.3.

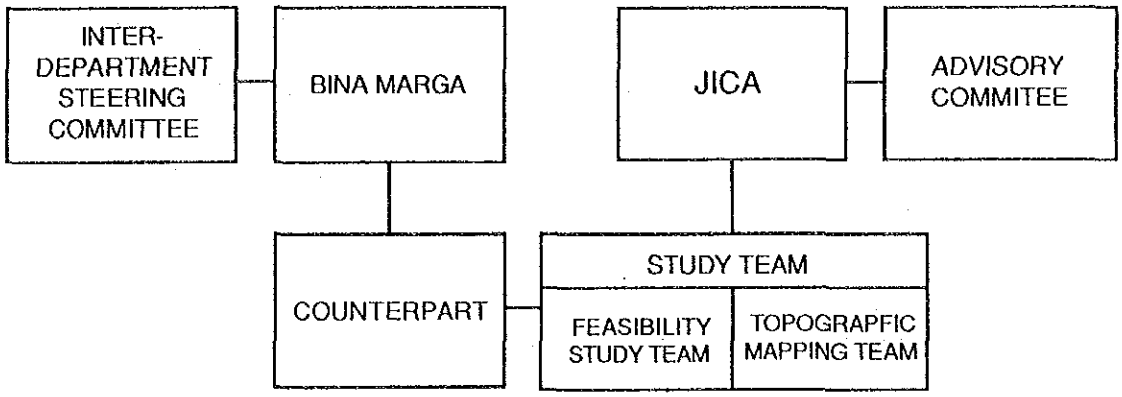


Fig. 1.2.3 Organization Chart

The Indonesian Steering Committee, counterparts, JICA Advisory Committee, and the Study Team are as follows:

1) Indonesian Steering Committee

Name	Name of Organization
Mr. Solechan	Director of Urban Road Development, Bina Marga
Mr. Djoko Asmoro	Director of Urban Road Development, Bina Marga (Successor of Mr. Solechan)
Mr. Wiyoto Wiyono	President Director, Jasa Marga (Indonesian Highway Corporation)
Mr. Soehartono	President Director, Jasa Marga (Successor of Mr. Wiyoto Wiyono)
Mr. Arifin Yusuf	Chairman of West Java BAPPEDA, Provincial Government of West Java

(Technical Committee Members):

Mr. Sukasdi	Bina Marga
Mr. Soehartono	Bina Marga
Mr. Anas Aly	Bina Marga
Mr. Sukawan M.	Bina Marga
Mr. Suardi W.	Bureau of Public Works, Provincial Government of West Java
Mr. Amar	BAPPEDA, Provincial Government of West Java
Mr. Parmin	Jasa Marga
Mr. Subandi	Jasa Marga
Mr. Budisantoso	Jasa Marga

2) Indonesian Counterparts

Name	Assignment	Name of Organization
Mr. Bambang Djoko Pitojo	Project Officer	Bina Marga
Mr. Wahyono Munardi	Survey	Bina Marga
Mr. Hasanudin	Planning	Jasa Marga

3) JICA Study Team

(Feasibility Study Team)

Name	Assignment
Keikichi Yoshida	Team Leader
Isamu Gunji	Transport Planning and Economic Analysis
Yoshinobu Nomura	Transport and Regional Planning
Tsutomu Kudo	Traffic Survey and Analysis
Tsuyoshi Ito	Traffic Survey and Analysis
Shoji Miyazaki	Road Planning, Maintenance Planning, and Environmental Analysis

Kazuo Mizukoshi	Road Planning and Engineering
Teruo Tatsuzaki	Structural and Hydrological Planning
Masatoshi Kaneko	Tollway Planning and Financial Analysis
Kooichi Ichikawa	Construction Planning and Cost Estimation
Katsutoshi Suzuki	Geotechnical and Geological Survey

(Topographic Mapping Team)

Masaru Toshioka	Team Leader
Kuniaki Takamatsu	Deputy Team Leader (Supervisor of Aerial Signalization/GPS Observation)
Kiyoto Hayakawa	Supervision of Aerial Photography
Yutaka Kokufu	Supervision of Aerial Triangulation/Machine Plotting
Daikichi Nakajima	Supervision of Machine Plotting
Yutaka Nakada	Supervision of Compilation/Supplementary Survey
Atsuo Yoneoka	Supervision of Cartography
Yuji Katsumata	Supervision of Cartography

4) JICA Advisory Committee

Name	Name of Organization
Kunihiko Takada Chairman	Head of Road Research Division, Road Department, Public Works Research Institute, Ministry of Construction
Yoshitaka Kishimoto Member	Deputy Director, Toll Road Division, Road Bureau, Ministry of Construction
Takashi Suzuki Member	Toll Road Planning Division, Planning and Research Department, Japan Highway Public Corporation
Kenji Sanbyakuda Member	Planning Division, Planning and Research Department, Japan Highway Public Corporation

5) JICA Coordinator

Name	Name of Organization
Toichi Iwata	Deputy Director, First Development Study Division, Social Development Study Department, JICA
Tokukiyo Hirai	First Development Study Division, Social Development Study Department, JICA
Shinichi Mori	First Development Study Division, Social Development Study Department, JICA

CHAPTER 2. EXISTING PHYSICAL AND SOCIO-ECONOMIC BACKGROUND

CHAPTER 2. EXISTING PHYSICAL AND SOCIO-ECONOMIC CONDITIONS

2.1 Physical Conditions

2.1.1 Climate

The study area is located between 6 to 7 degrees south of the equator and consequently has a tropical climate.

The seasons are influenced by the monsoons which blow in a general direction from the southeast from June to October and from the northwest or west from November to May.

Therefore, the seasons separate clearly, one is a dry season from June to October, the other is a rainy season from November to May.

Table 2.1.1 shows monthly rainfall and Table 2.1.2 shows monthly rainy days, both data are during the period from 1956 to 1976 and observed near the study area. The location of the rainfall stations are as shown in Fig. 7.3.1 for the whole study area. Rainfall varies according to altitude, with a total yearly rainfall from 1,000 mm to 2,000 mm in the lowland, from 2,000 mm to 3,000 mm in the highland and more than 3,000 mm in the mountain regions as shown in Fig. 2.1.1.

2.1.2 Topography

The study area is located in the northeast of West Java, in an area formed by the Northern Coastal Plain and the so-called Bogor Zone.

The lowland plain is about 40 km wide, extending from the West Coast (Sunda Strait) to the Bay of Cirebon and it is traversed by wide and shallow rivers running from the mountains in the south to the Java Sea in the north.

The portion of the Bogor Zone concerning the study area is mostly composed of low hills and ridges whose elevations are somewhere between 50 m to 200 m. An area which is above 200 m elevation is located at the north foot of Mt. Ciremay.

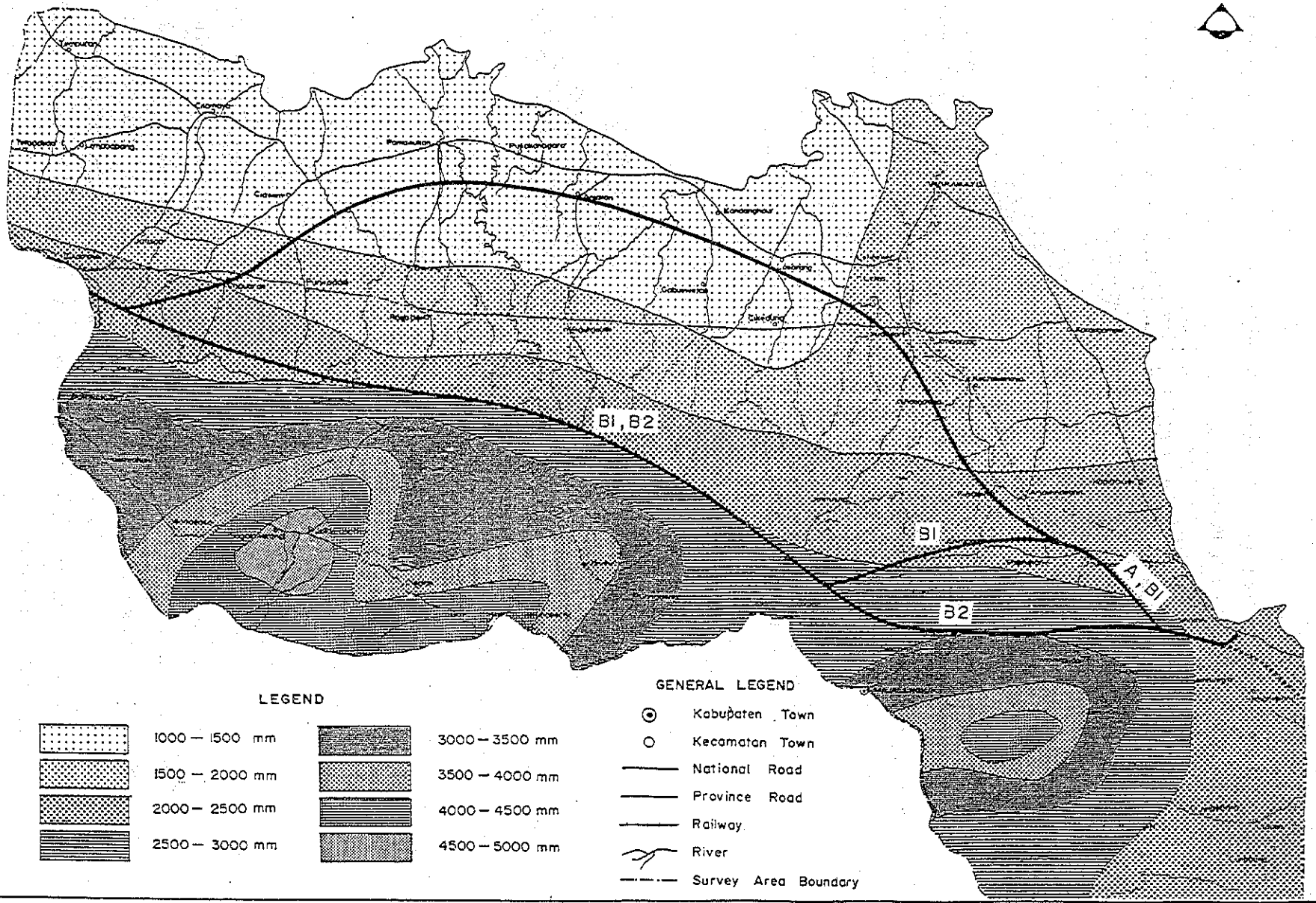
Table 2.1.1 Monthly Rainfall

(mm)

Sta. No.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
J-112a	368	306	248	191	162	71	48	29	34	124	206	237	2024
J-113b	325	274	213	134	126	62	52	36	33	81	175	215	1726
J-138	388	291	272	189	161	73	79	46	36	98	197	254	2084
J-156	483	423	448	343	268	126	92	59	79	228	328	389	3266
P-193	412	388	428	265	201	91	89	54	43	106	284	388	2749
P-194	346	292	364	326	228	93	93	57	43	159	309	376	2686
C-9	321	265	241	187	113	52	52	33	31	89	174	244	1802
C-14	367	295	257	161	120	54	48	42	33	74	147	241	1839
C-21	397	364	408	310	192	70	77	45	39	93	328	422	2745
C-41	575	560	590	326	201	107	101	57	39	112	306	538	3512
C-35	439	376	412	206	126	47	44	32	13	62	187	307	2251
Average	402	349	353	240	173	77	70	45	38	111	240	328	2426

Table 2.1.2 Monthly Rainy Days

Sta. No.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
J-112a	15	14	12	10	7	4	3	2	2	7	11	11	98
J-113b	17	15	13	8	8	5	3	2	3	6	10	14	104
J-138	19	17	16	12	10	6	5	3	4	7	12	14	125
J-156	19	19	20	16	13	6	5	4	4	10	16	19	151
P-193	17	15	16	11	8	4	3	2	3	6	12	17	114
P-194	18	15	18	16	12	5	6	4	2	8	14	18	136
C-9	18	15	15	12	8	4	4	2	3	5	11	16	113
C-14	16	13	14	9	7	4	4	3	2	4	8	13	97
C-21	18	17	18	14	9	5	4	2	2	6	13	18	126
C-41	18	16	17	13	8	4	4	2	2	6	12	17	119
C-35	19	17	18	12	9	4	3	2	1	5	10	16	116
Average	18	16	16	12	9	5	4	3	3	6	12	16	118



Feasibility Study on Cikampek - Cirebon Tollway Project

Fig. 2.1.1 Annual Rainfall

Plains and valleys are generally used for agriculture and they are developed under irrigation systems as rice fields.

The terrain configuration concerning the proposed tollway is described along the alternative routes, refer to Chapter 8, section 8.1 for further descriptions.

2.1.3 Geology

The geological structure of West Jawa, where Cikampek, Cirebon and Bandung are located, can be divided into two geological plains namely the Northern Coastal Plain and the Bogor Zone. Fig. 2.1.2 shows a rough sketch of the geological structure of these plains with their relationship to the alternative tollway routes proposed.

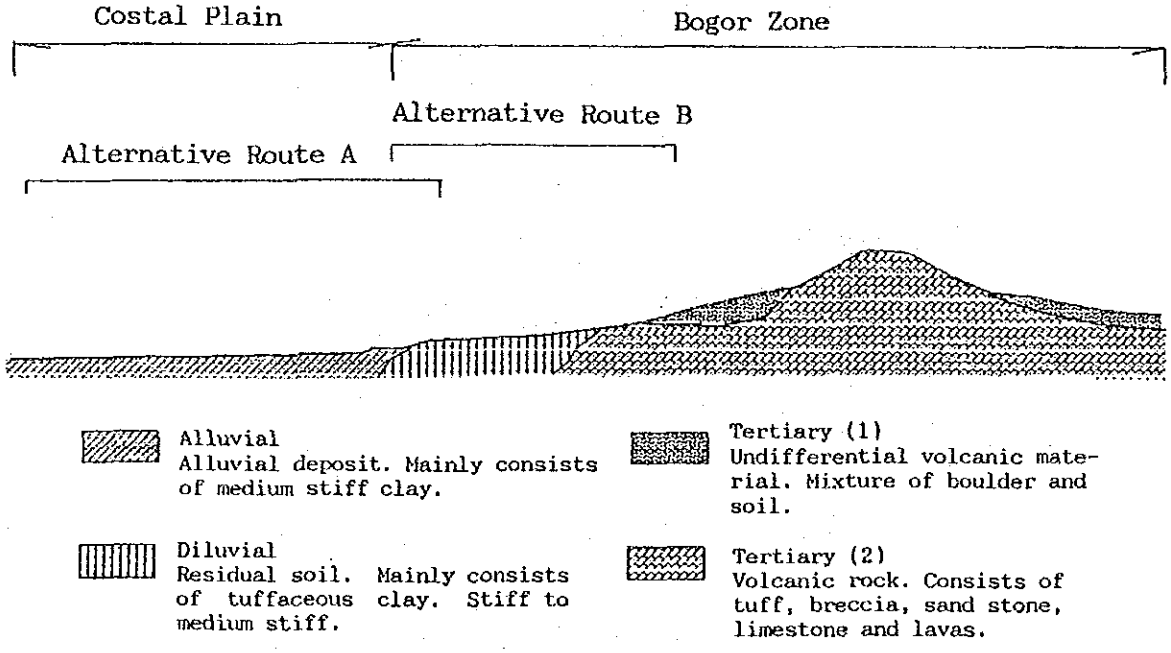


Fig. 2.1.2 Sketch of Geological Structure

The northern coastal plain consists of fluviatile, marine and volcanic alluvium clay with a thin layer of sand formed in the Holocen age. The central part consists of hilly and mountainous areas, which are named as the Bogor Zone. The hilly region is mainly composed of residual soil with highly weathered material of tuffaceous sandstone or clay stone, and the surface is mostly formed by reddish brown lateritic soil (latesol).

All units of the mountainous areas are comprised of volcanic material such as tuff, tuffaceous sand and clay stone, lime stone, lavas and such weathered material. As far as the civil engineering works are concerned, this mountainous unit should be divided into two areas, one of consolidated material and another of unconsolidated material (mixture of boulder and soil).

2.2. Existing Socio-Economic Conditions

2.2.1 Administrative Structure and Development Regions

The Republic of Indonesia is composed of the main islands of Java, Sumatra, Kalimantan, Sulawesi, Irian Jaya and over 13,000 other islands and has a total area of some two million square kilometers.

Administratively, the Republic of Indonesia has 5 levels of hierarchy (Fig. 2.2.1). At national level, the country is divided into 3 Special Districts (D.I. Aceh, D.K.I. Jakarta and D.I. Yogyakarta) and 24 Provinces.

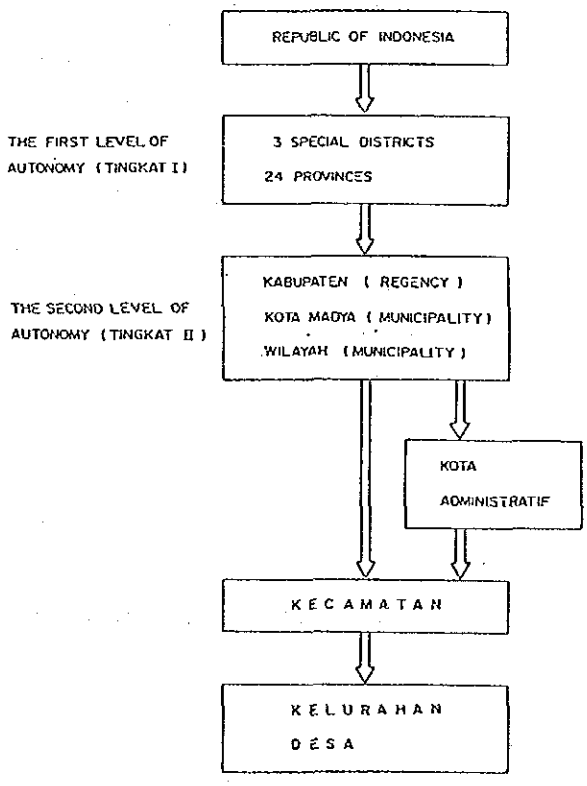


Fig. 2.2.1 Administrative Structure in Indonesia

The 27 provincial level development units (SWP-Provinces) are broken down into a total of 112 regional development units (SWP-Kabupatens) based on their functional hierarchies and service area of existing cities. These SWPs are the smallest regional development units and nearly always cover more than one Kabupaten. The project area lies in West Java Province and is composed of seven SWP (Kabupaten level) as shown in Fig. 2.2.2.

2.2.2 Population

The Republic of Indonesia has approximately 164 million population according to the 1985 Intercensus.

The population of Indonesia grew annually at 2.4% in the 1970's and at 2.2% from 1980 to 1985 (Table 2.2.1). Although the annual growth rate started to decline slightly in the 1980's, it is still a high growth rate. The proportions of urban population in Indonesia is 22.4% as from the 1980 census.

The population of Java is around 60% of the total population for Indonesia, however its land area only occupies around 7% of Indonesia. Java has about 100 million population (1985 Intercensus) and the annual population growth rate was at 2.0% in the 1970's and at 1.8% from 1980-85. Java has the highest ratio of urban population within Indonesia, at some 25.1% (1980 census).

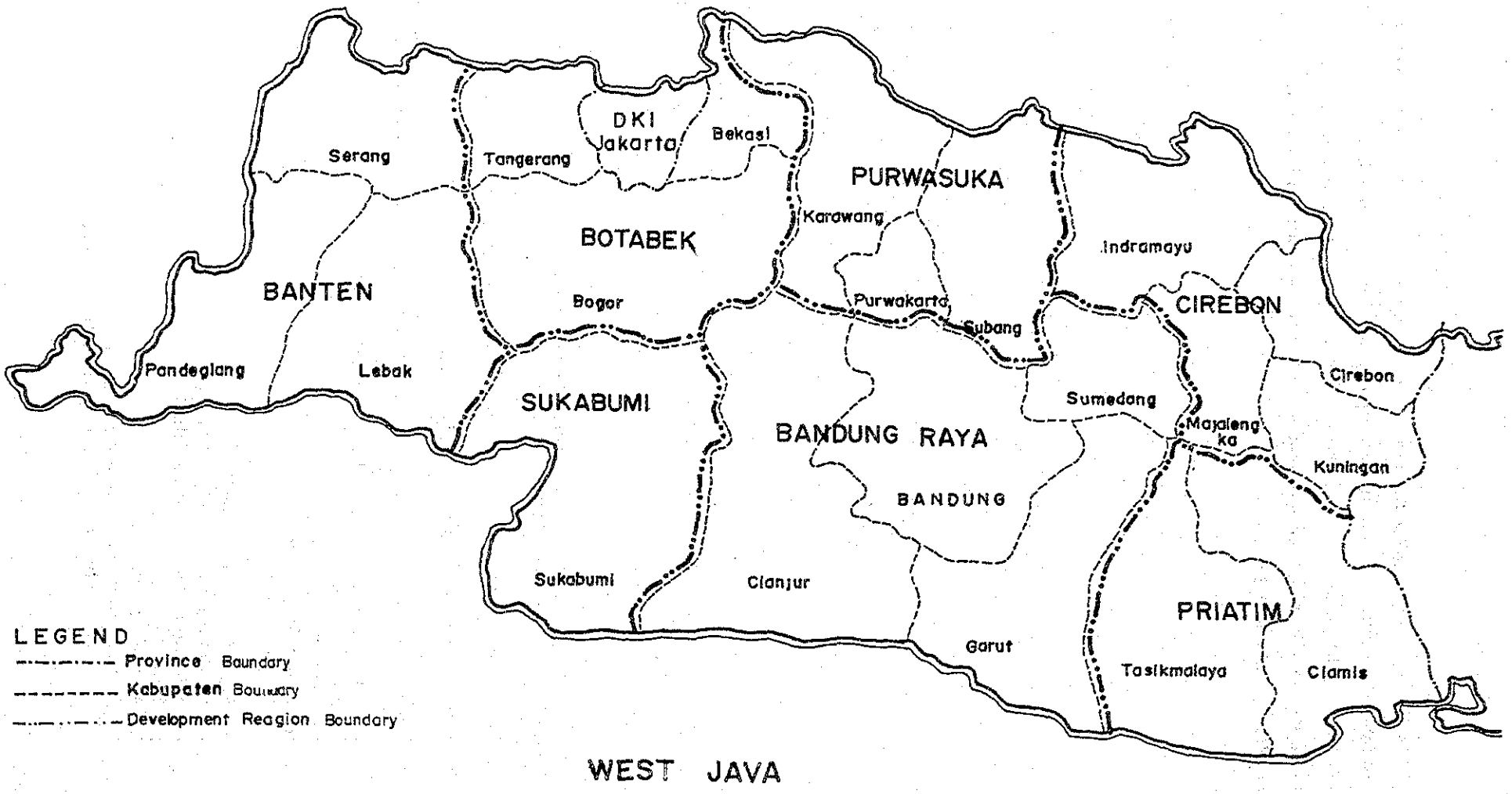
DKI Jakarta and West Java have approximately 7.9 and 30.8 million population respectively (1985 Intercensus) and the population grew annually at 4.0% and 2.7% during the 1970's, and 4.0% and 2.3% from 1980 to 1985, respectively. The total urban population of DKI Jakarta and West Java accounts for 52% of total urban population for Java according to the 1980 census.

The annual growth rate of most Kabupaten and Kotamadya in West Java exceeded 2.0% in the 1970's (See Table 2.2.2, and Figs. 2.2.3 and 2.2.4). However, the Kabupaten Bekasi, Kabupaten Bogor and Kabupaten Tangerang, which are all near DKI Jakarta, and Kabupaten Bandung, all exceeded an annual growth rate of 3.0%.

In the study area, the proportion of urban[1/] population of many Kecamatan which are near the main center of the Kabupaten are high. In particular, almost all the Kecamatan in Kabupaten Cirebon have a high urban population, but other Kecamatan in the study area have a very low urban population, refer to Tables 2.2.3 and 2.2.4; and Fig. 2.2.5.

Note[1/] Urban villages fulfil three criteria according to the national 1980 census procedures. These criteria were as follows:

1. Population density is more than 5,000 persons per km^2
2. Percentage of agricultural households are less than 25%
3. The number of facilities should consist of at least 8 of the following facilities
   a. The road can be passed by motorized vehicles
   b. Movie/cinema
   c. Elementary school
   d. Junior high school
   e. Senior high school
   f. Hospital
   g. Maternity clinic/hospital
   h. Community Health Center, Clinics
   i. Telephone receiver/Post Office
   j. Bank
   k. Manufacturing
   l. Market which has buildings
   m. Group of shops, consisting more than 10 shops etc.



Feasibility Study on Cikampek – Cirebon Tollway Project

Fig. 2.2.2 Administrative and Development Region Boundary in West Java

Table 2.2.1 Population of Indonesia

Unit: 1,000 persons

Island	1971 Census		1980 Census		1985 Intercensus	
Java	76,029	(64.2%)	91,217	(62.1%)	99,853	(60.9%)
D.K.I. Jakarta	4,546	(3.8%)	6,481	(4.4%)	7,886	(4.8%)
West Java	21,621	(18.3%)	27,450	(18.7%)	30,830	(18.8%)
D.I. Yogyakarta	2,489	(2.1%)	2,750	(1.9%)	2,930	(1.8%)
Central Java	21,865	(18.5%)	25,367	(17.3%)	26,945	(16.4%)
East Java	25,508	(21.5%)	29,169	(19.9%)	31,262	(19.1%)
Bali	2,120	(1.8%)	2,470	(1.7%)	2,649	(1.6%)
Sumatra	20,802	(17.6%)	27,995	(19.1%)	32,604	(19.9%)
Other Islands	19,417	(16.4%)	25,094	(17.1%)	28,941	(17.6%)
Indonesia	118,368	(100.0%)	146,776	(100.0%)	164,047	(100.0%)

Island	Area (km^2)	Density 1985 (persons/km^2)	Annual Growth Rate	
			1971/1980	1980/1985
Java	132,187	755.4	2.0%	1.8%
D.K.I. Jakarta	590	13,366.	4.0%	4.0%
West Java	46,300	665.9	2.7%	2.3%
D.I. Yogyakarta	3,169	924.6	1.1%	1.3%
Central Java	34,206	787.7	1.7%	1.2%
East Java	47,922	652.4	1.5%	1.4%
Bali	5,561	476.4	1.7%	1.4%
Sumatra	437,606	74.5	3.4%	3.1%
Other Islands	1,344,089	21.5	2.9%	2.9%
Indonesia	1,919,443	85.5	2.4%	2.2%

Unit: 1,000 persons

Island	1980 (Census)						
	Urban			Rural		Urban + Rural	
Java	22,871	(25.1%)	(69.6%)	68,348	(74.9%)	91,217	(100.0%)
D.K.I. Jakarta	6,072	(93.7%)	(18.5%)	409	(6.3%)	6,481	(100.0%)
West Java	5,716	(20.8%)	(17.4%)	21,734	(79.2%)	27,450	(100.0%)
D.I. Yogyakarta	607	(22.1%)	(1.8%)	2,143	(77.9%)	2,750	(100.0%)
Central Java	4,756	(18.7%)	(14.5%)	20,611	(81.3%)	25,367	(100.0%)
East Java	5,720	(19.6%)	(17.4%)	23,449	(80.4%)	29,169	(100.0%)
Bali	363	(14.7%)	(1.1%)	2,106	(85.3%)	2,470	(100.0%)
Sumatra	5,481	(19.6%)	(16.7%)	22,515	(80.4%)	27,995	(100.0%)
Other Islands	4,130	(16.5%)	(12.6%)	20,964	(83.5%)	25,094	(100.0%)
Indonesia	32,845	(22.4%)	(100.0%)	113,931	(77.6%)	146,776	(100.0%)

Source: Hasil Sensus Penduduk 1971, 1980
Hasil Survei Penduduk Antar Sensus 1985
and Statistik Indonesia 1987

Table 2.2.2 Population of DKI Jakarta and West Java

Unit: 1,000 persons

Kabupaten	1971 Census Population	Growth (% p.a) 1971/80	1980 Census Population		1980 Census Urban Population		1980 Census Rural Population	
DKI Jakarta*	4,546	4.0%	6,481	(100.0%)	6,072	(93.7%)	409	(6.3%)
Bekasi	831	3.6%	1,143	(100.0%)	189	(16.5%)	955	(83.5%)
Bogor	1,668	4.6%	2,494	(100.0%)	626	(25.1%)	1,868	(74.9%)
Bogor (KOD)	195	2.7%	247	(100.0%)	247	(100.0%)	0	(.0%)
Bogor+ (KOD)	1,863	4.4%	2,741	(100.0%)	873	(31.8%)	1,868	(68.2%)
Tangerang	1,067	4.1%	1,529	(100.0%)	233	(15.2%)	1,296	(84.8%)
Sukabumi	1,211	2.5%	1,518	(100.0%)	203	(13.4%)	1,315	(86.6%)
Sukabumi (KOD)	96	1.5%	110	(100.0%)	110	(100.0%)	0	(.0%)
Sukabumi+ (KOD)	1,307	2.5%	1,628	(100.0%)	313	(19.2%)	1,315	(80.8%)
Karawang	1,004	2.3%	1,237	(100.0%)	171	(13.8%)	1,065	(86.2%)
Purwakarta	371	2.4%	458	(100.0%)	79	(17.2%)	379	(82.8%)
Subang	898	1.9%	1,065	(100.0%)	108	(10.1%)	957	(89.9%)
Bandung (KOD)	1,200	2.2%	1,461	(100.0%)	1,461	(100.0%)	0	(.0%)
Bandung	1,985	3.3%	2,669	(100.0%)	638	(23.9%)	2,031	(76.1%)
Bandung+ (KOD)	3,186	2.9%	4,131	(100.0%)	2,100	(50.8%)	2,031	(49.2%)
Sumedang	638	1.4%	724	(100.0%	89	(12.3%)	635	(87.7%)
Cianjur	1,125	2.4%	1,388	(100.0%)	179	(12.9%)	1,208	(87.1%)
Garut	1,200	2.4%	1,483	(100.0%)	197	(13.3%)	1,286	(86.7%)
Indramayu	985	2.6%	1,237	(100.0%)	78	(6.3%)	1,159	(93.7%)
Cirebon (KOD)	179	2.5%	224	(100.0%)	195	(87.1%)	29	(12.9%)
Cirebon	1,042	2.8%	1,332	(100.0%)	236	(17.7%)	1,095	(82.3%)
Cirebon+ (KOD)	1,220	2.7%	1,555	(100.0%)	431	(27.7%)	1,124	(72.3%)
Majalengka	749	2.0%	898	(100.0%)	105	(11.7%)	793	(88.3%)
Kuningan	659	2.0%	786	(100.0%)	53	(6.7%)	734	(93.3%)
Ciamis	1,226	1.2%	1,368	(100.0%)	83	(6.1%)	1,285	(93.3%)
Tasikmalaya	1,313	2.2%	1,593	(100.0%)	241	(15.1%)	1,352	(84.9%)
Serang	859	2.9%	1,109	(100.0%)	122	(11.6%)	988	(89.0%)
Pendeglang	573	2.2%	695	(100.0%)	47	(6.8%)	647	(93.2%)
Lebak	546	2.5%	683	(100.0%)	26	(3.8%)	657	(96.2%)
West Java	21,621	2.7%	27,450	(100.0%)	5,716	(20.8%)	21,734	(79.2%)
West Java+JKT	26,167	2.9%	33,930	(100.0%)	11,788	(34.7%)	22,143	(65.3%)

Notes: * Province (KOD) Kotamadya
Source: Hasil Census Penduduk 1971, 1980

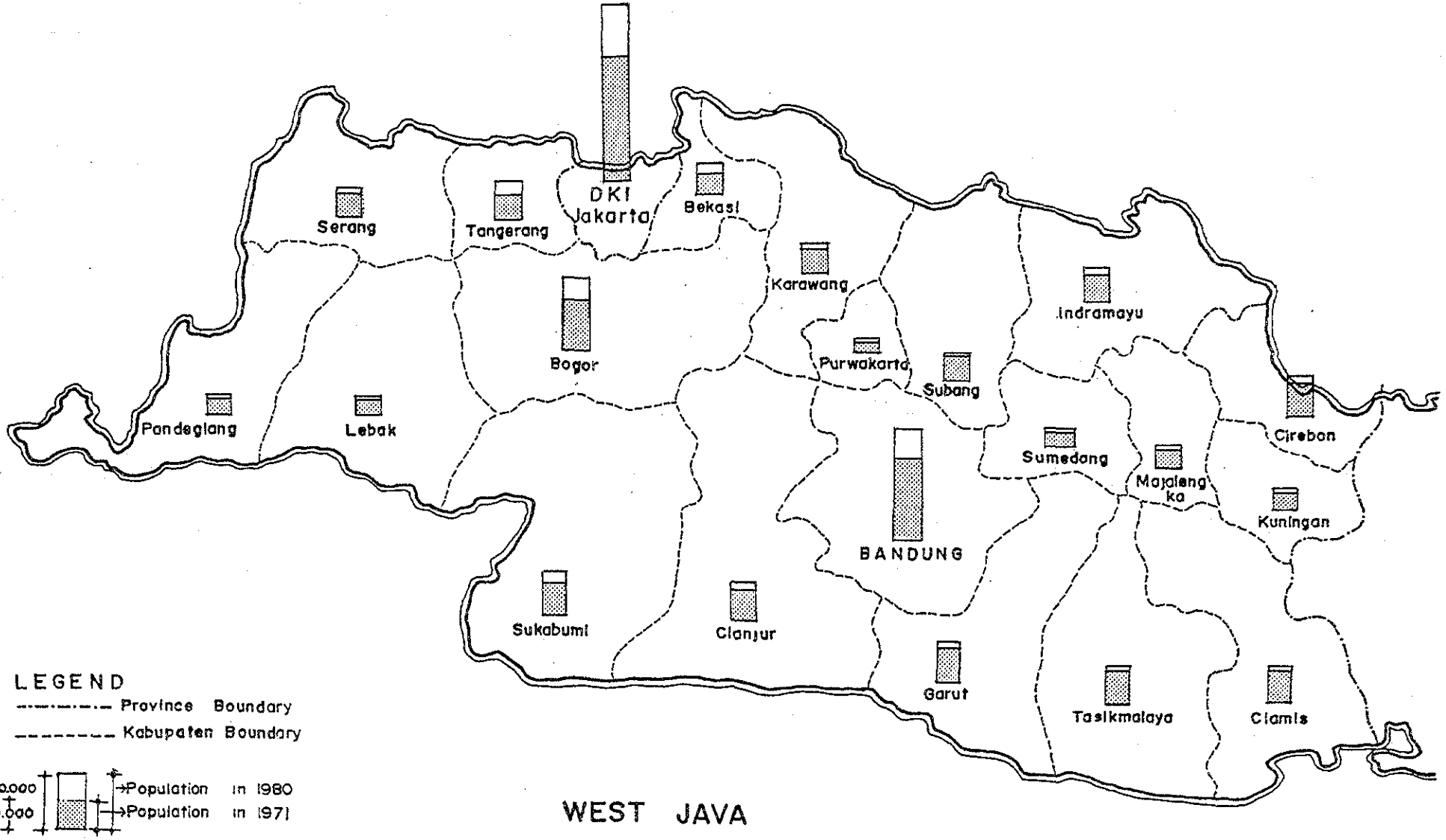


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Fig. 2.2.3 Population Growth in West Java

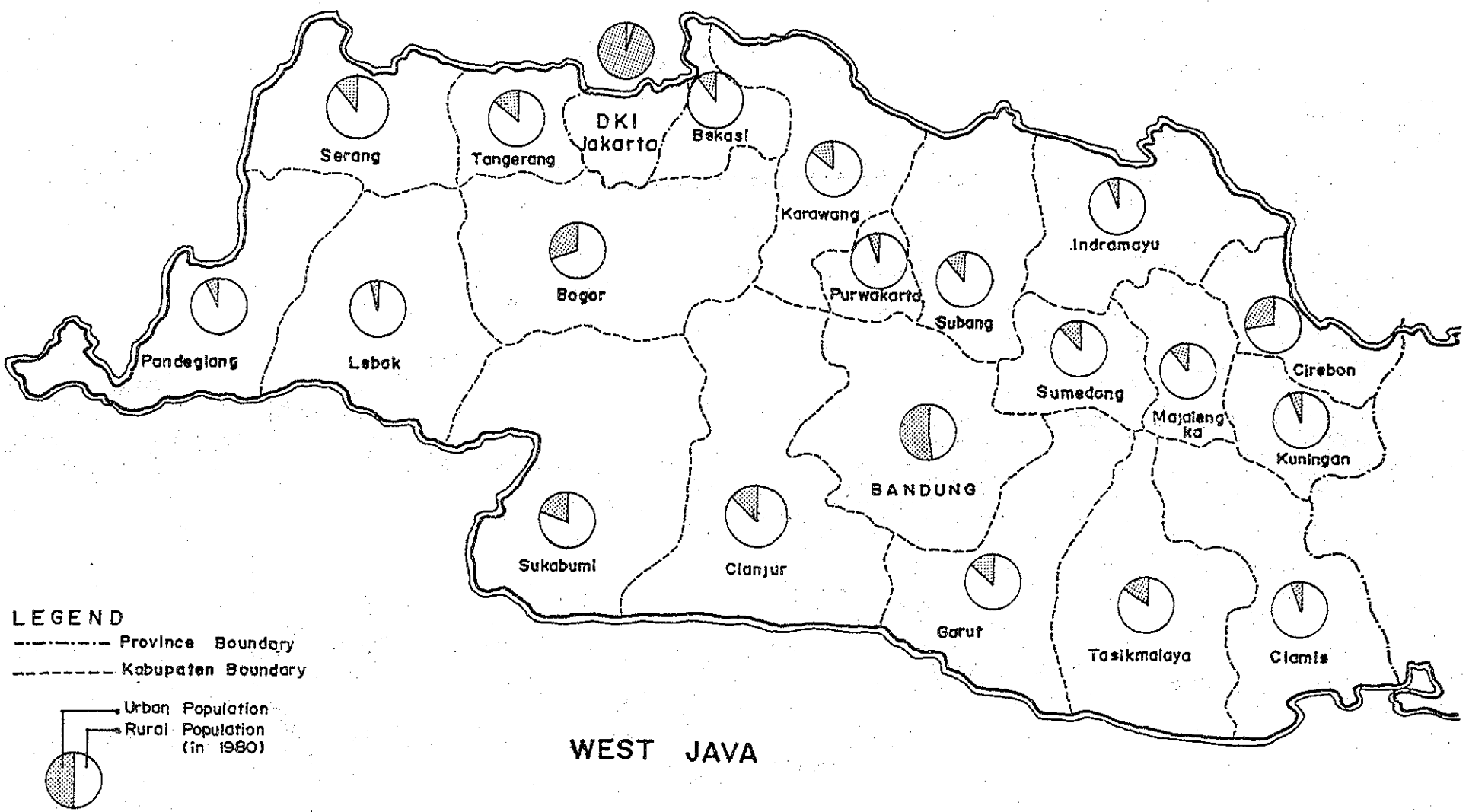

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Fig. 2.2.4 Proportion of Urban Population in West Java

Table 2.2.3 Population of Kecamatan (1)

UNIT 1,000 PERSONS

KABUPATEN	KECAMATAN	1980(Census) URBAN+RURAL	URBAN	RURAL
PURWAKARTA		458(100.0%)	79(17.2%)	379(82.8%)
P1	Campaka	57(100.0%)	0(.0%)	57(100.0%)
P2	Pasawahan	40(100.0%)	0(.0%)	40(100.0%)
P3	Puruwakarta	117(100.0%)	62(53.0%)	55(47.0%)
P4	Jatiluhur	43(100.0%)	7(16.3%)	36(83.7%)
P5	Plered	96(100.0%)	10(10.4%)	86(89.6%)
P6	Darangdan	63(100.0%)	0(.0%)	63(100.0%)
P7	Wanayasa	42(100.0%)	0(.0%)	42(100.0%)
SUBANG		1,065(100.0%)	108(10.1%)	957(89.9%)
SB1	Pabuaran	107(100.0%)	0(.0%)	107(100.0%)
SB2	Purwadadi	59(100.0%)	0(.0%)	59(100.0%)
SB3	Ciasem	121(100.0%)	0(.0%)	121(100.0%)
SB4	Pagaden	110(100.0%)	14(12.7%)	96(87.3%)
SB5	Binong	93(100.0%)	0(.0%)	93(100.0%)
SB6	Pusakanagara	97(100.0%)	0(.0%)	97(100.0%)
SB7	Pamanukan	92(100.0%)	20(21.7%)	72(78.3%)
SB8	Kalijati	81(100.0%)	14(17.3%)	67(82.7%)
SB9	Subang	135(100.0%)	52(38.5%)	83(61.5%)
SB10	Sagalaherang	78(100.0%)	0(.0%)	78(100.0%)
SB11	Cisalak	91(100.0%)	9(9.9%)	82(90.1%)
SUMEDANG		724(100.0%)	89(12.3%)	635(87.7%)
SM1	Cikeruh	73(100.0%)	9(12.3%)	64(87.7%)
SM2	Tanjungsari	75(100.0%)	7(9.3%)	68(90.7%)
SM3	Sumedang Selatan	57(100.0%)	34(59.6%)	23(40.4%)
SM4	Sumedang Utara	63(100.0%)	24(38.1%)	39(61.9%)
SM5	Rancakalong	43(100.0%)	0(.0%)	43(100.0%)
SM6	Tanjungkerta	46(100.0%)	0(.0%)	46(100.0%)
SM7	Cimalaka	56(100.0%)	8(14.3%)	48(85.7%)
SM8	Buahdua	37(100.0%)	0(.0%)	37(100.0%)
SM9	Darmaraja	57(100.0%)	0(.0%)	57(100.0%)
SM10	Wado	54(100.0%)	7(13.0%)	47(87.0%)
SM11	Cadasngampar	25(100.0%)	0(.0%)	25(100.0%)
SM12	Tomo	43(100.0%)	0(.0%)	43(100.0%)
SM13	Situraja	46(100.0%)	0(.0%)	46(100.0%)
SM14	Conggeang	50(100.0%)	0(.0%)	50(100.0%)
INDRAMAYU		1,237(100.0%)	78(6.3%)	1,159(93.7%)
I1	Anjatan	142(100.0%)	0(.0%)	142(100.0%)
I2	Cikedung	72(100.0%)	0(.0%)	72(100.0%)
I3	Losarang	41(100.0%)	0(.0%)	41(100.0%)
I4	Kandanghaur	97(100.0%)	7(7.2%)	90(92.8%)
I5	Lelea	40(100.0%)	0(.0%)	40(100.0%)
I6	Jatibarang	57(100.0%)	15(26.3%)	42(73.7%)
I7	Indramayu	88(100.0%)	34(38.6%)	54(61.4%)
I8	Lohbener	67(100.0%)	0(.0%)	67(100.0%)
I9	Sindang	59(100.0%)	4(6.8%)	55(93.2%)
I10	Haurgeulis	96(100.0%)	0(.0%)	96(100.0%)
I11	Gabuswetan	85(100.0%)	0(.0%)	85(100.0%)
I12	Bangodua	91(100.0%)	0(.0%)	91(100.0%)
I13	Kertasemaya	65(100.0%)	6(9.2%)	59(90.8%)
I14	Krangkeng	43(100.0%)	0(.0%)	43(100.0%)
I15	Karangampel	76(100.0%)	12(15.8%)	64(84.2%)
I16	Juntinyuat	65(100.0%)	0(.0%)	65(100.0%)
I17	Sliyeg	54(100.0%)	0(.0%)	54(100.0%)

Source:HASIL SENSUS PENDUDUK 1980

Table 2.2.4 Population of Kecamatan (2)

UNIT 1,000 PERSONS

KABUPATEN	KECAMATAN	1980(Census) URBAN+RURAL	URBAN	RURAL
CIREBON		1,555(100.0%)	431(27.7%)	1,124(72.3%)
C1	Arjawinangun	64(100.0%)	19(29.7%)	45(70.3%)
C2	Susukan	42(100.0%)	0(.0%)	42(100.0%)
C3	Gegesik	75(100.0%)	0(.0%)	75(100.0%)
C4	Kapetakan	65(100.0%)	7(10.8%)	58(89.2%)
C5	Sumber	48(100.0%)	0(.0%)	48(100.0%)
C6	Palimanan	60(100.0%)	11(18.3%)	49(81.7%)
C7	Plumbon	89(100.0%)	28(31.5%)	61(68.5%)
C8	Weru	83(100.0%)	24(28.9%)	59(71.1%)
C9	Klangenan	60(100.0%)	20(33.3%)	40(66.7%)
C10	Ciwaringin	42(100.0%)	5(11.9%)	37(88.1%)
C11	CIREBON(KOD)	224(100.0%)	195(87.1%)	29(12.9%)
C12	Astanajapura	110(100.0%)	0(.0%)	110(100.0%)
C13	Cirebon Selatan	33(100.0%)	0(.0%)	33(100.0%)
C14	Cirebon Barat	51(100.0%)	28(54.9%)	23(45.1%)
C15	Cirebon Utara	46(100.0%)	14(30.4%)	32(69.6%)
C16	Beber	41(100.0%)	0(.0%)	41(100.0%)
C17	Lemahabang	81(100.0%)	17(21.0%)	64(79.0%)
C18	Karangsembung	57(100.0%)	11(19.3%)	46(80.7%)
C19	Waled	57(100.0%)	4(7.0%)	53(93.0%)
C20	Cileduk	73(100.0%)	40(54.8%)	33(45.2%)
C21	Losari	66(100.0%)	0(.0%)	66(100.0%)
C22	Babakan	89(100.0%)	9(10.1%)	80(89.9%)
MAJALENGKA		898(100.0%)	105(11.7%)	793(88.3%)
M1	Kertajati	33(100.0%)	0(.0%)	33(100.0%)
M2	Jatitujuh	41(100.0%)	0(.0%)	41(100.0%)
M3	Jatiwangi	77(100.0%)	22(28.6%)	55(71.4%)
M4	Dawuan	66(100.0%)	6(9.1%)	60(90.9%)
M5	Ligung	49(100.0%)	0(.0%)	49(100.0%)
M6	Rajagaluh	53(100.0%)	6(11.3%)	47(88.7%)
M7	Leuwimunding	63(100.0%)	7(11.1%)	56(88.9%)
M8	Sumberjaya	50(100.0%)	0(.0%)	50(100.0%)
M9	Lemahsugih	37(100.0%)	0(.0%)	37(100.0%)
M10	Bantarujeg	62(100.0%)	0(.0%)	62(100.0%)
M11	Cikijing	70(100.0%)	6(8.6%)	64(91.4%)
M12	Talaga	53(100.0%)	9(17.0%)	44(83.0%)
M13	Argapura	27(100.0%)	0(.0%)	27(100.0%)
M14	Maja	37(100.0%)	9(24.3%)	28(75.7%)
M15	Majalengka	74(100.0%)	19(25.7%)	55(74.3%)
M16	Sukahaji	47(100.0%)	0(.0%)	47(100.0%)
M17	Kadipaten	58(100.0%)	20(34.5%)	38(65.5%)

Source:HASIL SENSUS PENDUDUK 1980

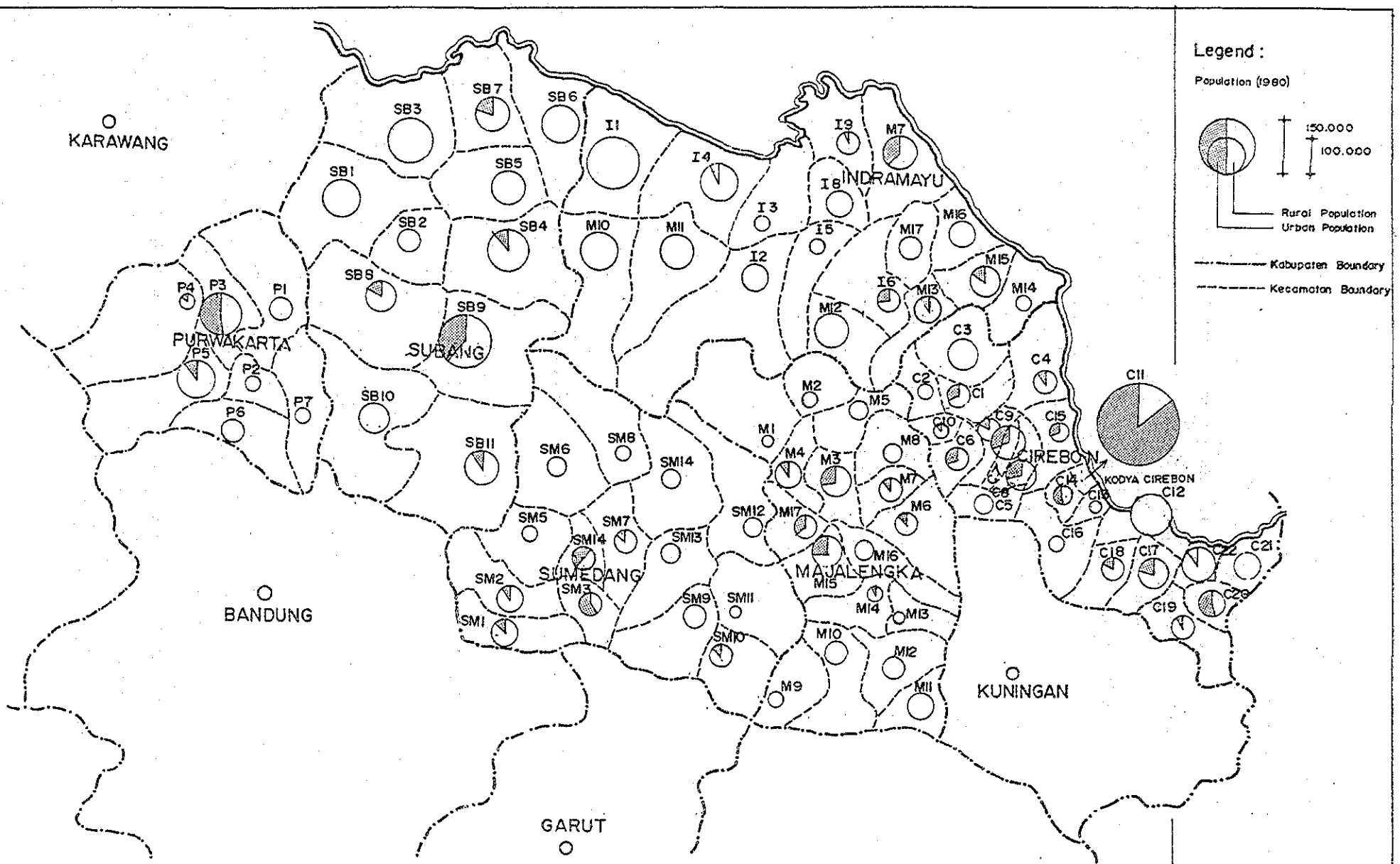

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Fig. 2.2.5 Proportion of Urban and Rural Population in Study Area

2.2.3 Employment

In the Indonesian census system the population aged 10 years and over is divided into "economically active" and "economically non-active" groups. The former is defined as the "labour force" and is further sub-divided into "employed" and "unemployed" groups (refer to Fig. 2.2.6).

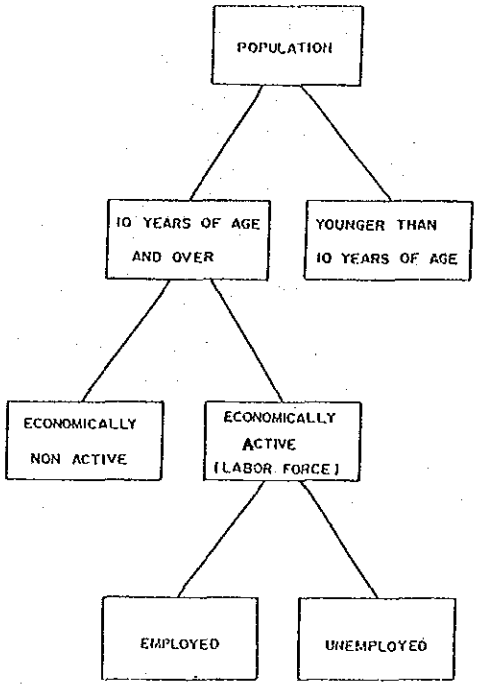


Fig. 2.2.6 Hierarchical Definition of Employed Population in Indonesia

In all regions except DKI Jakarta, the labour force participation rate in the rural areas is higher than in the urban areas (refer to Table 2.2.5). The rate in West Java is 5% lower than the Indonesia average as in the 1980 census.

Labour force participation rate in DKI Jakarta is decreasing, but in other regions it either remains steady or has increased, see Table 2.2.6.

In all regions, the proportion of primary sector is decreasing and this is true of West Java, however the secondary and tertiary sector increased, see Table 2.2.7.

In particular the tertiary sector in West Java increased from 28.9% in 1971 census to 37.7% in the 1985 census, this is higher than the respective Indonesia averages of 24.9% and 31.9%.

Table 2.2.5 Employment in Urban and Rural Areas

IN 1980

	DKI JAKARTA	WEST JAVA	CENTRAL JAVA
(Urban Area)			
Population >=10 years	4,414,903	4,149,525	3,542,150
Econ. Active Pop.	1,895,615	1,590,532	1,674,137
L.F.P.R.*	42.9%	38.3%	47.3%
(Rulal Area)			
Population >=10 years	269,321	14,963,181	14,850,269
Econ. Active Pop.	108,863	7,018,769	8,385,366
L.F.P.R.*	40.4%	46.9%	56.5%
(Urban + Rural)			
Population >=10 years	4,684,224	19,112,706	18,392,419
Econ. Active Pop.	2,004,478	8,609,301	10,059,503
L.F.P.R.*	42.8%	45.0%	54.7%

	YOGYAKARTA	EAST JAVA	BALI
(Urban Area)			
Population >=10 years	481,477	4,357,503	274,450
Econ. Active Pop.	204,292	1,962,317	122,033
L.F.P.R.*	42.4%	45.0%	44.5%
(Rulal Area)			
Population >=10 years	1,637,991	17,462,888	1,528,717
Econ. Active Pop.	1,038,027	9,546,966	842,605
L.F.P.R.*	63.4%	54.7%	55.1%
(Urban + Rural)			
Population >=10 years	2,119,468	21,820,391	1,803,167
Econ. Active Pop.	1,242,319	11,509,283	964,638
L.F.P.R.*	58.6%	52.7%	53.5%

	SUMATRA	OTHER ISLANDS	INDONESIA
(Urban Area)			
Population >=10 years	3,917,868	2,952,815	24,090,691
Econ. Active Pop.	1,441,646	1,078,359	9,968,931
L.F.P.R.*	36.8%	36.5%	41.4%
(Rulal Area)			
Population >=10 years	15,189,524	14,359,988	80,261,879
Econ. Active Pop.	8,129,853	7,113,965	42,184,414
L.F.P.R.*	53.5%	49.5%	52.6%
(Urban + Rural)			
Population >=10 years	19,107,392	17,312,803	104,352,570
Econ. Active Pop.	9,571,499	8,192,324	52,153,345
L.F.P.R.*	50.1%	47.3%	50.0%

Note:* Labour Force Participate Rate
Source: HASIL SENSUS PENDUDUK 1980

Table 2.2.6 Employment Growth

DKI JAKARTA	1971	1980	1985
Population >=10 years	3,126,414	4,684,224	5,965,228
Econ. Active Pop.	1,351,394	2,004,478	2,538,847
L.F.P.R.*	43.2%	42.8%	42.6%
WEST JAVA	**1971**	**1980**	**1985**
Population >=10 years	14,418,587	19,112,706	22,356,898
Econ. Active Pop.	6,689,323	8,609,301	10,777,380
L.F.P.R.*	46.4%	45.0%	48.2%
CENTRAL JAVA	**1971**	**1980**	**1985**
Population >=10 years	15,030,818	18,392,419	20,229,260
Econ. Active Pop.	8,116,468	10,059,503	11,553,916
L.F.P.R.*	54.0%	54.7%	57.1%
YOGYAKARTA	**1971**	**1980**	**1985**
Population >=10 years	1,795,409	2,119,468	2,337,366
Econ. Active Pop.	1,020,837	1,242,319	1,428,529
L.F.P.R.*	56.9%	58.6%	61.1%
EAST JAVA	**1971**	**1980**	**1985**
Population >=10 years	17,898,210	21,820,391	24,040,680
Econ. Active Pop.	9,754,456	11,509,283	13,571,231
L.F.P.R.*	54.5%	52.7%	56.5%
BALI	**1971**	**1980**	**1985**
Population >=10 years	1,430,495	1,803,167	2,061,621
Econ. Active Pop.	732,736	964,638	1,259,092
L.F.P.R.*	51.2%	53.5%	61.1%
SUMATRA	**1971**	**1980**	**1985**
Population >=10 years	13,800,633	19,107,392	22,863,335
Econ. Active Pop.	7,162,372	9,571,499	11,980,091
L.F.P.R.*	51.9%	50.1%	52.4%
OTHER ISLANDS	**1971**	**1980**	**1985**
Population >=10 years	28,880,609	17,312,803	20,525,628
Econ. Active Pop.	6,433,630	8,192,324	10,716,529
L.F.P.R.*	22.3%	47.3%	52.2%
INDONESIA	**1971**	**1980**	**1985**
Population >=10 years	96,381,175	104,352,570	120,380,016
Econ. Active Pop.	41,261,216	52,153,345	63,825,615
L.F.P.R.*	42.8%	50.0%	53.0%

Note: * Labour Force Participation Rate
Source: HASIL SENSUS PENDUDUK 1971,1980
HASIL SURVEI PENDUDUK ANTER SENSUS 1985

Table 2.2.7 Employment Composition by Industrial Sector

DKI JAKARTA	1971		1980		1985	
Primary Sector	42,035	3.57%	36,922	1.92%	20,519	.86%
Secondary Sector	206,988	17.56%	438,829	22.77%	582,777	24.33%
Tertiary Sector	929,992	78.88%	1,451,883	75.32%	1,792,141	74.81%
Total Employed	1,179,015	100.00%	1,927,634	100.00%	2,395,437	100.00%

WEST JAVA	1971		1980		1985	
Primary Sector	3,490,056	61.06%	4,062,242	47.79%	4,889,178	46.76%
Secondary Sector	569,854	9.97%	1,325,273	15.59%	1,621,922	15.51%
Tertiary Sector	1,655,590	28.97%	3,113,428	36.62%	3,944,391	37.73%
Total Employed	5,715,500	100.00%	8,500,943	100.00%	10,455,491	100.00%

CENTRAL JAVA	1971		1980		1985	
Primary Sector	4,923,882	63.57%	5,408,177	54.27%	5,778,432	50.90%
Secondary Sector	929,727	12.00%	1,582,838	15.88%	1,886,472	16.62%
Tertiary Sector	1,892,178	24.43%	2,975,168	29.85%	3,686,759	32.48%
Total Employed	7,745,787	100.00%	9,966,183	100.00%	11,351,663	100.00%

YOGYAKARTA	1971		1980		1985	
Primary Sector	559,964	56.70%	649,277	52.60%	727,853	51.96%
Secondary Sector	179,141	18.14%	204,287	16.55%	247,680	17.68%
Tertiary Sector	248,561	25.17%	380,774	30.85%	425,286	30.36%
Total Employed	987,666	100.00%	1,234,338	100.00%	1,400,819	100.00%

EAST JAVA	1971		1980		1985	
Primary Sector	6,185,663	68.27%	6,445,542	56.56%	7,314,213	54.78%
Secondary Sector	638,046	7.04%	1,436,948	12.61%	1,785,928	13.38%
Tertiary Sector	2,237,073	24.69%	3,514,240	30.84%	4,252,465	31.85%
Total Employed	9,060,782	100.00%	11,396,730	100.00%	13,352,606	100.00%

BALI	1971		1980		1985	
Primary Sector	466,226	69.18%	482,224	50.74%	649,459	52.34%
Secondary Sector	59,333	8.80%	152,999	16.10%	235,903	19.01%
Tertiary Sector	148,327	22.01%	315,197	33.16%	355,556	28.65%
Total Employed	673,886	100.00%	950,420	100.00%	1,240,918	100.00%

SUMATRA	1971		1980		1985	
Primary Sector	4,814,441	75.41%	6,452,823	67.89%	7,748,549	66.02%
Secondary Sector	351,862	5.51%	803,048	8.45%	973,905	8.30%
Tertiary Sector	1,217,660	19.07%	2,248,851	23.66%	3,013,997	25.68%
Total Employed	6,383,963	100.00%	9,504,722	100.00%	11,736,451	100.00%

OTHER ISLANDS	1971		1980		1985	
Primary Sector	4,454,082	75.74%	5,296,834	65.62%	7,013,606	66.65%
Secondary Sector	392,498	6.67%	846,317	10.48%	1,042,136	9.90%
Tertiary Sector	1,034,477	17.59%	1,929,001	23.90%	2,468,011	23.45%
Total Employed	5,881,057	100.00%	8,072,152	100.00%	10,523,753	100.00%

INDONESIA	1971		1980		1985	
Primary Sector	24,936,349	66.27%	28,834,041	55.93%	34,141,809	54.66%
Secondary Sector	3,327,449	8.84%	6,790,539	13.17%	8,376,723	13.41%
Tertiary Sector	9,363,858	24.89%	15,928,542	30.90%	19,938,606	31.92%
Total Employed	37,627,656	100.00%	51,553,122	100.00%	62,457,138	100.00%

Source: HASIL SENSUS PENDUDUK 1971,1980
HASIL SURVEI PENDUDUK ANTER SENSUS 1985

2.2.4 Economic Trends

1) Indonesian Economy

After a decade of nearly 8 percent annual growth during the 1970's, supported mainly by the international oil market, growth slowed drastically as a result of sharp drops in oil prices in the 1980's. Average growth in the past 3 years is estimated at 3.8 percent a year. Indonesia is also operating under a greatly enlarged debt burden, the outgrowth of low oil revenues as well as a spate of repayments now coming due on commercial borrowing from the early 1980's, and more recently, the depreciation of the U.S. dollar vis-a-vis the European currencies and the yen.

Responding to these changes in the external economic environment, the Indonesian Government initiated a number of economic policy changes. First, the government adopted a set of austere macroeconomic policies. These include lean government budgets and anti-inflationary monetary targets of the past 3 years and a 31.2 percent rupiahs (Rp.) devaluation in September 1986, all aimed at arresting the external deficit and maintaining domestic fiscal stability. Second, the Indonesian authorities adopted a range of measures to strengthen domestic capital formation, attract direct foreign investment, and promote the non-oil sector. Measures in this category came to be known as "deregulation" reforms, because their emphasis was on reducing burdensome trade and investment regulations and moving toward increased reliance on market forces.

The non-oil sector has clearly benefitted from the deregulation measures and the devaluation: industrial production now accounts for around 15 percent of GDP compared with 11 percent 5 years ago; non-oil exports totaled $9.4 billion during FY 1987/88, up more that 40 percent from the previous year; and last year was the first in recent Indonesian history that non-oil exports were greater than oil exports.

Austerity has its costs, however. The economic growth rate is below 5 percent per annum, the minimum rate Indonesia must maintain (with an appropriate sector balance) in order to absorb the two million new workers who enter the work force each year. Per capita income in 1987 was $393 compared with $531 in 1984, the drop resulting to a large extent from the devaluation. On the monetary side, high real interest rates, currently around 8-10 percent (3-month time deposit rate is around 18 percent), have been a financial burden for Indonesia companies.

According to the latest World Bank estimates, real GDP grew by 3.7 percent in 1987, virtually the same as the 3.6 percent growth of the previous year. This growth rate implies a nominal GDP of around Rp. 109 trillion ($66.1 billion), and a per capita GDP of $393. Indonesian per capita income has declined sharply over the past few years, as measures in dollar terms, mostly as the result of the September 1986 devaluation. If the effects of devaluation are excluded, per capita growth has been about 4 percent per year.

The inflation rate (CPI) in 1987 was 8.9 percent, a noteworthy achievement in view of the devaluation. The inflation trend appears on a downward path: during the first quarter of 1988 the CPI increased by 0.92 percent, compared with 1.53 percent for the first quarter of last year.

Key economic indicators for Indonesia are summarized in Table 2.2.8.

2) Regional Economy

Despite the recent recessionary economy in Indonesia, Java and West Java in the 1980's retained higher growth rates than the national level. The relative share of GRDP in Java and West Java increased steadily from 50.3% and 14.4% of national GDP in 1979 to 56.1% and 15.8% in 1985, respectively (see Table 2.2.9).

The GRDP per capita in West Java increased from 78.5 in 1980 to 84.2 in 1985 (Indonesia = 100). The annual growth rate of West Java during 1980-1985 exceeded the annual growth rate of Indonesia (refer to Table 2.2.10).

The GRDP composition and growth show a declining share in the primary sector through all regions except for Sumatra. DKI Jakarta shows a conspicuous sectoral composition with the dominant share in tertiary sector of 73% of the total GRDP in 1984. The secondary sector share in DKI Jakarta and West Java are 25.7% and 28.5% respectively, and they are about 10% point higher than other provinces in Java Island. Contrary to this, the primary sector of DKI Jakarta and West Java share less percentage than that of other provinces in Java Island as shown in Table 2.2.11.

Table 2.2.8 Key Economic Indicators for Indonesia

	1985	1986	1987	1988
Population (million midyear)	163	166	170	174
GDP (billions of Rupiah, 1983 constant prices)	80,119	83,318	86,307	89,759
GDP ($ million, constant prices)	48,764	50,711	52,530	53,590
GDP per capita ($ at 1987 exchange rate)	354	349	410	435
GDP per capita ($ at prevailing exchange rate)	522	433	393	435
GDP (% growth in constant 1983 rupiah prices)	2.3	4.0	3.6	4.2
Consumer Price Index (1977/78 = 100)	252.2	275.3	299.8	320.5
Growth in Consumer Prices	4.6	9.1	8.9	6.9
Official Int'l Reserves ($ million-Dec. 31)	5,880	5,411	6,911	6,546
External Official Debt (Disbursed - $million-Dec. 31)	23,887	30,101	35,200	36,000
Debt Service ($ million)	4,037	4,400	5,213	N/A
Government Budget (billions of Rupiahs)	FY 85/86 Actual	FY 86/87 Actual	FY 87/88 Actual	FY 88/89 Budget
Routine Expenditures	11,151	13,559	17,481	20,066
Development Expenditures	10,873	8,332	9,477	8,897
Domestic Revenues	19,253	16,140	20,803	21,803
Dev. Receipts (external loans and grants)	3,572	5,752	6,158	7,160
External Trade ($ million)	FY 85/86 Actual	FY 86/87 Actual	FY 87/88 Actual	FY 88/89 Budget
Exports, Merchandise (F.O.B.)	18,612	13,697	18,343	18,986
Oil and LNG	12,437	6,966	8,841	8,174
Non-oil	6,175	6,731	9,502	10,812
Imports, Merchandise (F.O.B.)	14,200	11,451	12,952	13,271
Oil and LNG	3,200	2,095	2,355	2,082
Non-oil	11,000	9,356	10,597	11,189

Source: Economic Trends Report Indonesia, Dec. 1988, Embassy of USA in Jakarta

Table 2.2.9 Annual Growth of GRDP in Indonesia

UNIT : Rp. Billion, 1975 Constant Price

REGION	1979		1980		1981		1982	
SUMATRA	4,813	29.2%	5,130	28.5%	5,371	27.4%	5,531	27.0%
JAVA	8,275	50.3%	9,277	51.5%	10,404	53.1%	11,044	54.0%
DKI JAKARTA	1,527	9.3%	1,668	9.3%	1,950	10.0%	2,222	10.9%
WEST JAVA	2,365	14.4%	2,634	14.6%	2,934	15.0%	3,109	15.2%
OTHER PROVINCES	4,383	26.6%	4,974	27.6%	5,520	28.2%	5,713	27.9%
OTHER ISLANDS	3,373	20.5%	3,610	20.0%	3,809	19.5%	3,892	19.0%
INDONESIA	16,461	100.0%	18,017	100.0%	19,584	100.0%	20,467	100.0%

REGION	1983		1984		1985	
SUMATRA	5,642	25.8%	5,916	24.7%	*	(*)
JAVA	11,969	54.7%	13,101	54.7%	13,739	56.1%
DKI JAKARTA	2,541	11.6%	2,916	12.2%	3,039	12.4%
WEST JAVA	3,265	14.9%	3,654	15.3%	3,878	15.8%
OTHER PROVINCES	6,163	28.2%	6,531	27.3%	6,822	27.9%
OTHER ISLANDS	4,282	19.6%	4,937	20.6%	*	(*)
INDONESIA	21,893	100.0%	23,954	100.0%	24,496	100.0%

REGION	ANNUAL GROWTH RATE						
	1979/1980	1980/1981	1981/1982	1982/1983	1983/1984	1984/1985	1979/1985
SUMATRA	6.6%	4.7%	3.0%	2.0%	4.9%	*	*
JAVA	12.1%	12.2%	6.1%	8.4%	9.5%	4.9%	8.8%
DKI JAKARTA	93.0%	16.9%	14.0%	14.3%	14.8%	4.2%	12.2%
WEST JAVA	11.4%	11.4%	6.0%	5.0%	11.9%	6.1%	8.6%
OTHER PROVINCE	13.5%	11.0%	3.5%	7.9%	6.0%	4.5%	7.7%
OTHER ISLANDS	7.0%	5.5%	2.2%	10.0%	15.3%	*	*
INDONESIA	9.5%	8.7%	4.5%	7.0%	9.4%	230.0%	6.8%

Note : * DATA NOT AVAILABLE

Source : PENDAPATAN REGIONAL PROVINSI-PROVINSI DI INDONESIA 1979-1984
STATISTIK INDONESIA 1987
PENDAPATAN JAKARTA 1983-1986
PDRB JAWA BARAT 1983-1986
PDRB JAWA TENGAH 1983-1986
PDRB YOGYAKARTA 1983-1986
PDRB JAWA TIMUR 1980-1985

Table 2.2.10 GRDP Per Capita by Region in Indonesia

Unit: Rp. 1975 Constant Price
Index (Indonesia = 100)

Region	1976		1980		1985	
	Value	Index	Value	Index	Value	Index
Sumatra	159,363	159.4	183,120	149.9	*	*
Java	78,449	78.5	101,640	83.2	137,595	92.1
DKI Jakarta	214,836	214.9	256,559	210	385,377	253.1
West Java	81,259	81.3	95,939	78.5	125,787	84.2
Other Provinces	63,477	63.5	86,794	71	111,592	74.7
Other Islands	118,136	118.2	128,006	104.8	*	*
Indonesia	99,982	100.0	122,160	100.0	149,322	100.0

Region	Annual Growth Rate		
	1976/1980	1980/1985	1976/1985
Sumatra	3.5%	*	*
Java	6.7%	6.2%	6.4%
DKI Jakarta	4.5%	8.5%	6.7%
West Java	4.2%	5.6%	5.0%
Other Provinces	8.1%	5.2%	6.5%
Other Islands	2.0%	*	*
Indonesia	5.1	4.1	4.6

Source: As Table 2.8 plus
Statistik Indonesia 1982,
Antar Sensus Penduduk 1976, 1985
Sensus Penduduk 1980

Table 2.2.11 GRDP Composition and Growth by Industrial Sector

Unit: Rp. Billion, 1975 Constant Price

Region	Industrial Sector	Value						Annual Growth Rate	
		1979		1982		1984		1979/1982	1982/1984
Sumatra	I	1086.8	22.6%	1266.2	22.9%	1479	25.0%	5.2	8.1
	II	2512.1	52.2%	2720.1	49.2%	2610.9	44.1%	2.7	2
	III	1214.4	25.2%	1544.6	27.9%	1826.4	30.9%	8.3	8.7
	Total	4813.3	100.0%	5530.9	100.0%	5916.3	100.0%	4.7	3.4
Java	I	2431.1	29.4%	2797	25.3%	3187.3	24.3%	4.8	6.7
	II	1633.6	19.7%	2477	22.4%	2983.3	22.8%	14.9	9.7
	III	4210	50.9%	5769.7	52.2%	6930	52.9%	11.1	9.6
	Total	8274.7	100.0%	11043.7	100.0%	13100.6	100.0%	10.1	8.9
DKI Jakarta	I	26.4	1.7%	28.7	1.3%	30.1	1.0%	2.8	2.4
	II	379.8	24.9%	563.6	25.4%	748.4	25.7%	14.1	15.2
	III	1120.7	73.4%	1629.7	73.3%	2137.2	73.3%	13.3	14.5
	Total	1526.9	100.0%	2222	100.0%	2915.7	100.0%	13.3	14.6
West Java	I	704.3	29.8%	854.4	27.5%	948.1	25.9%	6.6	5.3
	II	602.7	25.5%	888.1	28.6%	1042	28.5%	13.8	8.3
	III	1057.5	44.7%	1366.6	44.0%	1664.2	45.5%	8.9	10.4
	Total	2364.5	100.0%	3109.1	100.0%	3654.3	100.0%	9.6	8.4
Other Provinces	I	1700.4	38.8%	1913.9	33.5%	2209.1	33.8%	4	7.4
in Java	II	651.1	14.9%	1025.3	17.9%	1192.9	18.3%	16.3	7.9
	III	2031.8	46.4%	2773.4	48.5%	3128.6	47.9%	10.9	6.2
	Total	4383.3	100.0%	5712.6	100.0%	6530.6	100.0%	9.2	6.9
Other Islands	I	1085.3	32.2%	1216.1	31.2%	1312	26.6%	3.9	3.9
	II	1142.6	33.9%	1131.3	29.1%	1907	38.6%	-.3	29.8
	II	1145	33.9%	1544.7	39.7%	1718.2	34.8%	10.5	5.5
	Total	3372.9	100.0%	3892.1	100.0%	4937.2	100.0%	4.9	12.6
Indonesia	I	4603.2	28.0%	5279.3	25.8%	5978.3	25.0%	4.7	6.4
	II	5288.3	32.1%	6328.4	30.9%	7501.2	31.3%	6.2	8.9
	III	6569.4	39.9%	8859.1	43.3%	10474.6	43.7%	10.5	8.3
	Total	16460.9	100.0%	20466.8	100.0%	23954.1	100.0%	7.5	8.2

Source: Pendapatan Regional Propinsi-Propinsi di Indonesia 1979-1984

Note: Sector I includes Agriculture
Sector II includes Mining/Quarry, Manufacturing, Electricity/Gas/Water and Construction
Sector III includes Trade/Hotel/Restaurant, Transportation/Communication, Finance/Banking/Insurance, Government and other services

2.2.5 Vehicle Ownership

The project study concerns itself with vehicle ownership only under three types of vehicles, passenger cars, buses and trucks, because the main study aspect is related to inter-city transportation.

1) Recent Trends in Vehicle Ownership

The number of registered vehicles (except for motor cycles) in Indonesia grew from approximately 1,580,000 vehicles in 1982 to 2,480,000 vehicles in 1988, which gives an annual growth rate of 7.7% from 1982 to 1988. The annual growth rate of buses over the years 1982-88 is very high at 15.0%, whilst for the same period the growth rate for passenger cars is 7.1% per year and for trucks is 6.8% per year, refer to Table 2.2.12.

Java has the largest amount of vehicle registrations, accounting for 76.1%, 65.0% and 61.6% of 1986 registrations for passenger cars, buses and trucks respectively throughout Indonesia. Particularly, for passenger cars, Java has the highest percentage of cars at over 75% of the total. However, Java's ratio of vehicle growth from 1982 to 1986 is the lowest ratio in Indonesia (refer to Table 2.2.13).

The ratio of registered vehicles to population is shown in Table 2.2.14 and it is clearly seen that DKI Jakarta completely dominates the ratios for every type of vehicle by very considerable amounts.

In 1986 DKI Jakarta had 43.6 passenger cars per 1,000 persons, 13.6 buses per 1,000 persons and 18.9 trucks per 1,000 persons (refer to Table 2.2.14).

The composite DKI Jakarta total is 75.9 vehicles/1,000 persons and this figure exceeds West Java 10.7 vehicles/1,000 person by a factor of almost seven.

2) Vehicle Ownership and Prosperity

Fig. 2.2.7 shows the relationship between vehicle ownership and GRDP per capita. It can be seen that in general, vehicle ownership increased as the GRDP per capita increased. This is particularly so in Java (less DKI Jakarta) where ownership of

Table 2.2.12 Historic Pattern, Vehicles Registrations - Indonesia

Type of Vehicles	Year			
	1982	1983	1984	1985
Passenger Cars	791,019	862,424	926,994	990,651
	50.0%	49.5%	48.5%	48.0%
Buses	134,430	160,260	191,654	227,304
	17.0%	18.6%	20.7%	22.9%
Trucks	657,104	717,873	790,881	845,338
	41.5%	41.2%	41.4%	41.0%
Total	1,582,553	1,740,557	1,909,529	2,063,293

Type of Vehicles	Year			Growth Rate 1988/1982[1)]
	1986	1987	1988	
Passenger Cars	1,063,959	1,170,103	1,191,231	1.51
	48.3%	48.2%	48.1%	
Buses	256,574	303,378	310,574	2.31
	24.1%	25.9%	26.1%	
Trucks	882,331	953,694	973,704	1.48
	40.1%	39.3%	39.3%	
Total	2,202,864	2,427,175	2,475,509	1.56

Source: Indonesia State Police

Note: 1) The growth ratio is quoted as the increase multiplication factor applied to the 1982 figures.

Table 2.2.13 Number of Registrated Vehicles - Indonesia

Type of Vehicle	Region	Year					Percent of Total in 1986	Growth Ratio 1986/1982[1)]
		1982	1983	1984	1985	1986		
Passenger Cars	Sumatra	95,401	109,971	117,593	127,866	142,278	13.4%	1.49
	Java	616,229	665,354	713,484	756,768	809,258	76.1%	1.31
	Sulawesi	31,743	33,445	37,690	41,818	46,530	4.4%	1.47
	Kalimantan	22,909	24,697	26,315	29,527	30,432	2.9%	1.33
	Others	24,737	28,957	32,066	33,179	35,461	3.3%	1.43
	Indonesia	791,019	862,424	927,148	989,158	1,063,959	100.0%	1.35
Buses	Sumatra	31,417	36,290	42,128	49,835	54,986	21.4%	1.75
	Java	82,465	100,895	124,152	147,087	166,780	65.0%	2.02
	Sulawesi	7,991	8,781	10,122	13,452	15,983	6.2%	2.00
	Kalimantan	6,284	6,972	7,445	8,150	8,852	3.5%	1.41
	Others	6,273	7,322	7,807	8,780	9,973	3.9%	1.59
	Indonesia	134,430	160,260	191,654	227,304	256,574	100.0%	1.91
Trucks	Sumatra	143,127	158,577	171,707	182,246	189,793	21.5%	1.33
	Java	412,995	444,985	495,307	523,783	543,896	61.6%	1.32
	Sulawesi	46,551	51,485	57,188	62,529	67,221	7.6%	1.44
	Kalimantan	23,301	26,181	28,320	37,602	38,142	4.3%	1.64
	Others	31,130	36,645	38,359	39,178	43,279	4.9%	1.39
	Indonesia	657,104	717,873	790,881	845,338	882,331	100.0%	1.34
Total	Sumatra	269,945	304,838	331,428	359,947	387,057	17.6%	1.43
	Java	1,111,689	1,211,234	1,332,943	1,427,638	1,519,934	69.0%	1.37
	Sulawesi	86,285	93,711	105,000	117,799	129,734	5.9%	1.50
	Kalimantan	52,494	57,850	62,080	75,279	77,426	3.5%	1.47
	Others	62,140	72,924	78,232	81,137	88,713	4.0%	1.43
	Indonesia	1,582,553	1,740,557	1,909,683	2,061,800	2,202,864	100.0%	1.39

Source: Statistical Year Book of Indonesia

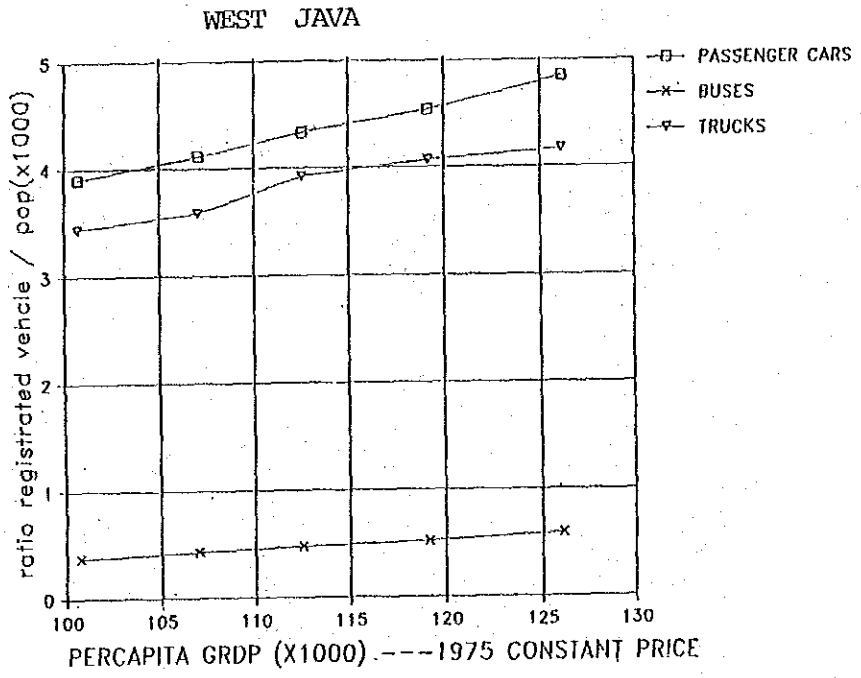
Note: 1) The growth ratio is expressed as the increase multiplication factor applied to the 1982 figures.

Table 2.2.14 Motorization Ratio of Registrated Vehicles

Unit: Veh./1,000 pers.

Type of Vehicle	Region	Year				
		1982	1983	1984	1985	1986
Passenger Cars	DKI Jakarta	39.17	40.98	42.42	43.14	43.46
	West Java	4.96	5.12	5.06	5.19	5.36
	Central Java	2.89	2.87	2.87	3.09	3.29
	East Java	3.85	4.33	5.01	5.25	5.81
	Java	6.51	6.91	7.28	7.58	7.96
	Indonesia	5.49	5.49	5.77	6.03	6.35
Buses	DKI Jakarta	7.09	8.56	10.68	12.57	13.56
	West Java	.59	.67	.76	.84	.91
	Central Java	.33	.41	.44	.48	.51
	East Java	.21	.22	.23	.25	.36
	Java	.87	1.05	1.27	1.47	1.64
	Indonesia	.87	1.02	1.19	1.39	1.53
Trucks	DKI Jakarta	16.02	17.38	18.53	19.00	18.85
	West Java	4.04	3.98	4.27	4.45	4.44
	Central Java	3.17	3.24	3.24	3.30	3.45
	East Java	3.11	3.51	4.23	4.42	4.58
	Java	4.37	4.62	5.05	5.25	5.35
	Indonesia	4.27	4.57	4.93	5.15	5.26
Total	DKI Jakarta	62.28	66.92	71.63	74.70	75.88
	West Java	9.58	9.77	10.09	10.48	10.72
	Central Java	6.38	6.52	6.50	6.87	7.28
	East Java	7.16	8.06	9.48	9.92	10.75
	Java	11.75	12.58	13.59	14.30	14.95
	Indonesia	10.28	11.07	11.89	12.57	13.14

Source: Statistical Yearbook of Indonesia



Note: Data does not inclide DKI Jakarta

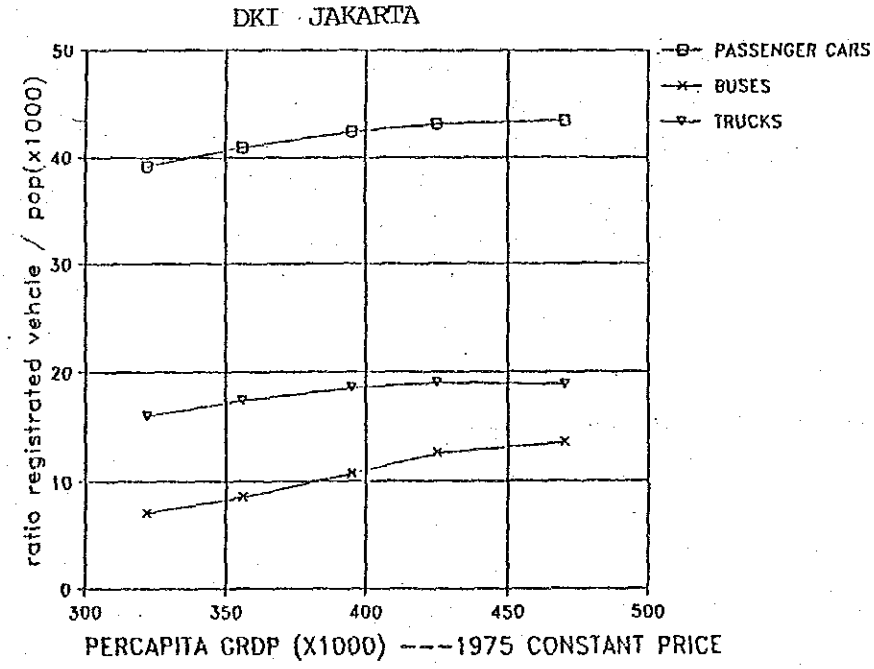


Fig. 2.2.7 Vehicle Ownership and GRDP per Capita

passenger cars shows an extremely upwards path trend. By contrast, in DKI Jakarta the trend is virtually following an almost level path.

2.2.6 Landuse

The landuse of West Java and most Kabupaten's in the study area is still dominated by agricultural areas (refer to Tables 2.2.15 to 2.2.18 and Fig. 2.2.8). The proportion of agricultural area within the study area exceeded 50% in 1987.

In the north and east part of the study area, paddy field occupation is very high. Especially in zone numbers 25, 29 and 30 where it exceeds 75%. The southern area has been fairly recently put under irrigation. In the western part, orchard and plantation occupation is high and in zone numbers 8, 9, 10, 13, 14 and 15 it exceeds 30%.

In the southern part, forest covers a high percentage of the area. In the central parts of the study area paddy fields and forest areas collectively have a high occupation rate. Settlement occupation in the east section is higher than other parts of the study area. Industrial occupation within the study area is very low.

Table 2.2.15 Landuse in West Java

WEST JAVA UNIT: HA

Kabupaten/ Kotamadya	Settlement	Paddy field	Farm	Orchard Plantation	Green Open space	Industry	Forest	Others	Total
Kab. Bandung	42,751	76,445	19,956	81,190	2,072	2,196	73,330	19,899	317,839
Kab. Bekasi	16,023	75,368	3,688	23,453	694	1,425	3,071	24,715	148,437
Kab. Bogor	47,592	73,754	21,128	121,953	4,436	2,737	68,647	3,825	344,072
Kab. Ciamis	29,061	50,001	4,597	114,469	0	89	36,504	20,954	255,675
Kab. Cianjur	17,060	59,965	68,163	70,679	4,528	0	63,092	59,809	343,296
Kab. Cirebon	13,805	62,773	3,115	10,107	1,076	32	2,357	5,561	98,826
Kab. Garut	8,239	44,243	38,696	88,669	11,160	14	109,760	5,738	306,519
Kab. Indramayu	19,467	120,413	2,718	5,858	7,944	0	31,799	11,900	200,099
Kab. Karawang	15,481	103,654	2,403	22,209	1,696	346	13,850	14,114	173,753
Kab. Kuningan	8,744	30,548	31,172	3,702	1,702	0	36,872	5,118	117,858
Kab. Lebak	5,767	34,496	39,500	101,093	1,298	0	95,529	8,313	285,996
Kab. Majalengka*	7,671	46,632	11,625	15,913	1,176	0	18,250	2,130	103,397
Kab. Pandeglang	4,734	48,363	11,639	68,995	4,912	37	125,785	10,225	274,690
Kab. Purwakarta	2,377	17,164	2,730	38,910	1,377	56	23,363	11,005	96,982
Kab. Serang	20,280	64,380	42,780	44,205	0	3,467	4,390	9,214	188,716
Kab. Subang	15,973	86,122	578	65,799	0	165	24,036	12,503	205,176
Kab. Sukabumi	8,641	49,403	25,095	122,143	5,401	64	95,290	87,411	393,448
Kab. Sumedang	8,138	34,738	13,475	37,064	0	1	46,279	12,526	152,221
Kab. Tangerang	29,796	54,311	7,821	23,787	0	4,351	602	7,513	128,181
Kab. Tasikmalaya	17,669	50,899	31,502	112,045	4,053	141	41,835	9,904	268,048
Kodya Bandung	5,740	787	290	0	0	371	0	910	8,098
Kodya Bogor	1,333	7	471	0	0	34	0	312	2,157
Kodya Cirebon	1,593	816	862	0	0	64	0	401	3,736
Kodya Sukabumi	622	412	25	0	0	17	0	139	1,215
Total	348557	1185694	384,029	1172243	53525	15607	914641	344139	4418435

Note :* EXCLUDING Pwk.
Source: LUAS WILAYAH PROPINSI DAERAH TINGKAT I JAWA BALAT dan PENGGUNAAN TANAHNYA ,1987

Table 2.2.16 Proportion of Landuse in West Java

WEST JAVA

Kabupaten/ Kotamadya	Settlement	Paddy Field	Farm	Orchard Plantation	Green Open space	Industry	Forest	Others	Total
Kab. Bandung	13.5%	24.1%	6.3%	25.5%	.7%	.7%	23.1%	6.3%	100.0%
Kab. Bekasi	10.8%	50.8%	2.5%	15.8%	.5%	1.0%	2.1%	16.7%	100.0%
Kab. Bogor	13.8%	21.4%	6.1%	35.4%	1.3%	.8%	20.0%	1.1%	100.0%
Kab. Ciamis	11.4%	19.6%	1.8%	44.8%	.0%	.0%	14.3%	8.2%	100.0%
Kab. Cianjur	5.0%	17.5%	19.9%	20.6%	1.3%	.0%	18.4%	17.4%	100.0%
Kab. Cirebon	14.0%	63.5%	3.2%	10.2%	1.1%	.0%	2.4%	5.6%	100.0%
Kab. Garut	2.7%	14.4%	12.6%	28.9%	3.6%	.0%	35.8%	1.9%	100.0%
Kab. Indramayu	9.7%	60.2%	1.4%	2.9%	4.0%	.0%	15.9%	5.9%	100.0%
Kab. Karawang	8.9%	59.7%	1.4%	12.8%	1.0%	.2%	8.0%	8.1%	100.0%
Kab. Kuningan	7.4%	25.9%	26.4%	3.1%	1.4%	.0%	31.3%	4.3%	100.0%
Kab. Lebak	2.0%	12.1%	13.8%	35.3%	.5%	.0%	33.4%	2.9%	100.0%
Kab. Majalengka*	7.4%	45.1%	11.2%	15.4%	1.1%	.0%	17.7%	2.1%	100.0%
Kab. Pandeglang	1.7%	17.6%	4.2%	25.1%	1.8%	.0%	45.8%	3.7%	100.0%
Kab. Purwakarta	2.5%	17.7%	2.8%	40.1%	1.4%	.1%	24.1%	11.3%	100.0%
Kab. Serang	10.7%	34.1%	22.7%	23.4%	.0%	1.8%	2.3%	4.9%	100.0%
Kab. Subang	7.8%	42.0%	.3%	32.1%	.0%	.1%	11.7%	6.1%	100.0%
Kab. Sukabumi	2.2%	12.6%	6.4%	31.0%	1.4%	.0%	24.2%	22.2%	100.0%
Kab. Sumedang	5.3%	22.8%	8.9%	24.3%	.0%	.0%	30.4%	8.2%	100.0%
Kab. Tangerang	23.2%	42.4%	6.1%	18.6%	.0%	3.4%	.5%	5.9%	100.0%
Kab. Tasikmalaya	6.6%	19.0%	11.8%	41.8%	1.5%	.1%	15.6%	3.7%	100.0%
Kodya Bandung	70.9%	9.7%	3.6%	.0%	.0%	4.6%	.0%	11.2%	100.0%
Kodya Bogor	61.8%	.3%	21.8%	.0%	.0%	1.6%	.0%	14.5%	100.0%
Kodya Cirebon	42.6%	21.8%	23.1%	.0%	.0%	1.7%	.0%	10.7%	100.0%
Kodya Sukabumi	51.2%	33.9%	2.1%	.0%	.0%	1.4%	.0%	11.4%	100.0%
Total	7.9%	26.8%	8.7%	26.5%	1.2%	.4%	20.7%	7.8%	100.0%

Note :* EXCLUDING Pwk.
Source:" LUAS WILAYAH PROPINSI DAERAH TINGKAT I JAWA BALAT dan PENGGUNAAN TANAHNYA" in 1987

Table 2.2.17 Landuse in Study Area

UNIT: HA

	Zone Number	Settlement	Paddy Field	Farm	Orchard Plantation	Green Open space	Industry	Forest	Others	Total
	8	140	3,038	295	7,825	186	0	4,074	174	15,732
	9	1,099	5,118	620	12,872	580	38	9,045	9,939	39,311
	10	1,138	9,008	1,815	18,213	611	18	10,244	892	41,939
	11	3,625	23,927	130	14,404	0	45	5,215	3,066	50,412
	12	5,413	42,258	203	11,933	0	50	250	4,953	65,060
	13	1,456	3,769	40	13,710	0	12	2,233	977	22,197
	14	1,915	8,355	56	8,336	0	35	3,102	2,000	23,799
	15	3,564	7,813	149	17,416	0	23	13,236	1,507	43,708
	21	4,884	17,020	6,760	21,377	0	1	23,917	4,223	78,182
	22	3,254	17,718	6,715	15,687	0	0	22,362	8,303	74,039
	25	2,358	13,674	14	76	12	0	0	455	16,589
	26	2,870	24,780	1,538	980	3,771	0	19,416	2,481	55,836
	27	4,149	24,590	414	293	1,086	0	1,247	6,404	38,183
	28	4,575	23,581	450	1,864	3,058	0	11,136	1,339	46,003
	29	5,515	33,788	302	2,645	17	0	0	1,221	43,488
	30	2,381	22,443	304	95	252	0	0	1,598	27,073
	31	3,843	12,552	1,005	1,702	343	5	1,475	633	21,558
	32	4,098	9,559	1,171	1,730	188	64	0	1,281	18,091
	33	5,077	19,036	1,464	6,578	295	27	883	2,451	35,811
*	34	740	9,483	940	3,173	27	0	5,190	289	19,842
*	35	2,163	11,950	1,377	1,148	35	0	167	335	17,175
*	36	1,237	5,231	237	1,577	192	0	1,588	164	10,226
*	37	3,531	19,968	9,071	10,015	922	0	11,305	1,342	56,154

Note :* EXCLUDING Pwk.
Source: LUAS WILAYAH PROPINSI DAERAH TINGKAT I JAWA BALAT dan PENGGUNAAN TANAHNYA ,1987

Table 2.2.18 Proportion of Landuse in Study Area

	Zone Number	Settlement	Paddy Field	Farm	Orchard Plantation	Green Open space	Industry	Forest	Others	Total
	8	.9%	19.3%	1.9%	49.7%	1.2%	.0%	25.9%	1.1%	100.0%
	9	2.8%	13.0%	1.6%	32.7%	1.5%	.1%	23.0%	25.3%	100.0%
	10	2.7%	21.5%	4.3%	43.4%	1.5%	.0%	24.4%	2.1%	100.0%
	11	7.2%	47.5%	.3%	28.6%	.0%	.1%	10.3%	6.1%	100.0%
	12	8.3%	65.0%	.3%	18.3%	.0%	.1%	.4%	7.6%	100.0%
	13	6.6%	17.0%	.2%	61.8%	.0%	.1%	10.1%	4.4%	100.0%
	14	8.0%	35.1%	.2%	35.0%	.0%	.1%	13.0%	8.4%	100.0%
	15	8.2%	17.9%	.3%	39.8%	.0%	.1%	30.3%	3.4%	100.0%
	21	6.2%	21.8%	8.6%	27.3%	.0%	.0%	30.6%	5.4%	100.0%
	22	4.4%	23.9%	9.1%	21.2%	.0%	.0%	30.2%	11.2%	100.0%
	25	14.2%	82.4%	.1%	.5%	.1%	.0%	.0%	2.7%	100.0%
	26	5.1%	44.4%	2.8%	1.8%	6.8%	.0%	34.8%	4.4%	100.0%
	27	10.9%	64.4%	1.1%	.8%	2.8%	.0%	3.3%	16.8%	100.0%
	28	9.9%	51.3%	1.0%	4.1%	6.6%	.0%	24.2%	2.9%	100.0%
	29	12.7%	77.7%	.7%	6.1%	.0%	.0%	.0%	2.8%	100.0%
	30	8.8%	82.9%	1.1%	.4%	.9%	.0%	.0%	5.9%	100.0%
	31	17.8%	58.2%	4.7%	7.9%	1.6%	.0%	6.8%	2.9%	100.0%
	32	22.7%	52.8%	6.5%	9.6%	1.0%	.4%	.0%	7.1%	100.0%
	33	14.2%	53.2%	4.1%	18.4%	.8%	.1%	2.5%	6.8%	100.0%
*	34	3.7%	47.8%	4.7%	16.0%	.1%	.0%	26.2%	1.5%	100.0%
*	35	12.6%	69.6%	8.0%	6.7%	.2%	.0%	1.0%	2.0%	100.0%
*	36	12.1%	51.2%	2.3%	15.4%	1.9%	.0%	15.5%	1.6%	100.0%
*	37	6.3%	35.6%	16.2%	17.8%	1.6%	.0%	20.1%	2.4%	100.0%

Note :* EXCLUDING Pwk.
Source: LUAS WILAYAH PROPINSI DAERAH TINGKAT I JAWA BALAT dan PENGGUNAAN TANAHNYA ,1987

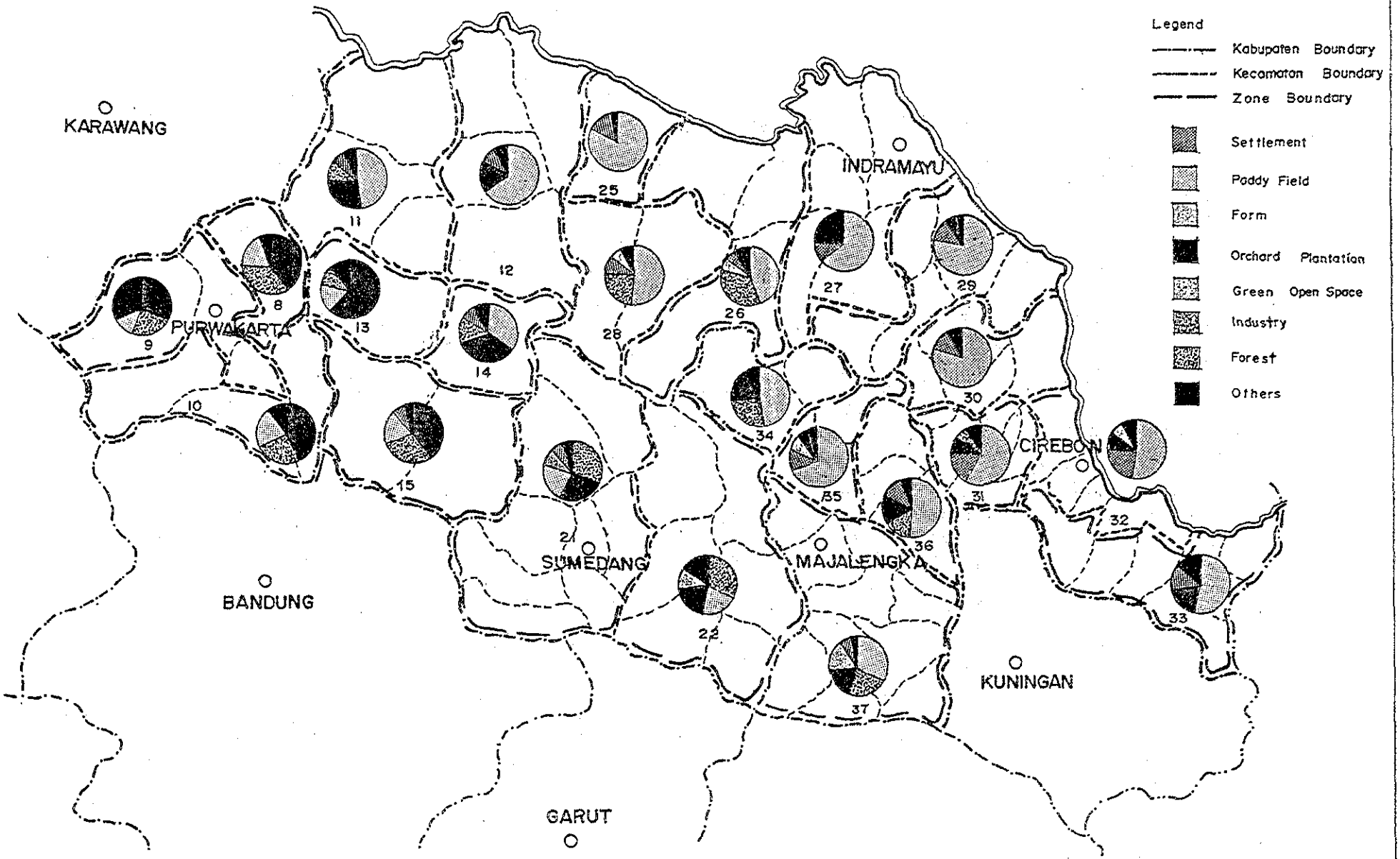


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Fig. 2.2.8 Proportion of Landuse in Study Area

CHAPTER 3. EXISTING TRANSPORTATION PROFILE

CHAPTER 3. EXISTING TRANSPORTATION PROFILE

3.1 Road Network

This report section basically presents the road network conditions within West Java Province and outlines current Indonesian practice for classifying the functional system of the road network. This data has provided background study material regarding the correlation of the planning and design of the tollway to the West Java road network.

3.1.1 Road Conditions

Table 3.1.1 and Fig. 3.1.1 show the present condition of arterial roads in West Java Province.

Table 3.1.1 Distribution of Road Conditions in West Java

Road Condition	Road Status					
	National		Provincial		Total	
	(km)	%	(km)	%	(km)	%
Good	580.2	88.7	589.3	29.7	1,169.5	44.3
Moderate	72.1	11.0	1,368.7	68.9	1,440.8	54.6
Damaged	1.9	0.3	29.2	1.4	31.1	1.1
Total	654.2	100.0	1,987.2	100.0	2,641.4	100.0

Source: "Daftar Kondisi Jalan Pada Akhir Bulan", 1988, Bina Marga

Almost 90% of the national roads in West Java are in good condition, in contrast only some 30% of the provincial roads are in good condition.

Overall, around 44% of arterial roads in West Java are classified as in good condition and of the remainder, some 55% are in moderate condition, whilst only 1% are classified as damaged.

Fig. 3.1.2 shows the width of roads in West Java.

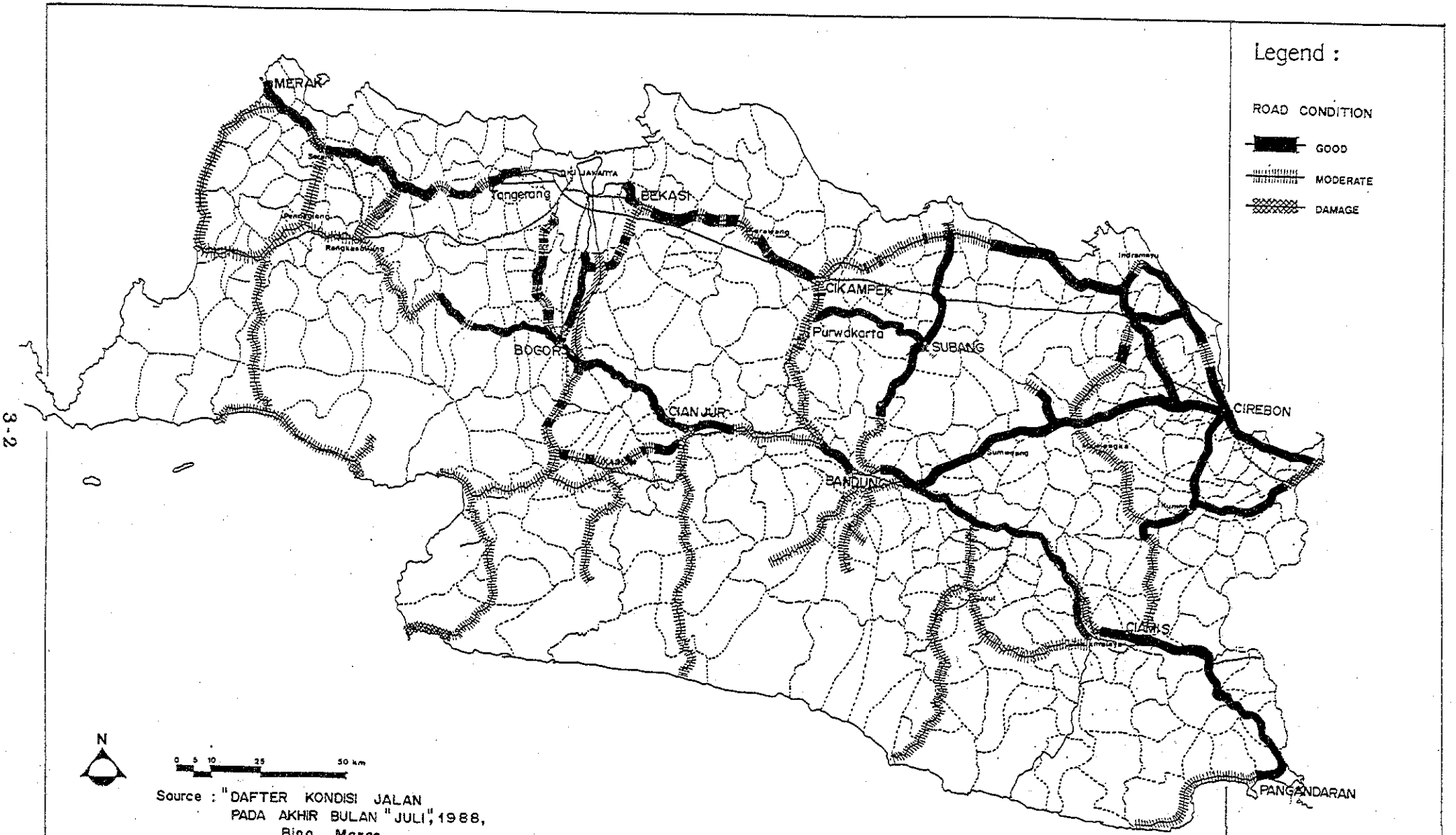

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Fig. 3.1.1 Condition of Roads in West Java

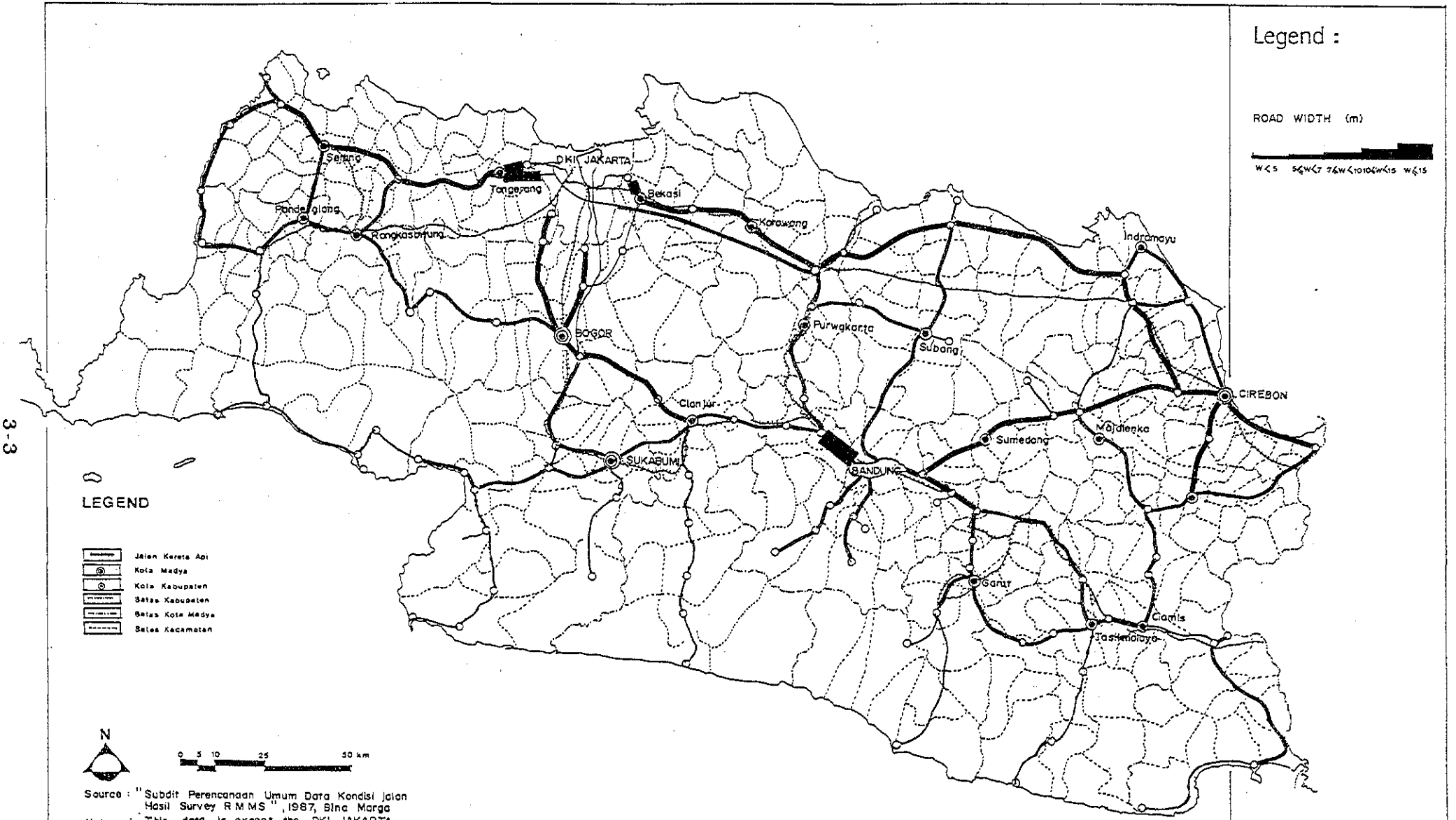

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Fig. 3.1.2 Width of Roads in West Java

The majority of the arterial roads are less than 7 m wide and furthermore most are only of a 2 lane-2 way design. However, over recent years there is a gradual increase in widening arterial roads to a 4 lane-2 way standard.

3.1.2 Primary and Secondary System

In developing a functional system for a road network it is necessary to classify the roads against their respective functions. In Indonesia road functions are divided into two main classifications, a primary system and a secondary system. This classification is done after firstly categorizing roads into two types, i.e. Type I, roads which have direct access through to town centers; and Type II, those roads which do not have direct access.

The primary system supports inter-city traffic movement and the secondary system supports 'intra-city' movement. Within each system the roads are sub-classified into functions as either artery, collector or local roads.

The primary and secondary systems classifications are also used within the strategy for regional development, and they are drawn-up in compliance with design and structure regulations for regional/city planning development.

Table 3.1.2 shows the classification and functions of road types into the primary and secondary systems and their corresponding design criteria standard.

Table 3.1.2 Road Classification and Design Criteria for Primary and Secondary System

Road Type	Function 1	Function 2	Design Traffic Volume (veh/day)	Road Class	Design Speed(km/h)
I	Primary	Artery	-	1	100 (80)
		Collector	-	2	80, 60
	Secondary	Artery	-	2	80, 60
II	Primary	Artery	-	1	60
			> 10,000	1	60
		Collector	< 10,000	2	60, 50
		Artery	> 20,000	1	60
			< 20,000	2	60, 50
	Secondary	Collector	> 60,000	3	40, 30
			< 80,000	3	
		Local	> 500	3	40, 30
			< 500	4	30, 20

3.1.3 Road Network in West Java

The status, function and measurements of the main road network (National and Provincial roads) for West Java are presented in Table 3.1.3.

Fig. 3.1.3 presents the road network layout, with road status and function shown for each road.

The total length of roads (National and Provincial) is about 2,411 km in 1987.

Table 3.1.3 Road Conditions in West Java (1)

ROAD CODE	STATUS	FUNCTION	ROAD NAME	LENGTH (KM)	WIDTH (M)
001	NATIONAL	ARTERY	MERAK - CIREGON	12.2	6.1
002	NATIONAL	ARTERY	CILEGON - SERANG	17.9	7.3
003	NATIONAL	ARTERY	SERANG - TANGERANG	29.7	7
004	NATIONAL	ARTERY	TANGERANG - BATAS DKI JAKARTA	7.0	11.4
005	NATIONAL	ARTERY	BATAS DKI JAKARTA - BEKASI	6.4	13.4
006	NATIONAL	ARTERY	BEKASI - KARAWANG	37.6	7.1
007	NATIONAL	ARTERY	KARAWANG - CIKAMPEK	24.4	7.3
008	NATIONAL	ARTERY	CIKAMPEK - PAMANUKAN	45.4	7
009	NATIONAL	ARTERY	PAMANUKAN - LOH BENER	55.7	7
010	NATIONAL	ARTERY	LOH BENER - JATI BARANG	10.4	7.1
011	NATIONAL	LOCAL	JATI BARANG - KARANG AMPEL	17.7	6.6
012	NATIONAL	COLLECTOR	KARANG AMPEL - CIREBON	28.8	6.3
013	NATIONAL	ARTERY	CIREBON - LOSARI	31.0	8
014	NATIONAL	ARTERY	GANDARIA - BOGOR	26.8	7
015	NATIONAL	ARTERY	BOGOR - CIAWI	5.0	7.6
016	NATIONAL	COLLECTOR	CIAWI - CIANJUR	50.3	8
017	NATIONAL	ARTERY	CIANJUR - PADALARANG	45.0	6.7
018	NATIONAL	ARTERY	PADALARANG - BYPASS - CIDUKU	13.1	24.3
019	NATIONAL	ARTERY	BANDUNG - CILEUNYI	12.1	7.2
020	NATIONAL	ARTERY	CILEUNYI - SUMEDANG	26.2	7
021	NATIONAL	ARTERY	SUMEDANG - CIJELAG	29.2	7.2
022	NATIONAL	ARTERY	CIJELAG - KADIPATEN	4.6	7
023	NATIONAL	ARTERY	KADIPATEN - PALIMANAN	33.9	7
024	NATIONAL	ARTERY	PALIMANAN - CIREBON	13.4	7.1
025	PROVINCIAL	ARTERY	PALIMANAN - JATI BARANG	31.7	7
026	PROVINCIAL	COLLECTOR	CILEGON - LABUAN	59.2	5.6
027	PROVINCIAL	LOCAL	LABUAN - SAKETI	22.8	5.2
028	PROVINCIAL	LOCAL	SAKETI - PANDEGLANG	18.8	5.7
029	PROVINCIAL	COLLECTOR	PANDEGLANG - SERANG	23.1	6
030	PROVINCIAL	COLLECTOR	PANDEGLANG - RANGKAS BITUNG	19.0	5.2
031	PROVINCIAL	COLLECTOR	RANGKAS BITUNG - BOGOR	98.6	5.1
032	PROVINCIAL	LOCAL	SAKETI - SIMPANG	62.1	4.8
033	PROVINCIAL	LOCAL	SIMPANG - MUARA BINUANGEUN	16.8	4
034	PROVINCIAL	LOCAL	SIMPANG - BAYAH	33.7	4.2
035	PROVINCIAL	LOCAL	BAYAH - CIKOTEK	13.4	4.1
036	PROVINCIAL	LOCAL	BAYAH - GUNUNG MADUR	5.5	3.5
037	PROVINCIAL	LOCAL	CISOLOK - BABAGAN	19.3	5.3
038	PROVINCIAL	LOCAL	BABAGAN - UJUNG GENTENG	70.2	4.2
039	PROVINCIAL	LOCAL	BABAGAN - CIKEMBANG	11.5	5.2
040	PROVINCIAL	COLLECTOR	CIKEMBANG - CIBADAK	9.6	4.8
041	PROVINCIAL	LOCAL	CIKEMBANG - SUKABUMI	19.0	5.1
042	PROVINCIAL	ARTERY	CIBADAK - SUKABUMI	15.2	6.2
043	PROVINCIAL	ARTERY	CIAWI - CIBADAK	34.7	6.5
044	PROVINCIAL	COLLECTOR	SUKABUMI - SAGARANTEN	50.9	4.5
045	PROVINCIAL	ARTERY	SUKABUMI - CIANJUR	27.1	6
046	PROVINCIAL	COLLECTOR	CIANJUR - SINDANG BARANG	111.4	4.3
047	PROVINCIAL	COLLECTOR	BANDUNG - RANCABALI	40.3	5.9
048	PROVINCIAL	COLLECTOR	BANDUNG - PANGALENGAN (PINTU)	40.7	5.7
049	PROVINCIAL	ARTERY	CILEUNYI - NAGREG	21.1	7.2
050	PROVINCIAL	COLLECTOR	NAGREG - GARUT	20.4	5.9

Table 3.1.3 Road Conditions in West Java (2)

ROAD CODE	STATUS	FUNCTION	ROAD NAME	LENGTH (KM)	WIDTH (M)
051	PROVINCIAL	COLLECTOR	GARUT - CIKAJANG	23.4	5.6
052	PROVINCIAL	COLLECTOR	CIKAJANG - PAMEUNGPEUK	65.6	4.3
053	KABUPATEN	LOCAL	CIKAJANG - SAMUDRA	12.4	4.7
054	PROVINCIAL	COLLECTOR	GARUT - TASIKMALAYA	50.4	5.4
055	PROVINCIAL	ARTERY	RAJA POLAH - TASIKMALAYA	12.3	6.3
056	PROVINCIAL	ARTERY	NAGRES - RAJA POLAH	51.1	6.3
057	PROVINCIAL	ARTERY	RAJA POLAH - ANCOL	13.6	4.6
058	PROVINCIAL	ARTERY	TASIKMALAYA - ANCOL	3.8	6.8
059	PROVINCIAL	COLLECTOR	TASIKMALAYA - CIPATUJAH	69.5	4.9
060	PROVINCIAL	ARTERY	ANCOL - CIAMIS	12.0	7
061	PROVINCIAL	ARTERY	CIAMIS - BANJAR	23.8	4.5
062	PROVINCIAL	ARTERY	BANJAR - BATAS PROPINSI JAWA TENGAH	5.9	6
063	PROVINCIAL	COLLECTOR	BANJAR - PANGANDARAN	62.2	6.1
064	PROVINCIAL	COLLECTOR	CIAMIS - CIKIJING	48.3	6.1
065	PROVINCIAL	COLLECTOR	CIKIJING - KUNINGAN	22.3	6.6
066	PROVINCIAL	COLLECTOR	KUNINGAN - LOSARI	48.1	5.3
067	PROVINCIAL	COLLECTOR	KUNINGAN - CIREBON	23.5	7.1
068	PROVINCIAL	LOCAL	CIKIJING - MAJALENGKA	32.8	5.5
069	PROVINCIAL	COLLECTOR	KADIPATEN - MAJALENGKA	13.6	6.7
070	PROVINCIAL	LOCAL	KADIPATEN - JATIBARANG	42.2	4.9
071	PROVINCIAL	COLLECTOR	BOGOR - CIPUTAT	36.5	7
072	PROVINCIAL	COLLECTOR	LOHBENER - INDRAMAYU	9.7	6.7
073	PROVINCIAL	COLLECTOR	INDRAMAYU - KARANG AMPEL	24.1	6.5
074	PROVINCIAL	LOCAL	CIJELANG - CIKAMURANG	21.2	4
075	PROVINCIAL	COLLECTOR	BANDUNG - SUBANG	46.5	5.8
076	PROVINCIAL	COLLECTOR	SUBANG - PAMANUKAN	37.3	5.8
077	PROVINCIAL	COLLECTOR	SUBANG - SADANG	42.7	6
078	PROVINCIAL	ARTERY	PADALARANG - PURWAKARTA	47.2	6.3
079	PROVINCIAL	ARTERY	PURWAKARTA - SADANG	3.4	6.1
080	PROVINCIAL	ARTERY	SADANG - CIKAMPEK	13.0	6.2
081	PROVINCIAL	LOCAL	PANGANDARAN - KALAPAGENEP	51.0	4.5
082	PROVINCIAL	COLLECTOR	RANGKASBITUNG - CIKANDEK	27.8	5.7
084	KABUPATEN	LOCAL	CIMAUNG - MALABAR	11.0	6
085	TOLLWAY	ARTERY	JAKARTA - CIKAMPEK	27.3	6.3
086	TOLLWAY	ARTERY	JAKARTA - TANGERANG	17.9	11
087	KABUPATEN	COLLECTOR	CIKOTOK - CIBOLOK	8.1	3.3
088	KABUPATEN	LOCAL	SUBANG - CIBEO	1.6	4
090	KABUPATEN	LOCAL	WARUNG KALDE - RANCAEKEK	2.5	4.1
TOTAL				2,410.9	

Source : "Subdit Perencanaan Umum Data Kondisini
jalan Hasil Survey RMMS",1987, BINA MARGA

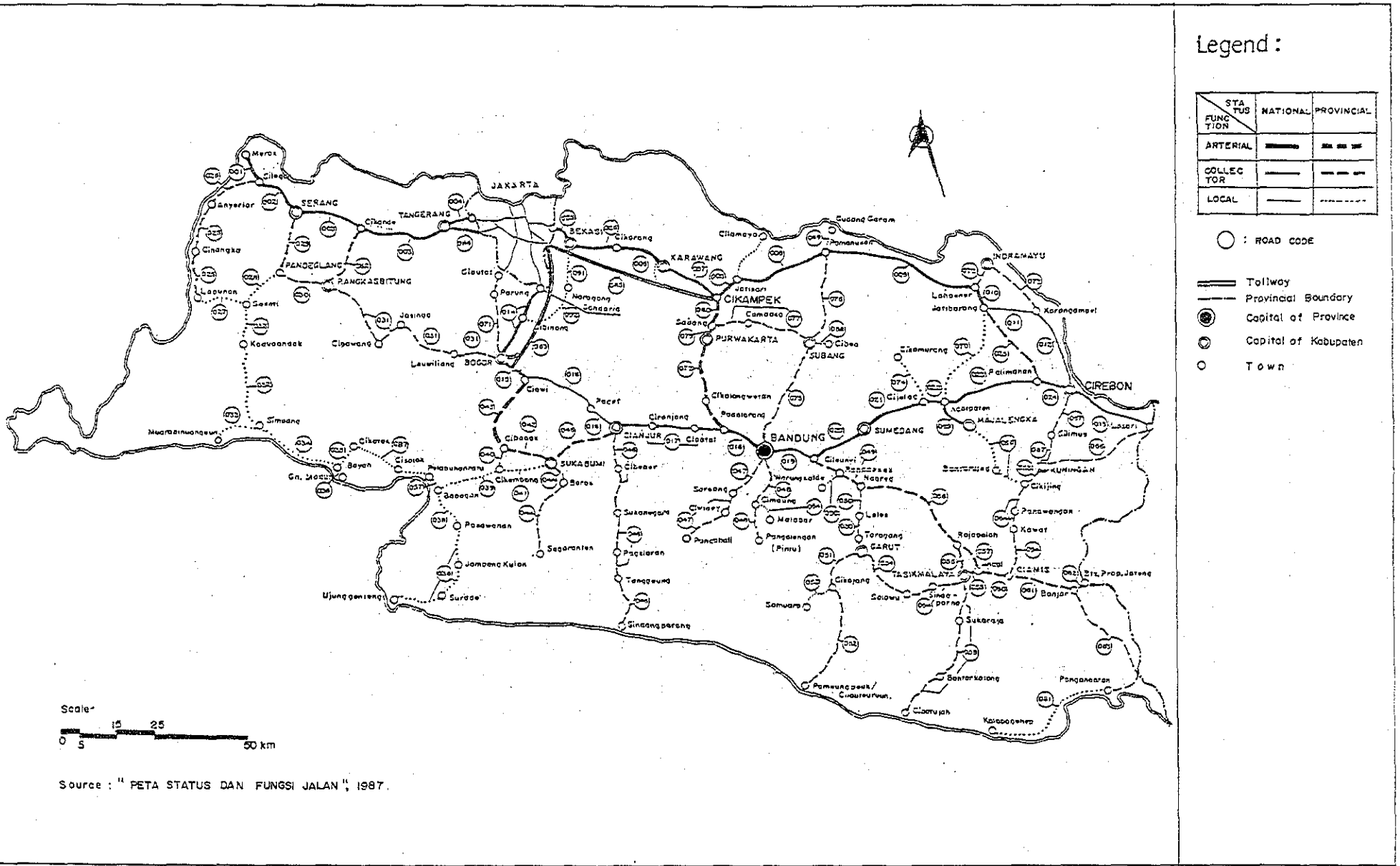

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Fig. 3.1.3 Road Functional Classification in West Java

3.2 Inter-City Bus Transportation

3.2.1 Vehicle Ownership and Operation

The number of inter-city buses and the operating companies in Java and Bali are 5009 and 343 respectively in 1987 as shown in Tables 3.2.1 and 3.2.2. These numbers are not largely changed since 1984.

Table 3.2.1 Number of Inter-City Bus Companies in Java and Bali

Name of Province	1983	1984	1985	1986	1987
DKI Jakarta	51	63	63	56	58
West Java	109	123	123	126	123
Central Java	90	102	102	91	90
Yogyakarta	12	13	13	14	14
East Java	37	44	44	42	45
Bali	12	18	12	12	13
Total Java and Bali	311	363	357	341	343

Source: LLAJR

Table 3.2.2 Numbers of Inter-City Bus Vehicles in Java and Bali

		1983	Growth	1984	Growth	1985	Growth	1986	Growth	1987
DKI Jakarta	Bus	909	(21.5%)	1,104	(.0%)	1,104	(-6.8%)	1,029	(-.9%)	1,020
	Trip/day	2,231	(-4.8%)	2,124	(.0%)	2,124	(28.1%)	2,721	(-14.4%)	2,328
West Java	Bus	2,036	(7.0%)	2,178	(.0%)	2,178	(7.1%)	2,333	(.0%)	2,334
	Trip/day	4,174	(3.9%)	4,338	(.0%)	4,338	(13.9%)	4,941	(4.5%)	5,165
Central Java	Bus	992	(-2.3%)	969	(.0%)	969	(.9%)	978	(-3.9%)	940
	Trip/day	2,006	(-6.9%)	1,867	(.0%)	1,867	(-.5%)	1,857	(-2.4%)	1,812
Yogyakarta	Bus	112	(-22.3%)	87	(.0%)	87	(24.1%)	108	(-.9%)	107
	Trip/day	366	(-18.0%)	300	(.0%)	300	(8.7%)	326	(.6%)	328
East Java	Bus	531	(-6.2%)	498	(.0%)	498	(-4.4%)	476	(17.2%)	558
	Trip/day	731	(17.4%)	858	(.0%)	858	(-7.0%)	798	(19.0%)	950
Bali	Bus	47	(31.9%)	62	(-22.6%)	48	(.0%)	48	(4.2%)	50
	Trip/day	49	(46.9%)	72	(-19.4%)	58	(.0%)	58	(-10.3%)	52
Total Java and Bali	Bus	4,627	(5.9%)	4,898	(-.3%)	4,884	(1.8%)	4,972	(.7%)	5,009
	Trip/day	9,557	(.0%)	9,559	(-.1%)	9,545	(12.1%)	10,701	(-.6%)	10,635

Source: LLAJR

West Java has the highest number of inter-city bus companies (123) and vehicles (2,334), that is, 36% of total companies and 47% of total vehicles in 1987.

West Java and DKI Jakarta are almost equal in having the highest ratio of vehicle ownership by company, at a range between 17.5 to 19.0 vehicle/company (years 1983 to 87).

3.2.2 Inter-City Bus Operation

The available data for inter-city bus operation was produced by LLAJR (Directorate of Road Traffic and Transport) in April 1988.

DKI Jakarta and surroundings generate the most trips within Java island due the concentration of population and economic activity. The number of trips generated in Jabotabek area for the year 1988 was 5,270 trips. The distribution of trip generation related to the terminal cities in West Java are shown in Table 3.2.3 and Fig. 3.2.1.

Table 3.2.3 Summary of Inter-City Bus Trip Distribution by Region in 1988

Origin	Destination										
	Banten	Jabotabek	Purwasuka	Cirebon	Sukabumi	Bandung Raya	Priangan Timur	Central Java	East Java & Bali	Sumatra	Total
Banten	0	347	26	41	0	45	13	49	5	0	526
Jabotabek	347	2,841	133	358	264	432	228	582	66	19	5,270
Purwasuka	26	133	0	0	0	0	0	0	0	0	159
Cirebon	41	358	0	0	0	0	0	78	2	0	399
Sukabumi	0	264	0	0	0	0	0	6	0	0	270
Bandung Raya	58	552	0	0	0	0	0	129	16	0	755
Priangan Timur	0	108	0	0	0	0	0	71	2	0	181
Central Java + Yogyakarta	49	582	0	78	6	129	71	1,470	593	14	2,992
East Java & Bali	5	66	0	2	0	16	2	593	196	6	886
Sumatra	0	19	0	0	0	0	0	14	6	0	39
Total	526	5,270	159	477	270	622	314	2,992	886	39	11,477

Source: LLAJR Inter-City Bus Data

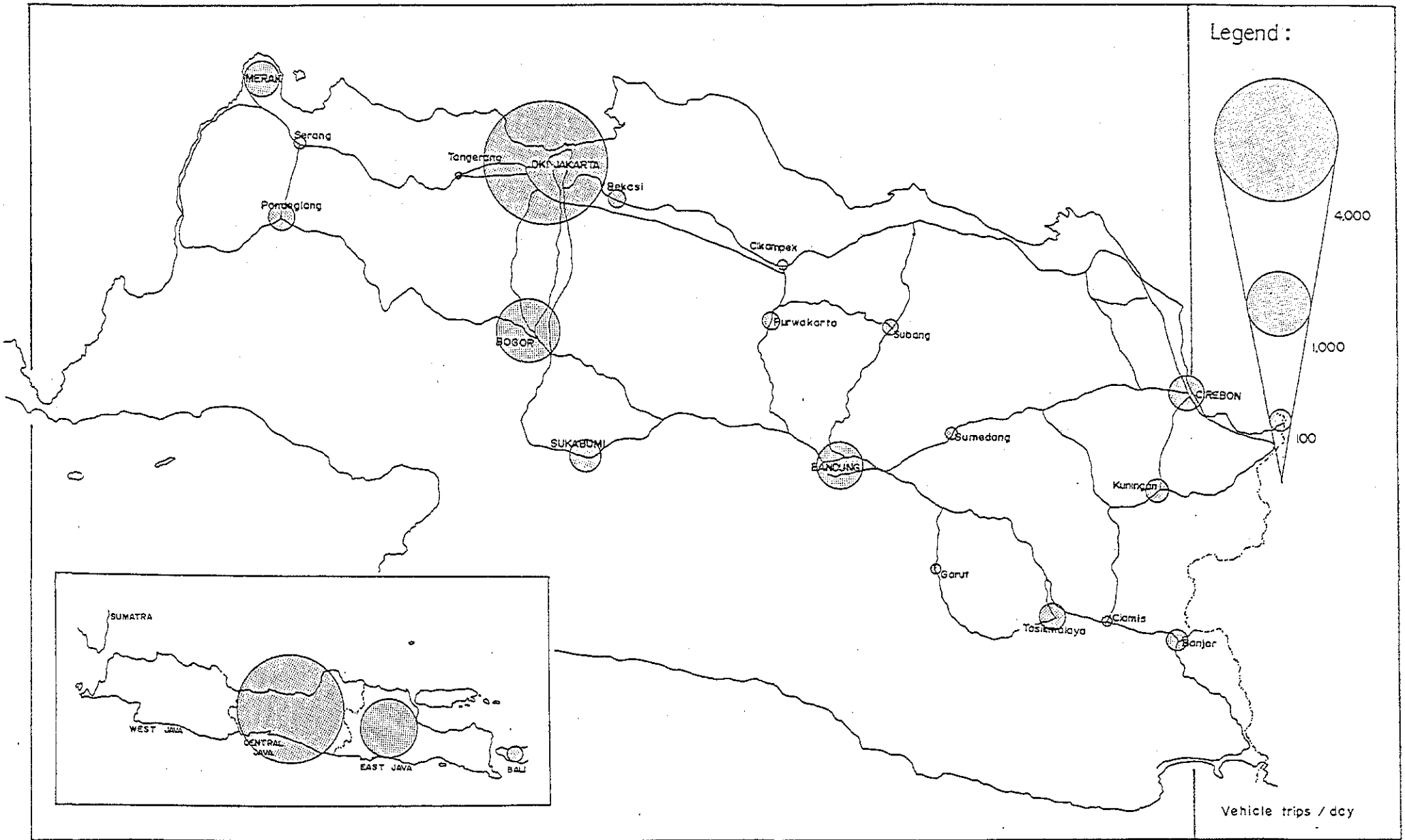

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Fig. 3.2.1 Trip Generation of Inter-City Buses

The total trips generated by inter-city bus in Java island for the year 1988 was 11,477 per day, distributed as 4,167 in DKI Jakarta, 3,393 in West Java, 1,256 in Central Java, 1,736 in Yogyakarta and 825 in East Java. The number of trips generated in Sumatra and Bali related with travel to the terminal cities in Java are 39 and 61 trips per day respectively.

The most generated terminal cities in the West Java province, excluding Botabek area, are:

a) Merak (Banten), Pandeglang (Banten) and Cirebon (Cirebon) in the northern area, and

b) Sukabumi, Bandung (Bandung Raya), Tasikmalaya (Priangan Timur), Kuningan (Cirebon) and Banjar (Priangan Timur) in the southern area.

Fig. 3.2.2 diagrammatically shows the desired lines of inter-city bus traffic presented in Table 3.2.3.

Thus, the trip distribution pattern by each sub-region could be summarized as follows:

a) About 54% of inter-city bus trips generated in Jabotabek are intra-zonal trips (Jabotabek to Jabotabek).

b) Jabotabek is the main center of the inter-city bus operation system in Java as is shown by the relative percentages of trip distribution to each sub-region in West Java, and other related areas.

c) Inter-city bus trips from Purwasuka sub-region are generated by the terminal cities of Cikampek, Purwakarta and Subang and distribute to Jabotabek and Banten sub-regions only.

d) Most of the inter-city bus trips from Sukabumi distribute to Jabotabek (about 98%).

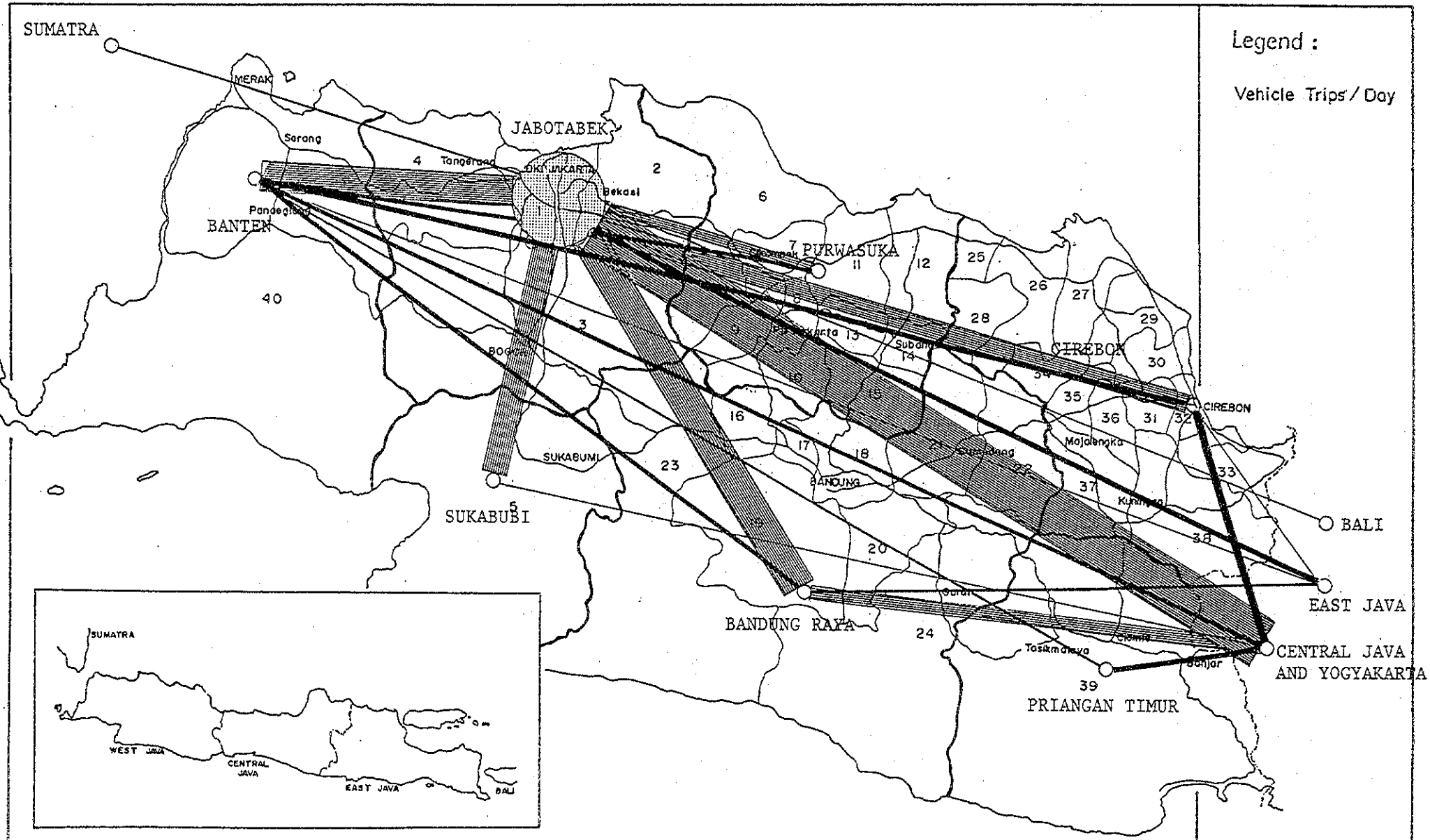

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Fig. 3.2.2 Trip Distribution of Bus Vehicle

e) The sub-regions of Bandung Raya, Cirebon and Priangan Timur have considerable distribution to Central and East Java provinces, and form about 23.3%, 23.7% and 16.0% of each total trips respectively.

f) The generated trips in Central Java distribute to West Java sub-regions more than to East Java (30.8% and 10.1% respectively).

g) Almost half of the total trips from Sumatra distribute to Jabotabek and the others to Central and East Java provinces. About 8% of generated trips in Bali distribute to Jabotabek and the others to Central and East Java.

The available data from LLAJR was further used to estimate the average daily traffic volume within the present road network based on the inter-city bus route and its average trips. Fig. 3.2.3 shows the accumulated daily traffic volume by each bus route within the road network for the year 1988. The traffic volume within the northern traffic corridor in West Java is higher than the southern traffic corridor.

The link between Jakarta and Cikampek has the highest volume (1,312 bus-vehicle trips/day) and is followed by the link between Palimanan and Cirebon (1,211 bus vehicle trips/day). The Jakarta - Cikampek link is used as the major regional gate for trips from the east part of Jakarta.

In the case of the Palimanan - Cirebon link, the volume of traffic relates to the accumulation of traffic from the northern area of West Java to Central and East Java, and also from the southern area of West Java to East Java and the northern area of Central Java.

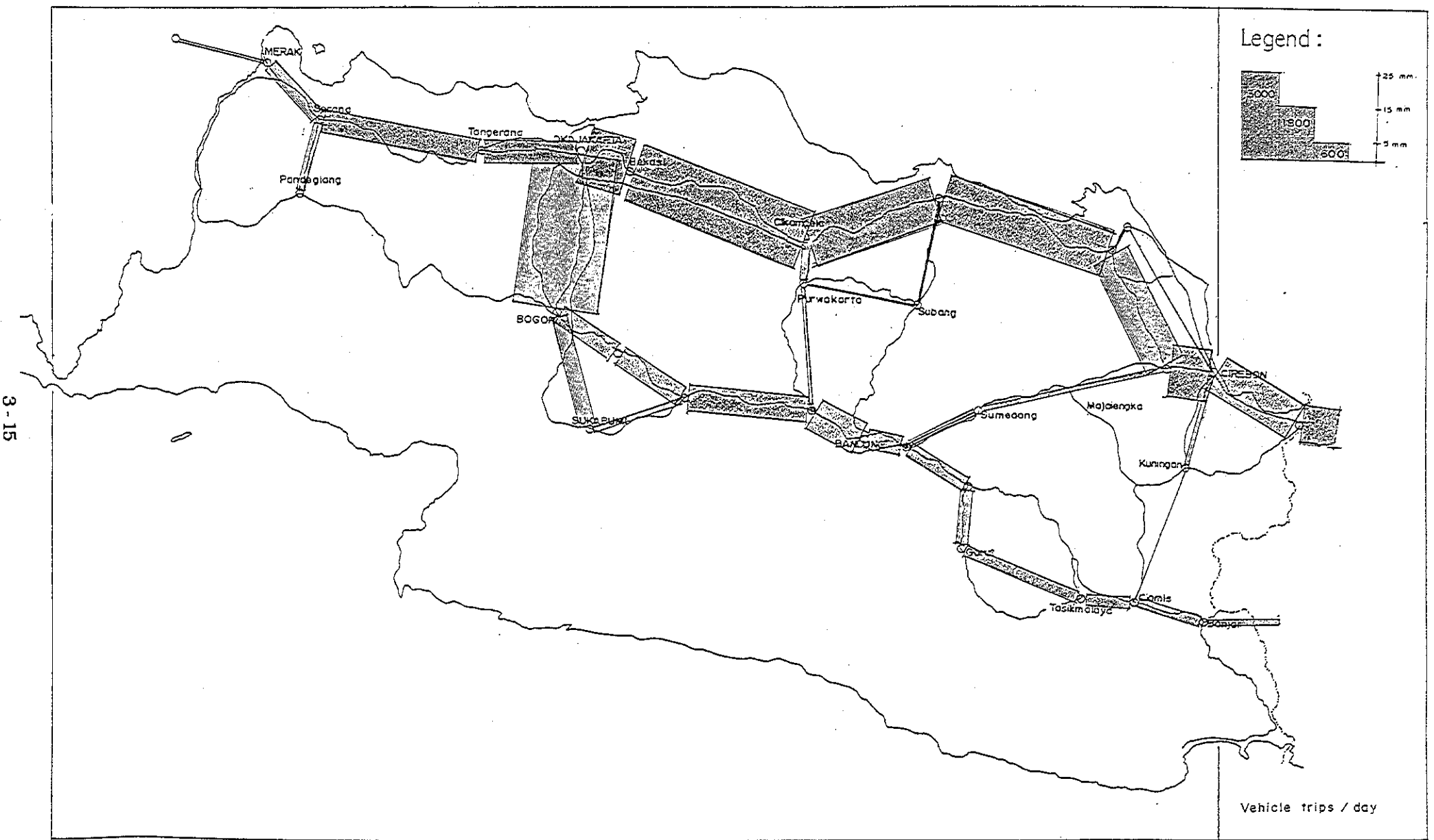

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Fig. 3.2.3 Major Flows of Inter-City Bus Vehicles

3.3 Commercial Truck Transportation

3.3.1 Trucking Companies and Owned Trucks

The number of trucking companies in Java was derived from LLAJR as shown in Table 3.3.1. The number of companies in 1987 was 1,089 which is 3.6 times those in 1983. The companies are concentrated in DKI Jakarta and Central Java, and these areas had 394 companies equally.

The number of commercial trucks, excluding pick-ups, was 8,813 in Java in 1987 and Central Java accounting for about 36%, or 3,179 trucks, of the Java total. This is the highest in number followed by DKI Jakarta's 2,269 trucks as shown in Table 3.3.2.

West Java had 1,253 commercial trucks, which is about half of those in DKI Jakarta and Central Java. The proportion of trailer truck ownership was about 30% of the total trucks which was higher than the Java average of 25%. However, the truck ownership in West Java, except for Yogyokarta, is relatively lower than other provinces in Java Island.

The highest growth of trucks (excluding pick-ups) was in DKI Jakarta at about 29% per annum for years 1983 to 1987. Over the same years West Java and Central Java averaged about 21% and 20% respectively. However it is to be noted that the number of commercial trucks in DKI Jakarta and West Java and East Java actually decreased by around 8 to 11% for the year 1986-87. Central Java province still has the largest numbers of trucks as at 1987.

3.3.2 Truck Traffic

The profile of trip generation by type of truck vehicle in 1983 was derived from the study for Land Transport Development Plan-Phase I (Directorate General of Land Transport and Inland Waterways 1985), which uses Bina Marga count figures.

Table 3.3.3 shows truck trip generation by each urban center. The conclusions of the table analysis of the 1983 data was as follows:

Table 3.3.1 Number of Truck Operating Companies in Java

		1983	1984	1985	1986	1987
DKI JAKARTA	Σ Company	70	100	153	330	394
	Growth (%)		42.9%	53.0%	115.7%	19.4%
WEST JAVA	Σ Company	28	34	65	77	94
	Growth (%)		21.4%	91.2%	18.5%	22.1%
CENTRAL JAVA	Σ Company	105	120	117	268	394
	Growth (%)		14.3%	-2.5%	129.1%	47.0%
YOGYAKARTA	Σ Company	9	12	7	13	15
	Growth (%)		33.3%	-41.7%	85.7%	15.4%
EAST JAVA	Σ Company	91	108	76	147	192
	Growth (%)		18.7%	-29.6%	93.4%	30.6%
TOTAL JAVA	Σ Company	303	374	418	835	1,089
	Growth (%)		23.4%	11.8%	99.8%	30.4%

Source : LLAJR

Table 3.3.2 Number of Truck Vehicles in Java

		1983	GROWTH	1984	GROWTH	1985	GROWTH	1986	GROWTH	1987
DKI JAKARTA	Σ Truck	646	38.7%	896	75.7%	1,574	34.9%	2,123	-15.6%	1,834
	Σ Trailer	171	53.2%	262	14.1%	299	42.1%	425	2.4%	435
	Sub Total	817	41.7%	1,158	61.7%	1,873	36.0%	2,548	-10.9%	2,269
WEST JAVA	Σ Truck	413	-6.1%	388	76.5%	685	36.8%	937	-7.0%	871
	Σ Trailer	180	68.3%	303	9.9%	333	31.5%	438	-12.3%	382
	Sub Total	593	16.5%	691	47.3%	1,018	35.1%	1,375	-8.9%	1,253
CENTRAL JAVA	Σ Truck	1,033	21.6%	1,317	-40.0%	790	181.9%	2,227	7.4%	2,391
	Σ Trailer	454	35.9%	617	-33.2%	412	98.5%	818	-3.7%	788
	Sub Total	1,537	25.8%	1,934	-37.8%	1,202	153.3%	3,045	4.4%	3,179
YOGYAKARTA	Σ Truck	70	12.9%	79	-65.8%	27	74.1%	47	6.4%	50
	Σ Trailer	0	.0%	6	166.7%	16	-43.8%	9	44.4%	13
	Sub Total	70	21.4%	85	-49.4%	43	30.2%	56	12.5%	63
EAST JAVA	Σ Truck	1,121	6.6%	1,195	-18.3%	976	57.0%	1,532	-4.0%	1,471
	Σ Trailer	336	58.9%	534	32.6%	708	-1.1%	700	-17.4%	578
	Sub Total	1,457	18.7%	1,729	-2.6%	1,684	32.5%	2,232	-8.2%	2,049
TOTAL JAVA	Σ Truck	3,283	16.3%	3,875	4.6%	4,052	69.4%	6,866	-3.8%	6,617
	Σ Trailer	1,141	50.9%	1,723	2.7%	1,768	35.2%	2,390	-8.1%	2,196
	Sub Total	4,474	25.1%	5,597	4.0%	5,820	59.0%	9,256	-4.8%	8,813

Source : LLAJR

Table 3.3.3 Truck Trip Generation by Major Urban Centers in West Java, 1983

URBAN CENTRE	PICK-UP	%	2-AXLE	%	3-AXLE	%	TRAILER	%	TOTAL	%
BANDUNG	11,097	20.5%	13,978	13.5%	62	4.0%	111	1.5%	25,248	15.1%
BOGOR	9,548	17.7%	11,717	11.3%	33	2.1%	245	3.3%	21,543	12.9%
CIREBON	5,713	10.6%	8,159	7.9%	38	2.5%	2,097	27.9%	16,007	9.6%
SUKABUMI	1,065	2.0%	2,804	2.7%	7	.5%	133	1.8%	4,009	2.4%
TASIKMALAYA	2,557	4.7%	3,587	3.5%	168	10.9%	105	1.4%	6,417	3.8%
GARUT	1,715	3.2%	1,957	1.9%	1	.1%	5	.1%	3,678	2.2%
BEKASI	4,586	8.5%	17,388	16.7%	225	14.5%	1,541	20.5%	23,740	14.2%
TANGERANG	4,173	7.7%	7,497	7.2%	368	23.8%	511	6.8%	12,549	7.5%
CIANJUR	2,502	4.6%	4,481	4.3%	10	.6%	98	1.3%	7,091	4.2%
SERANG	1,292	2.4%	4,742	4.6%	175	11.3%	255	3.4%	6,464	3.9%
KERAWANG	4,362	8.1%	13,404	12.9%	347	22.4%	2,066	27.5%	20,179	12.1%
PURWAKARTA	1,886	3.5%	3,868	3.7%	15	1.0%	109	1.4%	5,878	3.5%
CIBINONG	1,424	2.6%	8,212	7.9%	84	5.4%	226	3.0%	9,946	6.0%
SUBANG	2,122	3.9%	2,048	2.0%	14	.9%	24	.3%	4,208	2.5%
TOTAL	54,042	100.0%	103,842	100.0%	1,547	100.0%	7,526	100.0%	166,957	100.0%

Source : Land Transport Development Plan, Directorate General of Land Transport and Waterway, 1985

a) Jakarta had the major concentration of truck traffic (about 38,200 vehicle trips/day).

b) Bogor, Tangerang and Bekasi which are situated in the sphere of influence of Jakarta also generated a large amount of truck traffic at 21,500, 23,700 and 12,500 vehicle trips/day respectively.

c) Karawang as the adjacent urban center to Bekasi generated about 20,200 vehicle trips/day this is more than Tangerang urban center. It is presumed that a large number of truck trip generation from Bekasi and Karawang was brought about by the construction of Jakarta-Cikampek Tollway.

d) Cirebon was the important urban center in the east part of West Java with more than 16,000 vehicle trips/day.

e) Most of the truck traffic generated by each urban center was predominated by 2 axle truck, excluding the urban center of Subang.

f) The highest numbers of trailer traffic was found in Cirebon, Karawang and Bekasi.

3.4 Railway Transportation

3.4.1 Railway Operation

Railway is the other land transportation system for inter-city freight and passenger traffic. Especially, railways in Jabotabek area are mostly used for commuting travel. The railway network in Java is classified into 3 operational areas i.e. West, Central and East Exploitation areas. The network is spread out from the west side of Java at Merak up to the east-side at Banyuwangi. However, the route of the railway could be classified into the north-side route and the south-side route (see Fig. 3.4.1). The total length of railway network in the West Exploitation Area which covers the whole DKI Jakarta and West Java provinces, and a part of Central Java, is 1,268 km or about 38% of the total length in Java.

According to the Land Transport Development Plan 1985, the main concentration of rail traffic is centered on Jakarta. The major flow is along the Jakarta-Cikampek corridor, corresponding with the double track section, with up to 88 trains/day. The continuing section along Cikampek to Cirebon has up to 55 trains/day. Table 3.4.1 shows the traffic characteristics of several main corridors in Java.

The remaining routes are essentially branch lines which have smaller traffic flows, varying between 5 to 10 trains/day only.

Table 3.4.1 Rail Traffic Characteristic along Major Routes in Java

No.	Name of Route	Number of train/day
1.	Jakarta-Cikampek	up to 88
2.	Cikampek-Cirebon	up to 55
3.	Cirebon-Semarang-Surabaya	30-55
4.	Cikampek-Bandung, Banjar	30-45
5.	Merak-Rangkasbitung-Jakarta	20-30
6.	Bogor-Jakarta	20-25
7.	Cirebon Purwokerto-Yogya-Solo-Surabaya	30-40
8.	Surabaya-Malang	30-35
9.	Bangil-Jember	15-20

Source: Land Transport Development Plan, 1985

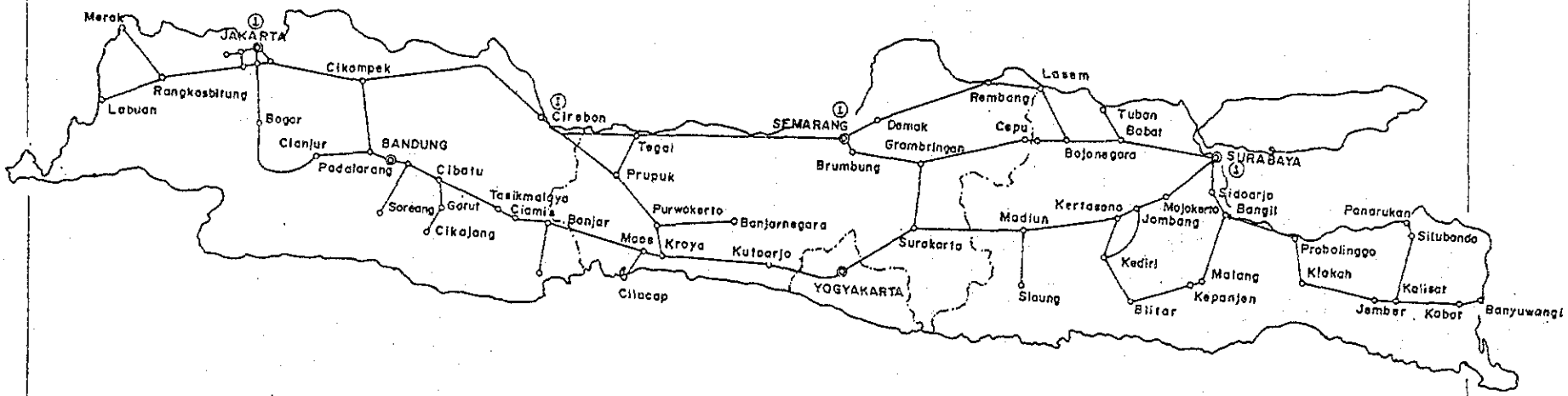

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Fig. 3.4.1 Railway Network in Java

3.4.2 Passenger Traffic

Table 3.4.2 shows the number of railway passenger trips by each province in Java. The total of railway passengers was some 72 million in Java in 1986. In general, excluding West Java province, numbers of traffic fluctuated and tended not to increase over the years 1980 to 1986.

Table 3.4.2 Number of Railway Passsenger Traffic in Java

(x1000)

	1980	1981	1982	1983	1984	1985	1986
DKI Jakarta*)	n.a	n.a	23,071	22,669	23,986	23,486	21,908
Rate of Growth				-1.7%	5.8%	-2.1%	-6.7%
West Java	25,457	26,742	26,843	29,594	30,500	30,600	32,066
Rate of Growth		5.0%	.4%	10.2%	3.1%	.3%	4.8%
Central Java	5,796	5,269	5,349	4,943	5,239	5,693	5,719
Rate of Growth		-9.1%	1.5%	-7.6%	6.0%	8.7%	.5%
Yogyakarta	788	759	803	650	714	n.a	n.a
Rate of Growth		-3.7%	5.8%	-19.0%	9.8%		
East Java	n.a	n.a	4,910	7,406	7,490	5,210	5,489
Rate of Growth				50.8%	1.1%	-30.4%	5.3%

Note: *) excluding Jabotabek Railway Passengers Traffic
n.a means data is not available

Source: Statistical Year Book of each Province in Java

Data from the Division of Information System for the Indonesian State Railways (PJKA-Perusahaan Jawatan Kereta Api) was available for analyzing the passenger trip OD matrix in April 1988.

Recently, the total daily passenger trips by railway in Java is 119,762, whereas intra-West Java province trips is about 57% of that total at 68,265. Furthermore, Jabotabek is the principal region for trip generation and it has more than 37% of the total intra-regional trips for all Java and 65% of West Java.

Fig. 3.4.2 shows the distribution of trip generation railway passenger trips. Table 3.4.3 shows the number of trip generation and attraction in certain principal urban centers in West Java. However, as shown by the inter-city bus and truck transportation characteristics, the main concentration area is still centralized in

Jabotabek and it is followed by Bandung. In this case, Banjar/Ciamis shows a slight difference while the numbers of trip generation and attraction become higher closer to Bandung. Table 3.4.4 is the summary of OD Matrix which fit into each development region in West Java, and on which basis the desire lines are prepared as shown in Fig. 3.4.3.

Table 3.4.3 Number of Railway Passenger Trip Generation and Attraction in West Java, April 1988

NO	URBAN CENTRE	TRIP GENERATION	TRIP ATTRACTION
1	DKI Jakarta	30,686	29,690
2	Bogor	26,282	24,758
3	Bandung	5,077	6,362
4	Cirebon	963	1,053
5	Cianjur	1,140	1,025
6	Cikampek	676	614
7	Sukabumi	872	629

Source : PJKA

Table 3.4.4 Summary of Railway Passenger Trip Distribution, 1988

O DESTINATION / ORIGIN	Banten	Jagorawi	Purwasuka	Cirebon	Sukabumi	Bandung Raya	Priangan Timur	CENTRAL JAVA	EAST JAVA	Others
Banten	127	398	0	2	0	0	0	64	15	10
Jagorawi	1803	45016	1130	1256	232	1917	229	6664	2135	7
Purwasuka	6	1618	217	218	1	180	70	161	47	2
Cirebon	1	1307	225	723	0	9	0	315	32	0
Sukabumi	0	461	2	0	223	186	0	0	0	0
Bandung Raya	0	1748	192	0	169	2923	2181	620	314	0
Priangan Timur	0	378	89	0	4	2574	923	849	151	0
CENTRAL JAVA	17	5269	155	322	0	583	663	7450	1406	0
EAST JAVA	14	1726	15	144	0	561	223	1512	19484	6
Others	0	0	0	0	0	0	0	0	0	4

Souce : PJKA

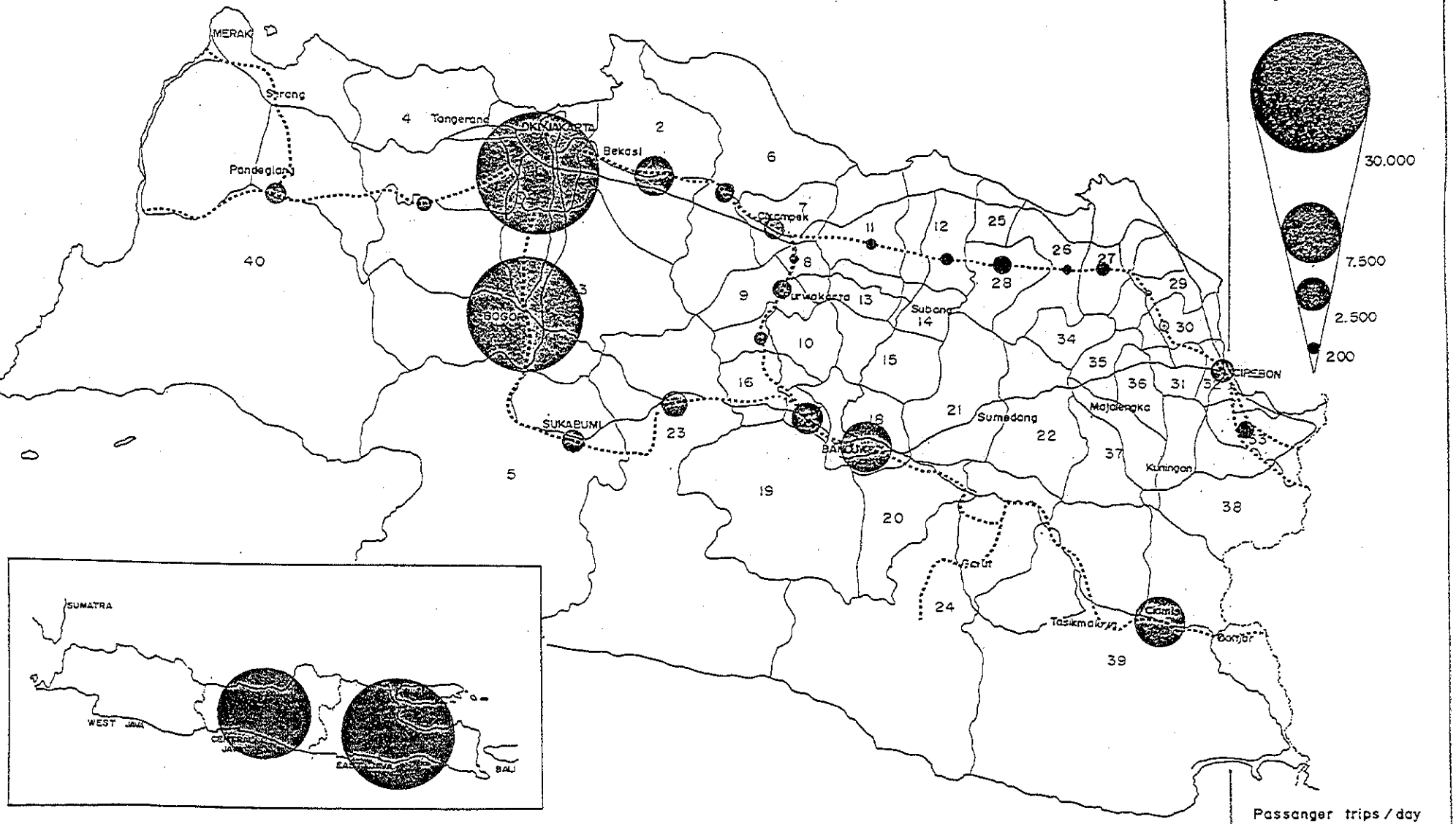

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Fig. 3.4.2 Distribution of Trip Generation for Railway Passenger

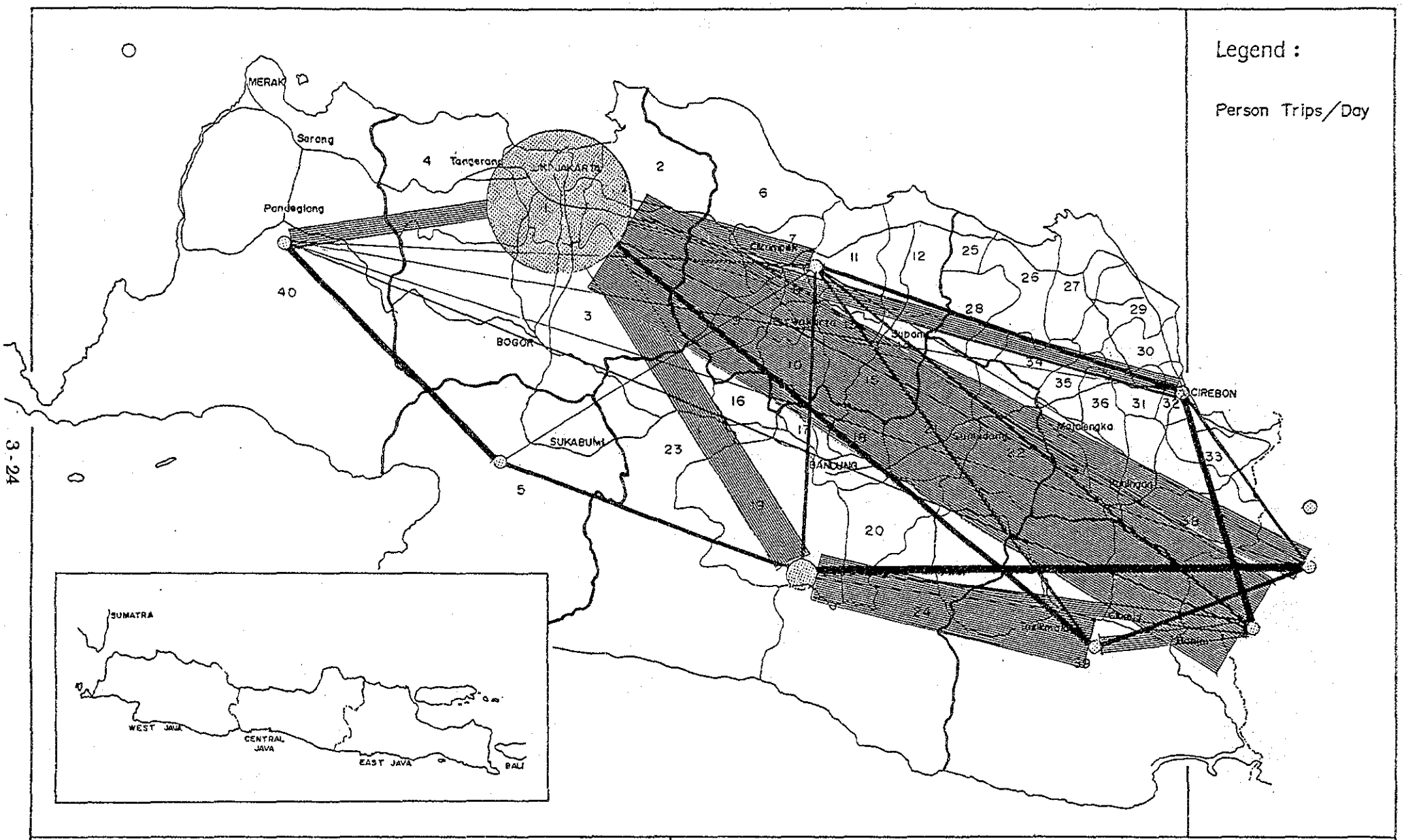

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Fig. 3.4.3 Trip Distribution of Railway Passenger