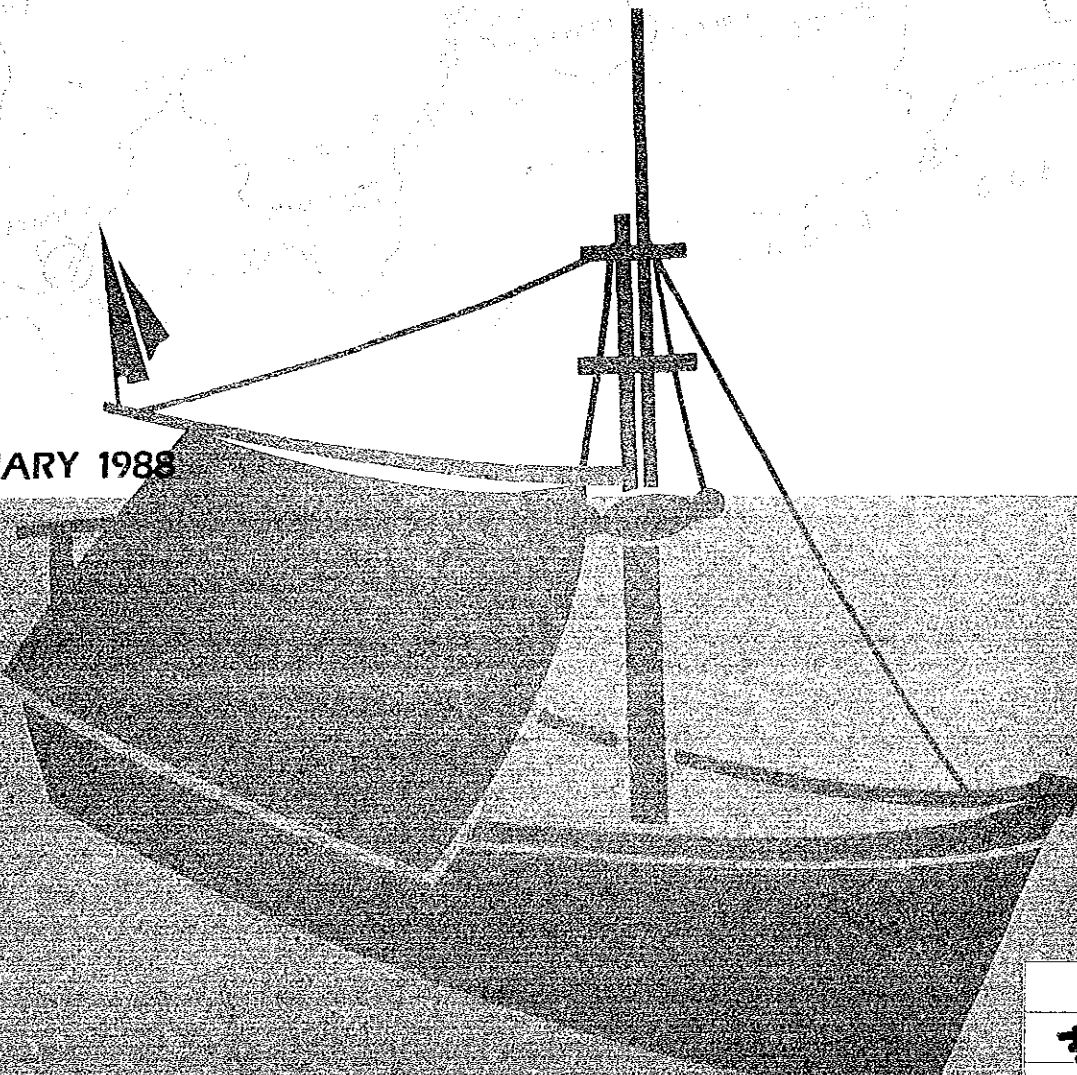


 THE STUDY ON THE REGIONAL DEVELOPMENT PROJECT
IN THE WESTERN PART OF JAVA

VOLUME 2
**MASTER PLAN
(MAIN REPORT)**

FEBRUARY 1988



JICA LIBRARY



1065008[3]



THE STUDY ON THE REGIONAL DEVELOPMENT PROJECT IN THE WESTERN PART OF JAVA

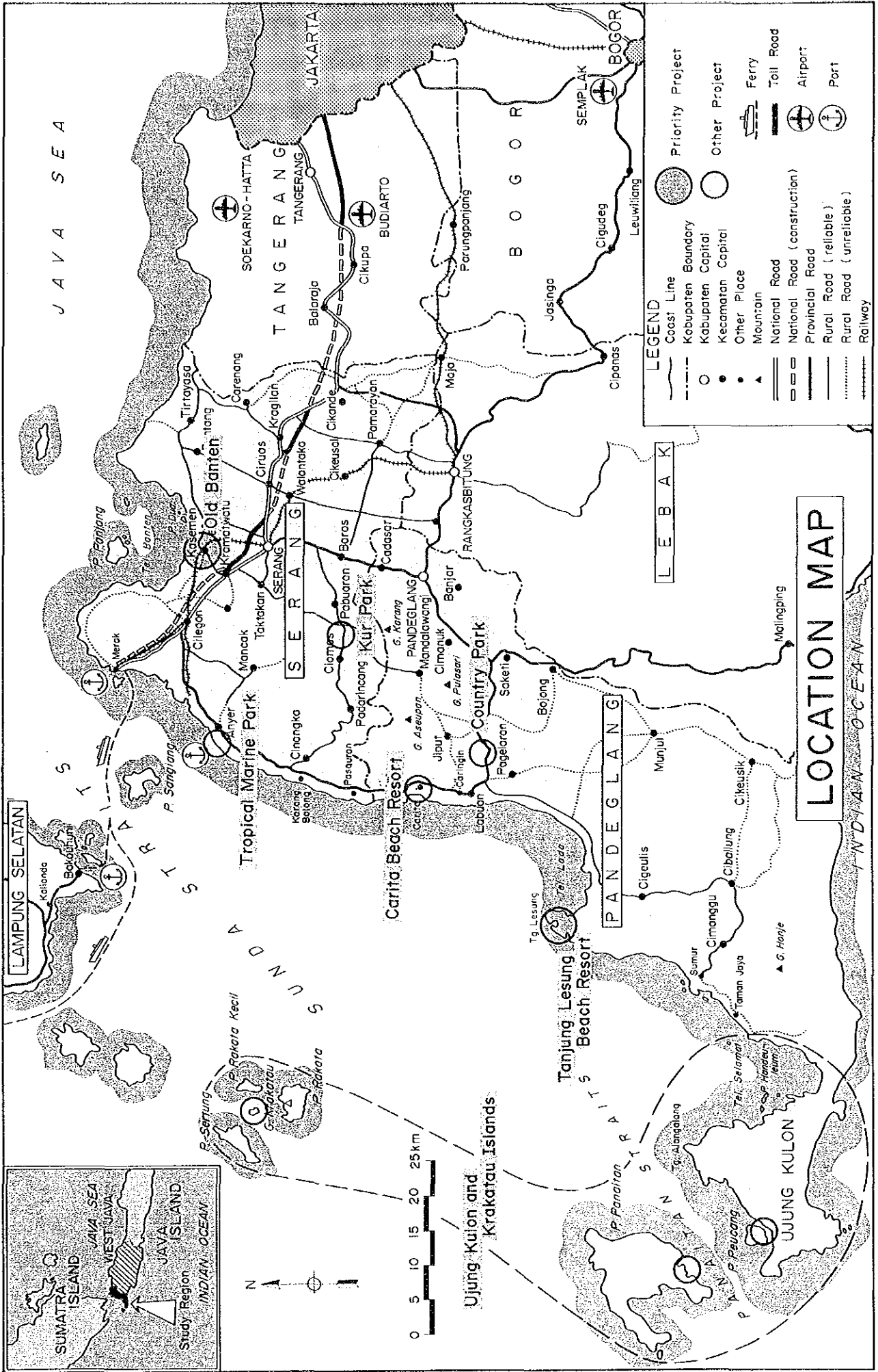
VOLUME ②

MASTER PLAN (MAIN REPORT)

FEBRUARY 1988

国際協力事業団

受入 月日	63.4.04	108
登録 No.	17476	75.9 SDF



J A V A S E A

J A K A R T A

T A N G E R A N G

B O G O R

S E R A N G

R A N G K A S B I T U N G

P A N D E G L A N G

L O C A T I O N M A P

LEGEND

- Coast Line
- Kabupaten Boundary
- Kabupaten Capital
- Kecamatan Capital
- Other Place
- Mountain
- National Road
- National Road (construction)
- Provincial Road
- Rural Road (reliable)
- Rural Road (unreliable)
- Railway
- Priority Project
- Other Project
- Ferry
- Toll Road
- Airport
- Port

L E B A K

I N D I A N O C E A N

LAMPUNG SELATAN

KALIDESA

PANDEGLANG

BOJONG LAYA

BOJONG

BOJONG

BOJONG

BOJONG

BOJONG

BOJONG

BOJONG

BOJONG

BOJONG

BOJONG

BOJONG

BOJONG

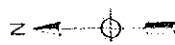
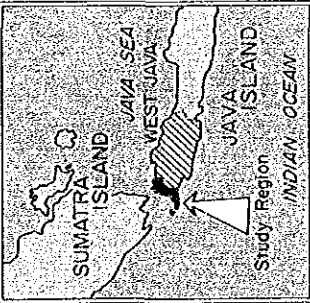
BOJONG

BOJONG

BOJONG

BOJONG

BOJONG



Ujung Kulon and Krakatau Islands

Tanjung Lesung Beach Resort

Carita Beach Resort

Tropical Marine Park

Kur Park

Country Park

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

Ujung Kulon

MASTER PLAN STUDY
ON
THE REGIONAL DEVELOPMENT PROJECT
IN
THE WESTERN PART OF JAVA
(MAIN REPORT)

TABLE OF CONTENTS

	<u>Page</u>
Location Map	
Table of Contents	i
List of Tables	v
List of Figures	x
List of Reports	xiv
Abbreviations	xvi
Units of Measurement	xx
Chapter 1 INTRODUCTION	1-1
1.1 General Background	1-1
1.2 The Objectives	1-8
1.3 Activities of JICA Study Team	1-9
1.4 Organization of the Report	1-14
1.5 Acknowledgement	1-15
Chapter 2 OUTLINE OF THE STUDY REGION	2-1
2.1 The Background	2-1
2.2 Natural Conditions	2-2
2.2.1 Topography	2-2
2.2.2 Hydrography	2-2
2.2.3 Climate	2-2
2.2.4 Flora and fauna	2-3
2.2.5 Oceanography	2-3

	<u>Page</u>
2.3 Socio-economy	2-4
2.3.1 Administration	2-4
2.3.2 Population	2-5
2.3.3 GRDP and regional income	2-8
2.3.4 Agriculture	2-11
2.3.5 Fisheries	2-16
2.3.6 Manufacturing	2-19
2.4 Infrastructure	2-19
2.4.1 Transportation	2-19
2.4.2 Telecommunications	2-41
2.4.3 Water supply	2-45
2.4.4 Electricity	2-55
2.4.5 Other infrastructures	2-60
2.5 Socio-culture	2-61
2.5.1 Language	2-61
2.5.2 Religion	2-62
2.5.3 Education	2-63
2.5.4 Sanitation and health	2-63
2.6 Land Use and Land Tenure System	2-64
2.6.1 Land use	2-64
2.6.2 Land tenure system	2-67
 Chapter 3 CONDITIONS OF TOURISM	 3-1
3.1 Tourism in ASEAN Countries	3-1
3.1.1 International tourist destination ...	3-1
3.1.2 Trend of tourism	3-6
3.2 Tourism in Indonesia	3-15
3.2.1 Trends in tourism	3-15
3.2.2 Tourist destinations	3-36
3.2.3 Tourist facilities and services	3-39
3.3 Tourism in the Study Region	3-49
3.3.1 Trends in tourism	3-49
3.3.2 Tourist resources	3-54
3.3.3 Tourist facilities	3-68

	<u>Page</u>
3.4 Institutions and Organizations for Tourism Development	3-72
3.4.1 Legislations and institutions	3-72
3.4.2 Organization for tourism development	3-72
 Chapter 4 GUIDELINES FOR REGIONAL DEVELOPMENT	 4-1
4.1 Direction of Regional Development	4-1
4.1.1 Development potentials	4-1
4.1.2 Development strategies	4-4
4.1.3 Direction of development	4-7
4.2 Regional Development and Tourism	4-17
4.3 Direction of Tourism Development	4-19
4.3.1 Effects of tourism development	4-19
4.3.2 Development potentials of tourism ..	4-22
4.3.3 Direction of tourism development ...	4-28
 Chapter 5 FRAMEWORK FOR SOCIO-ECONOMY AND TOURISM DEMAND	 5-1
5.1 Regional Socio-economy	5-1
5.1.1 Population	5-1
5.1.2 GRDP and regional income	5-11
5.2 Tourism Demand	5-26
5.2.1 Tourism demand generated by Province	5-29
5.2.2 Tourism demand in West Java	5-37
5.2.3 Tourism demand in the study region .	5-40
 Chapter 6 MASTER PLAN FOR LONG-RANGE DEVELOPMENT ...	 6-1
6.1 Development Concept	6-1
6.2 Target Capacity of the Proposed Projects ...	6-7
6.3 Prposed Projects	6-10
6.3.1 Tropical Marine Park	6-10
6.3.2 Kur Park	6-19
6.3.3 Old Banten Site	6-27

	<u>Page</u>
6.3.4 Beach Resort	6-35
6.3.5 Ujung Kulon and Krakatau Islands	6-41
6.3.6 Country Park	6-54
6.4 Considerations for Execution	6-66
6.4.1 Infrastructure	6-66
6.4.2 Environmental aspects	6-72
6.4.3 Institutional arrangements	6-77
 Chapter 7 OPTIMUM STAGE PLAN AND PRIORITY PROJECTS .	 7-1
7.1 Concept and Criteria	7-1
7.1.1 General concepts	7-1
7.1.2 Approach to the study	7-3
7.1.3 Criteria for rating	7-4
7.2 Alternative Stage Plans	7-9
7.2.1 Basic consideration	7-10
7.2.2 Alternative stage plans	7-11
7.3 Optimum Stage Plan and Priority Projects ...	7-13
7.3.1 Basic data for rating	7-13
7.3.2 Optimum stage plan and priority projects	7-18
 Chapter 8 RECOMMENDATIONS AND CONCLUSIONS	 8-1
8.1 Overall Evaluation	8-1
8.2 Objectives	8-1
8.3 Stage Implementation	8-2
8.4 Conclusions	8-2

LIST OF TABLES

		<u>Page</u>
Table 2-1	POPULATION DATA	2-6
Table 2-2	GDP OF INDONESIA AND GRDP OF DKI JAKARTA, WEST JAVA AND BANTEN REGION, 1980 - 1983	2-9
Table 2-3	GRDP BY INDUSTRIAL ORIGIN OF BANTEN REGION IN 1973 AND 1983	2-10
Table 2-4	PRINCIPAL FOOD CROPS IN THE STUDY REGION	2-13
Table 2-5	LENGTH OF ROADS BY SURFACE TYPE	2-23
Table 2-6	CONDITION OF RURAL ROADS	2-25
Table 2-7	MOTOR VEHICLE REGISTRATION	2-28
Table 2-8	FREIGHT TRAFFIC IN WEST JAVA	2-32
Table 2-9	PASSENGER TRAFFIC IN JAVA	2-32
Table 2-10	LOCOMOTIVES ASSIGNED TO JAKARTA-MERAK ..	2-33
Table 2-11	FREIGHT CARS ASSIGNED TO JAKARTA-MERAK LINE	2-34
Table 2-12	PASSENGER AND CARGO MOVEMENT AT MERAK ..	2-35
Table 2-13	CIVIL AVIATION FACILITIES AROUND THE STUDY AREA	2-39
Table 2-14	EXISTING TELEPHONE EXCHANGE STATIONS IN THE STUDY REGION	2-42
Table 2-15	CONSTRUCTION PLAN OF DIGITAL EXCHANGES IN THE STUDY REGION	2-45
Table 2-16	PRESENT CONDITION OF WATER SUPPLY SERVICE FOR DOMESTIC USE IN KAB. SERANG	2-48
Table 2-17	PRESENT CONDITION OF WATER SUPPLY SERVICE FOR DOMESTIC USE IN KAB. PANDEGLANG	2-49
Table 2-18	DEVELOPMENT PLAN OF DOMESTIC WATER SUPPLY SYSTEM IN KAB. SERANG	2-52
Table 2-19	DEVELOPMENT PLAN OF DOMESTIC WATER SUPPLY SYSTEM IN KAB PANDEGLANG	2-52

	<u>Page</u>
Table 2-20	NUMBER OF CUSTOMERS, ELECTRICITY CONSUMPTION SERVED BY PLN IN 1984/85 ... 2-59
Table 2-21	TYPE OF FUEL FOR LIGHTING BY HOUSEHOLD IN 1980 2-59
Table 2-22	PRESENT CONDITION OF WASTE WATER TREATMENT 2-61
Table 2-23	LAND USE OF THE STUDY REGION 2-66
Table 3-1	MAJOR TOURIST DESTINATIONS IN ASEAN OTHER THAN INDONESIA 3-2
Table 3-2	AVERAGE LENGTH OF STAY IN 1984 & 1985 .. 3-11
Table 3-3	VISITOR EXPENDITURES 3-13
Table 3-4	AVERAGE HOTEL OCCUPANCY RATE, 1983 & 1984 3-14
Table 3-5	ANNUAL NUMBER OF VISITORS TO MAJOR TOURIST OBJECTS 3-15
Table 3-6	DAILY PEAK RATIO OF VISITOR ARRIVALS TO ANNUAL ONES IN MAJOR TOURIST OBJECTS 3-17
Table 3-7	NUMBER OF VISITOR ARRIVALS IN WEST JAVA BY CATEGORY 3-18
Table 3-8	PROPORTION OF DOMESTIC PARTICIPANTS IN VACATION AND RECREATION TRAVEL BY CATEGORY 3-19
Table 3-9	PARTICIPATION RATIO IN TRAVELS TO TOURIST OBJECTS DURING 3 MONTHS IN 1984 3-20
Table 3-10	AVERAGE NUMBER OF TRAVELS PER PERSON DURING 6 MONTHS IN 1984 3-21
Table 3-11	NUMBER OF TRAVELS MAIN MOTIVATION DURING 6 MONTHS IN 1984 3-21
Table 3-12	NUMBER OF TRAVELS BY MAIN MOTIVATION DURING 6 MONTHS IN 1984 3-22
Table 3-13	PLACES FOR VISITING 3-23
Table 3-14	NUMBER OF TRAVELS ON VACATION AND RECREATION BY MODE OF TRANSPORTATION DURING 6 MONTHS IN 1984 3-24

	<u>Page</u>
Table 3-15	TYPE OF ACCOMMODATION FOR OVERNIGHT TRAVEL TO TOURIST OBJECTS 3-25
Table 3-16	NUMBER OF TRAVELS ON VACATION AND RECREATION BY PROVINCE OF ORIGIN 3-26
Table 3-17	MAJOR FLOW OF OVERALL DOMESTIC TRAVELS BETWEEN ORIGIN AND DESTINATION BY PROVINCE 3-27
Table 3-18	DOMINANT NATIONALITIES OF FOREIGN TOURISTS 3-29
Table 3-19	AGE GROUP OF FOREIGNERS 3-31
Table 3-20	PURPOSE OF VISIT OF FOREIGN VISITORS ... 3-32
Table 3-21	MAJOR DESTINATIONS OF FOREIGN VISITORS 3-35
Table 3-22	STOPOVER COUNTRIES ON TRIPS OF INCOMING FOREIGN TOURISTS VISITING 5 DESTINATIONS 3-36
Table 3-23	HOTEL PERFORMANCE (OCCUPANCY RATE) IN JAKARTA AND BALI 3-40
Table 3-24	HOTELS IN 24 PROVINCES IN 1985 3-41
Table 3-25	TOTAL INNS IN 7 PROVINCES IN 1984 3-43
Table 3-26	TOTAL YOUTH HOSTELS IN 1984 3-43
Table 3-27	RESTAURANTS IN 24 PROVINCES 3-44
Table 3-28	NUMBER OF RECREATION AND AMUSEMENT PLACES IN 8 PROVINCES, 1984 3-45
Table 3-29	TRAVEL BUREAUX IN INDONESIA IN 1984 3-47
Table 3-30	NUMBER OF TOUR LEADERS AND TOUR GUIDES BY PROVINCE, 1984 3-48
Table 3-31	NUMBER OF VISITOR ARRIVALS IN THE STUDY REGION BY DESTINATION 3-50
Table 3-32	MODIFIED NUMBER OF VISITOR ARRIVALS IN THE STUDY REGION (1984) 3-51
Table 3-33	PROPORTION OF VISITORS BY ACTIVITY IN THE STUDY REGION IN 1984 3-52
Table 3-34	SITUATION OF ACCOMMODATIONS IN THE STUDY REGION IN 1984 3-53

	Page
Table 3-35	ACCOMMODATIONS IN THE STUDY REGION IN 1984 3-69
Table 4-1	OUTLINE OF THE GUIDELINES FOR REGIONAL DEVELOPMENT BY SECTOR AND ZONE 4-15
Table 5-1	POPULATION IN INDONESIA, JAVA, WEST JAVA, DKI JAKARTA AND THE STUDY REGION IN 1961, 1971 AND 1980 5-2
Table 5-2	POPULATION DISTRIBUTION BY KECAMATAN IN THE STUDY REGION IN 1961, 1980 AND 1980 - 85 5-4
Table 5-3	POPULATION GROWTH RATE DURING THE PERIOD OF 1961 - 85 AND POPULATION PER DESA, SQUARE KILOMETER AND HOUSEHOLD BY KECAMATAN IN THE STUDY REGION IN 1985 .. 5-5
Table 5-4	NUMBER OF FARM HOUSEHOLDS IN WEST JAVA AND THE STUDY REGION IN 1980 5-8
Table 5-5	POPULATION PROJECTIONS IN INDONESIA, WEST JAVA, DKI JAKARTA AND THE STUDY REGION, 1985 - 2000 5-9
Table 5-6	LABOR FORCE PROJECTIONS IN THE STUDY REGION IN 1990 - 2000 5-11
Table 5-7	GRDP IN THE STUDY REGION, BANTEN REGION AND WEST JAVA, 1975 - 1982 5-18
Table 5-8	MEDIUM TERM PROSPECTS: GDP/GRDP AND GDP/GRDP PER CAPITA PROJECTIONS IN INDONESIA, WEST JAVA, DKI JAKARTA, BANTEN AND THE STUDY REGION IN 1990 AND 1995 5-24
Table 5-9	PROJECTED NUMBER OF DOMESTIC TRIPS TO TOURIST OBJECTS GENERATED BY PROVINCE 5-32
Table 5-10	PROJECTED NUMBER OF ROOMS IN THE CLASSIFIED HOTELS OF 10 PROVINCES 5-35
Table 5-11	TOTAL PERSON-VISITS BY ACTIVITY IN THE STUDY REGION IN 2010 5-41
Table 5-12	TOURISM DEMAND BY DESTINATION AND ACTIVITY IN 2010 5-44
Table 5-13	TOURISM DEMAND BY CATEGORY IN 2010 5-45

		Page
Table 6-1	OUTLINE OF THE PROPOSED PROJECTS	6-6
Table 6-2	SELECTION OF IMPACT BY PROJECT	6-74
Table 6-3	COOPERATIVE ACTIVITIES CONCERNING ENVIRONMENT	6-92
Table 7-1	WEIGHTING OF THE PROPOSED INDICATORS ...	7-5
Table 7-2	REQUIREMENTS OF STAGE PLANS	7-11
Table 7-3	FINAL RESULT OF OVERALL RATING	7-19

LIST OF FIGURES

		Page
Fig. 1-1	GENERAL LOCATION MAP OF INDONESIA	1-2
FIG. 1-2	DISTRIBUTION OF GDP BY SECTOR	1-4
Fig. 1-3	GDP GROWTH RATES OF INDONESIA, 1971 - 1984	1-5
Fig. 1-4	EXPORT & IMPORT BY VALUE (FOB)	1-6
Fig. 2-1	FOOD CROP PRODUCTION IN THE STUDY REGION, 1985	2-12
Fig. 2-2	VEGETABLE PRODUCTION IN THE STUDY REGION, 1985	2-14
Fig. 2-3	FRUITS PRODUCTION IN THE STUDY REGION, 1985	2-15
Fig. 2-4	PLANTATION CROP PRODUCTION IN THE STUDY REGION, 1985	2-17
Fig. 2-5	MARINE FISHERY BASES IN THE STUDY REGION, 1985	2-18
Fig. 2-6	MAJOR TRANSPORTATION FACILITIES	2-20
Fig. 2-7	TRANSPORTATION SYSTEM IN AND AROUND THE STUDY REGION	2-21
Fig. 2-8	ROAD WORKS PROGRAM OF BINA MARGA	2-27
Fig. 2-9	TRAFFIC VOLUME	2-30
Fig. 2-10	RAILWAY REHABILITATION PROGRAM FOR COAL TRANSPORTATION	2-37
Fig. 2-11	EXISTING TELEPHONE NETWORK	2-43
Fig. 2-12	ORGANIZATION FOR THE WATER SUPPLY SYSTEM	2-46
Fig. 2-13	DISTRIBUTION OF WATER SERVICE AREAS	2-50
Fig. 2-14	MAJOR WATER SOURCE DEVELOPMENT PLAN	2-54
Fig. 2-15	PRESENT CONDITION OF THE ELECTRIC FACILITIES	2-58
Fig. 2-16	PRESENT LAND USE OF THE STUDY REGION	2-65

	<u>Page</u>
Fig. 2-17	PRESENT LAND TENURE 2-68
Fig. 3-1	MAIN TOURIST DESTINATIONS IN ASEAN 3-4
Fig. 3-2	NUMBER OF INTERNATIONAL TOURISTS 3-7
Fig. 3-3	NUMBER OF VISITOR ARRIVALS 3-8
Fig. 3-4	VISITOR ARRIVALS BY RESIDENCE 3-10
Fig. 3-5	EXAMPLE OF SEASONAL FLUCTUATION IN TOURIST OBJECTS 3-16
Fig. 3-6	RATIO OF INCOMING FOREIGN TOURISTS FOR 10 PROVINCES 3-34
Fig. 3-7	TOURISM CONDITIONS IN THE STUDY REGION 3-59
Fig. 3-8	ORGANIZATION FOR TOURISM DEVELOPMENT 3-74
Fig. 4-1	DEVELOPMENT CORRIDORS AND DIVISION BY ZONE OF THE STUDY REGION 4-5
Fig. 4-2	PROBLEM STRUCTURE OF THE STUDY REGION 4-8
Fig. 4-3	PROPOSED REGIONAL DEVELOPMENT PROJECTS IN RELATION TO TOURISM DEVELOPMENT 4-16
Fig. 4-4	PRODUCTION SECTORS IN TOURISM DEVELOPMENT AND ITS EXPECTED EFFECTS 4-21
Fig. 4-5	TOURIST RESOURCES 4-23
Fig. 4-6	PRESENT AND EXPECTED FUTURE DISTRIBUTION OF THE MAJOR TOURIST DESTINATIONS 4-29
Fig. 4-7	BASIC DIRECTION OF TOURISM DEVELOPMENT BY AREA 4-32
Fig. 5-1	POPULATION DENSITY IN THE STUDY REGION ... 5-7
Fig. 5-2	GDP/GRDP GROWTH RATE OF INDONESIA, WEST JAVA, DKI JAKARTA AND BANTEN REGION, 1976 - 84 5-12
Fig. 5-3	DISTRIBUTION OF GDP/GRDP BY INDUSTRIAL ORIGIN IN INDONESIA, WEST JAVA, DKI JAKARTA AND BANTEN REGION IN 1980 5-14
Fig. 5-4	GDP/GRDP PER CAPITA OF INDONESIA, WEST JAVA, DKI JAKARTA AND BANTEN REGION IN 1974, 1979 AND 1984 5-16

	Page
Fig. 5-5	LEVELS OF INCOME PER CAPITA IN THE STUDY REGION 5-21
Fig. 5-6	APPROACH TO TOURISM DEMAND PROJECTION 5-27
Fig. 5-7	DETAILED FLOW CHART OF TOURISM DEMAND PROJECTION 5-28
Fig. 5-8	NUMBER OF DOMESTIC TRIPS PER PARTICIPANT AND HOUSEHOLD EXPENDITURE 5-31
Fig. 5-9	EXPLANATORY VARIABLES FOR FOREIGN TOURIST PROJECTION 5-33
Fig. 5-10	TREND OF WORLDWIDE INTERNATIONAL TOURISM 5-36
Fig. 5-11	PROJECTED DEMAND OF FOREIGN TOURISTS 5-37
Fig. 5-12	PROJECTED INDONESIAN TOURISM DEMAND DISTRIBUTED IN WEST JAVA 5-38
Fig. 5-13	FUTURE TOURISM TREND IN THE STUDY REGION 5-42
Fig. 6-1	FORMULATION OF PROPOSED PROJECTS..... 6-2
Fig. 6-2	LOCATION OF THE PROPOSED DEVELOPMENT PROJECTS 6-3
Fig. 6-3	SCHEMATIC PLAN OF TROPICAL MARINE PARK.... 6-16
Fig. 6-4	MODEL PLAN OF TROPICAL MARINE PARK 6-17
Fig. 6-5	VISUALIZATION OF TROPICAL MARINE PARK 6-18
Fig. 6-6	TYPICAL PATTERN OF KURHAUS (CURE HOUSE) .. 6-22
Fig. 6-7	SCHEMATIC PLAN OF KUR PARK 6-25
Fig. 6-8	MODEL PLAN OF KUR PARK 6-26
Fig. 6-9	LOCATION OF PLANNED FACILITIES IN OLD BANTEN SITE 6-32
Fig. 6-10	DEVELOPMENT PLAN OF BEACH RESORT AT TANJUNG LESUNG 6-40
Fig. 6-11	HIGH-SPEED BOAT..... 6-45
Fig. 6-12	PROPOSED CRUISING COURSE 6-49
Fig. 6-13	LAYOUT PLAN OF UJUNG KULON NATIONAL PARK 6-50

	<u>Page</u>
Fig. 6-14 SKETCH PLAN OF GUEST HOUSE IN PANAITAN ISLAND	6-51
Fig. 6-15 CRUISING BASE IN LABUAN	6-52
Fig. 6-16 LOCATION OF COUNTRY PARK	6-61
Fig. 6-17 SCHEMATIC PLAN OF COUNTRY PARK	6-63
Fig. 6-18 MODEL PLAN OF COUNTRY PARK	6-64
Fig. 6-19 ZONING FOR THE CONTROL OF TOURISM DEVELOPMENT	6-81
Fig. 7-1 DEVELOPMENT STAGES UP TO THE YEAR 2010 ...	7-2
Fig. 7-2 APPROACH TO THE STUDY ON PRIORITY PROJECTS	7-3
Fig. 7-3 ALTERNATIVE STAGE PLAN IN THE LONG RANGE PERIOD(SITES OF BEACH RESORT "C" AND "D").	7-12
Fig. 7-4 EXPLANATORY VARIABLES IN TREND OF TOURISM DEMAND	7-14
Fig. 7-5 TREND OF TOURISM DEMAND IN CASE OF ALTERNATIVE-3 (BEACH RESORT; SITE "C" = CASE C)	7-16
Fig. 7-6 OPTIMUM STAGE PLAN AND PRIORITY PROJECTS	7-20

LIST OF REPORTS

1. EXECUTIVE SUMMARY VOLUME 1
2. MASTER PLAN (MAIN REPORT) VOLUME 2
3. MASTER PLAN (ANNEXES) VOLUME 3
 - ANNEX I (A) SOCIO-ECONOMY
 - ANNEX I (B) INFRASTRUCTURE
 - ANNEX I (C) REGIONAL DEVELOPMENT
 - ANNEX I (D) CONDITIONS OF TOURISM
 - ANNEX I (E) TOURISM DEMAND AND PLANNING
 - ANNEX I (F) ENVIRONMENT
4. IMPLEMENTATION PROGRAMME (MAIN REPORT) VOLUME 4
5. IMPLEMENTATION PROGRAMME (ANNEXES) VOLUME 5
 - ANNEX II.A INFRASTRUCTURE
 - ANNEX II.A.1 PRELIMINARY DESIGN OF RESTORATION OF OLD MOAT
 - ANNEX II.A.2 IMPACTS OF TOURISM DEVELOPMENT ON ROAD TRANSPORTATION
 - ANNEX II.A.3 METHOD FOR STUDY ON CAPACITY OF 2-LANE ROAD
 - ANNEX II.A.4 WATER DEMAND PROJECTION
 - ANNEX II.A.5 COST COMPARISON OF WATER SUPPLY SYSTEM IN OLD BANTEN
 - ANNEX II.A.6 PRINCIPAL DESIGN CRITERIA FOR WATER SUPPLY SYSTEM
 - ANNEX II.A.7 SEWAGE TREATMENT
 - ANNEX II.A.8 DEMAND OF OTHER INFRASTRUCTURES
 - ANNEX II.A.9 EVALUATION OF BOAT TRANSPORT OPERATION FOR UJUNG KULON AND KRAKATAU ISLANDS
 - ANNEX II.B COST ESTIMATE
 - ANNEX II.B.1 DETAIL OF CONSTRUCTION COST (OLD BANTEN)
 - ANNEX II.B.2 LOCAL AND FOREIGN CURRENCY PORTION
 - ANNEX II.B.3 AREA AND SITE OF FACILITIES (BEACH RESORT)
 - ANNEX II.B.4 DETAILS OF DEVELOPMENT COST (BEACH RESORT)

ANNEX II.C	MANAGEMENT
ANNEX II.C.1	OPTIONAL TOUR ROUTE: STOP-OVERING OLD BANTEN
ANNEX II.C.2	PACKAGE TOUR ROUTE TO TANJUNG LESUNG
ANNEX II.D	ENVIRONMENT
ANNEX II.D.1	FLOW CHART OF EVALUATION FOR ENVIRONMENTAL FACTORS
ANNEX II.D.2	DISTRIBUTION OF MAJOR VEGETATION TYPES IN THE PULAU DUA NATURE RESERVE
ANNEX II.D.3	LIST OF FAUNA THAT EXIST IN FIELD (FOREST) OF TANJUNG LESUNG AREA
ANNEX II.D.4	LIST OF FLORA FREQUENTLY FOUND OUT IN FIELD (FOREST) AT TANJUNG LESUNG AREA
ANNEX II.D.5(1)	WATER ANALYSIS, TANJUNG LESUNG, PADEGLANG, JABAR (3-4 September 1987)
ANNEX II.D.5(2)	LOCATION OF STATIONS FOR WATER ANALYSIS
ANNEX II.D.6	DILUTION OF SEWAGE EFFLUENT
ANNEX II.D.7	LIST OF RESPONDENTS OF SOCIO-CULTURAL SURVEY AT OLD BANTEN PROJECT SITE
ANNEX II.D.8	RESULTS OF SOCIO-CULTURAL INTERVIEW (OLD BANTEN)
ANNEX II.D.9	LIST OF RESPONDENTS OF SOCIO-CULTURAL SURVEY AT BEACH RESORT PROJECT SITE
ANNEX II.D.10	RESULTS OF SOCIO-CULTURAL INTERVIEW (BEACH RESORT)
ANNEX II.D.11	A BRIEF SURVEY ON SOCIO-ECONOMIC CONDITION OF KECAMATAN CIGEULIS AND DESA TANJUNG JAYA
ANNEX II.D.12	INVESTIGATION SHEETS OF THE STATISTICAL DATA
ANNEX II.D.13	QUESTIONNAIRES OF INTERVIEW SURVEY
ANNEX II.E	PROJECT EVALUATION
ANNEX II.E.1	BASIC CONCEPT OF THE FINANCIAL INTERNAL RATE OF RETURN (FIRR)
ANNEX II.E.2	BASIC CONCEPT OF THE ECONOMIC INTERNAL RATE OF RETURN (EIRR)
ANNEX II.E.3	SENSITIVITY TO THE DELAY OF DEVELOPMENT
ANNEX II.E.4	METHODOLOGY OF CALCULATING CONSUMER'S SURPLUS
ANNEX II.E.5	ECONOMIC COST OF TRANSPORTATION

ABBREVIATIONS

National and International Organizations

ADB	: Asian Development Bank
APBD	: Anggaran Pendapatan & Belanja Daerah (Provincial & Regency Budget)
APBN	: Anggaran Pendapatan & Belanja Negara (National Budget)
ASEAN	: Association of South-East Asian Nations
ASEANTA	: ASEAN Travel Agencies Association
ASITA (APPI)	: Association of the Indonesian Tour and Travel Agencies (Asosiasi Perusahaan Perjalanan Indonesia)
BAPARDA	: Badan Pengembangan Pariwisata Daerah (Provincial Tourism Development Board)
BAPPARNAS	: Badan Pengembangan Pariwisata Nasional (National Tourism Development Board)
BAPPEDA	: Badan Perencanaan Pembangunan Daerah (Regional Development Planning Agency)
BAPPENAS	: Badan Perencanaan Pembangunan Nasional (National Development Planning Agency)
BPAM	: Badan Pengelola Air Minum (Water Supply Authority)
BPS	: Biro Pusat Statistik (Central Bureau of Statistics Office)
BTDC	: Bali Tourism Development Corporation
BUMN	: Badan Usaha Milik Negara (State Owned Enterprises)
DANA INPRES	: Special Budget
DEPARNAS	: Dewan Kepariwisata Nasional (National Tourism Council)
DEPDAGRI	: Departemen Dalam Negeri (Department of Home Affairs)
DEPDIKBUD (DEC)	: Departemen Pendidikan dan Kebudayaan (Department of Education and Culture)

DEPERIN	: Departemen Perindustrian (Department of Industry)
DEPHUB	: Departemen Perhubungan (Department of Communications)
DEPPARPOSTEL	: Departemen Pariwisata, Pos dan Telekomunikasi (Department of Tourism, Post and Telecommunication)
DEP.P.U.	: Departemen Pekerjaan Umum (Department of Public Works)
DEPTAN	: Departemen Pertanian (Department of Agriculture)
DIPARDA Tk. I	: Dinas Pariwisata Daerah Tingkat I (Provincial Tourist Service)
DIPARDA Tk. II	: Dinas Pariwisata Daerah Tingkat II (Kabupaten Tourist Service)
DIT. BINA MARGA	: Directorate General of Road Construction
DIT. CIPTA KARYA	: Directorate General of Human Settlement
DITJEN. HUB. DAR.	: Direktorat Jenderal Perhubungan Darat (Directorate General of Land Transport and Inland Waterways)
DITJEN. HUB. DARA.	: Direktorat Jenderal Perhubungan Udara (Directorate General of Air Transport)
DITJEN. HUB. LA.	: Direktorat Jenderal Perhubungan Laut (Directorate General of Sea Transport)
DITJEN. PAR. (DGT)	: Direktorat Jenderal Pariwisata (Directorate General of Tourism)
DIT. PHPA. (DGF)	: Direktorat Jendral Perlindungan Hutan dan Pelestarian Alam (Directorate General of Forest Protection and Nature Conservation)
DPU (P or K)	: Dinas Pekerjaan Umum (Propinsi-Kabupaten/ Kotamadya) (Provincial or Local Public Works Services)
IBRD	: International Bank for Reconstruction and Development
IDA	: International Development Association

IHRA (PHRI) : Indonesian Hotel and Restaurant Association
(Perhimpunan Hotel dan Restoran Indonesia)

INPRES : Instruksi Presiden
(Presidential Decree)

ITB : Institut Teknologi Bandung
(Bandung Institute of Technology)

JICA : Japan International Cooperation Agency

JNTO : Japan National Tourist Organization

KANDEP : Kantor Departemen
(District Office of the Department)

KANWIL : Kantor Wilayah
(Regional Office)

KLH : Kependudukan dan Lingkungan Hidup
(Population and Environment)

MOT : Ministry of Transport (Japan)

NATOUR : National and Tourism Corporation

PATA : Pacific Asia Travel Association

PDAM : Perusahaan Daerah Air Minum
(Local Water Supply Company)

PERUMTEL : Perusahaan Umum Telekomunikasi
(Public Company of Telecommunication)

PHPA : Perlindungan Hutan dan Pelestarian Alam
(Forest Protection and Nature Conservation Office)

PJKA : Perusahaan Jawatan Kreta Api
(National Railway Company)

PLN : Perusahaan Listrik Negara
(Public Corporation of Electricity)

PT. HII : Hotel Indonesia International
(International Hotel Corporation)

PT. JASA MARGA : Indonesian Highway Corporation

Local Terms

Bukit	: Hill
Bupati	: Head of Kabupaten (Regency)
Danau	: Lake
Desa/Kampung	: Village
DKI Jakarta	: Daerah Khusus Ibukota Jakarta Raya (Special District Capital Greater Jakarta)
Gunung (G.)	: Mountain
IKK	: Ibu Kota Kecamatan (Sub-District Town)
Kabupaten (Kab.)	: Regency
Kecamatan (Kec.)	: Sub-District
Kelurahan	: Village
Kotamadya (Kodya)	: Municipality
KUD	: Koperasi Unit Desa (Village Unit Cooperative)
Lama	: Old
Palawija	: Upland crops
Pantai	: Beach
PELITA	: Pembangunan Lima Tahun (Five Year Development)
PT	: Perusahaan Terbatas (Private Limited Company)
Pulau (P.)	: Island
REPELITA	: Rencana Pembangunan Lima Tahun (Five Year Development Plan)
Sungai	: River
Tanjung (Tg.)	: Cape
Wilayah	: Region

UNITS OF MEASUREMENT

Length

mm = millimeter
cm = centimeter
m = meter
km = kilometer

Area

cm² = square centimeter
m² = square meter (or sq.m)
ha = hectare
km² = square kilometer

Volume

cm³ = cubic centimeter
lit = litre
m³ = cubic meter

Weight

mg = milligram
g = gram
kg = kilogram
ton = metric ton

Electrical Measures

V = Volt
kV = Kilovolt
A = Ampere
kW = Kilowatt
MW = Megawatt

Other Measures

% = percent
PS = horsepower
° = degree
' = minute
" = second
°C = degree centigrade
10³ = thousand
10⁶ (mil.) = million
10⁹ = billion (milliard)
ppm = parts per million
pH = scale for acidity

Derived Measures

m³/s = cubic meter per second
kWh = kilowatt hour
MWh = Megawatt hour
kWh/y = kilowatt hour per year
kVA = kilovolt ampere

Time

sec(s) = second
min = minute
h = hour
d = day
y = year

Money

Rp. = Rupiah
US\$ = US dollar
¥ = Japanese Yen

CHAPTER 1

INTRODUCTION

CHAPTER 1 INTRODUCTION

1.1 General Background

Indonesia is an archipelago of 13,667 islands stretching along the equator for about 5,000 km from Northwest Sumatra to Irian Jaya on its southeastern border [Refer to Fig. 2-1]. The national area within its sea boundaries covers more than 4.8 million km² while its land area is 1.9 million km². Java is the fifth largest island of the country with an area of 123,000 km² or 6.9% of the total area of Indonesia. It contains the capital of the nation capital DKI Jakarta, DI Yogyakarta and the three provinces of East, Central and West Java [refer to Annex I(A), Section 1.1].

The total population of Indonesia was estimated at around 163 million in 1985. It grew at a rate of about 2.3% from 1971 through 1980. In its projection, the Central Bureau of Statistics (BPS) forecast that the annual growth rate will decline to 1.9% in 1995-2000 and that the population of Indonesia will reach about 223 million in year 2000.

The distribution of the population in Indonesia is very uneven. Whereas the national population density averaged 86 persons/km² in 1985, it was estimated at 759 persons/km² in Java. Java which covers only 7% of the total land area, contains about 61% or more than 100 million people of the whole nation population.

The national growth rate was 2.32% per annum during the period of 1971-1980. However, owing to the transmigration programmes, the growth rate in Java was 2.02% in the same period.

More than 80% of the population of Java still live in rural areas. The urban population is concentrated in the major cities such as Jakarta, Bandung, Surabaya, and others. The

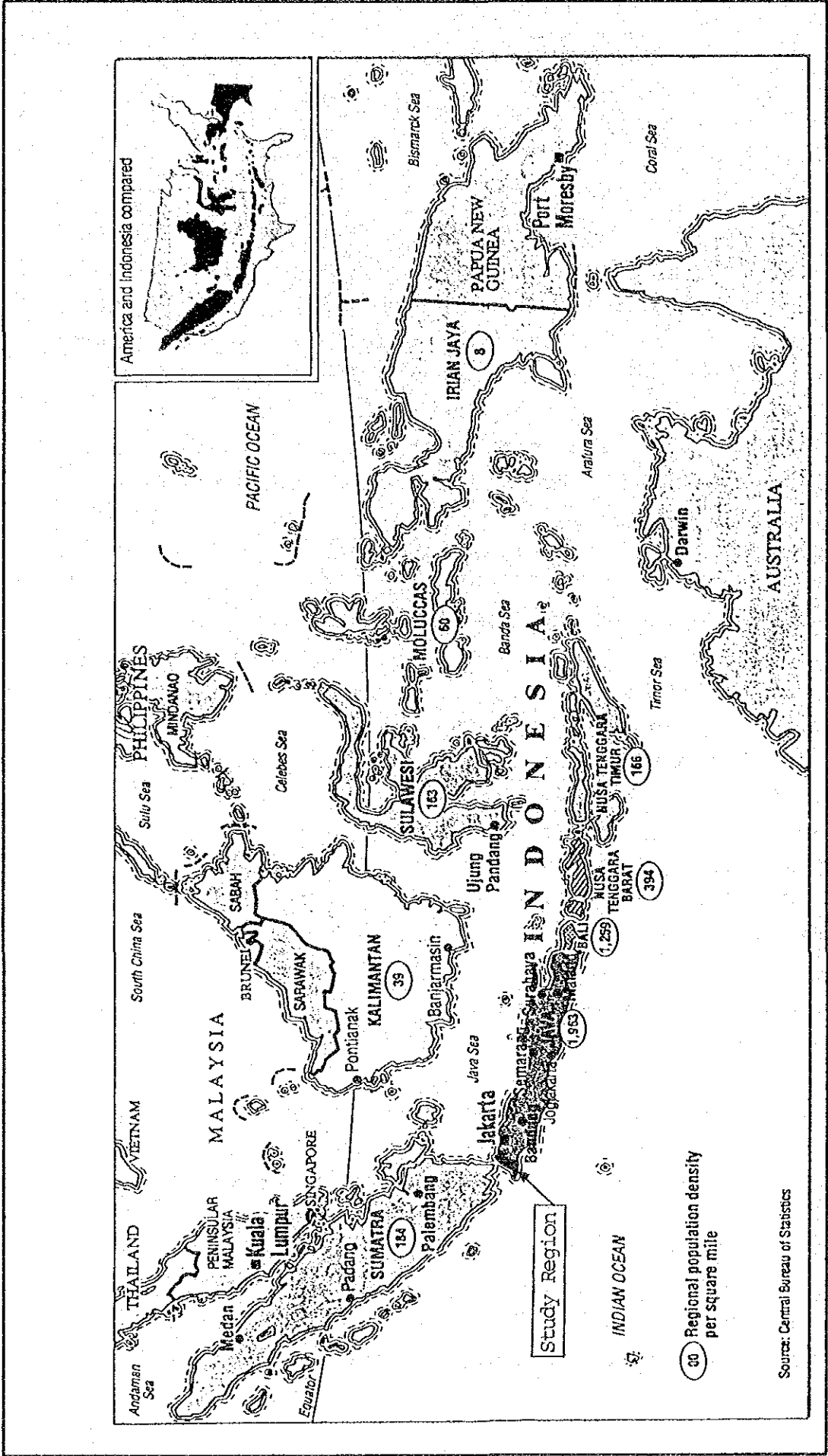


Fig. 1-1
GENERAL LOCATION MAP OF INDONESIA

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

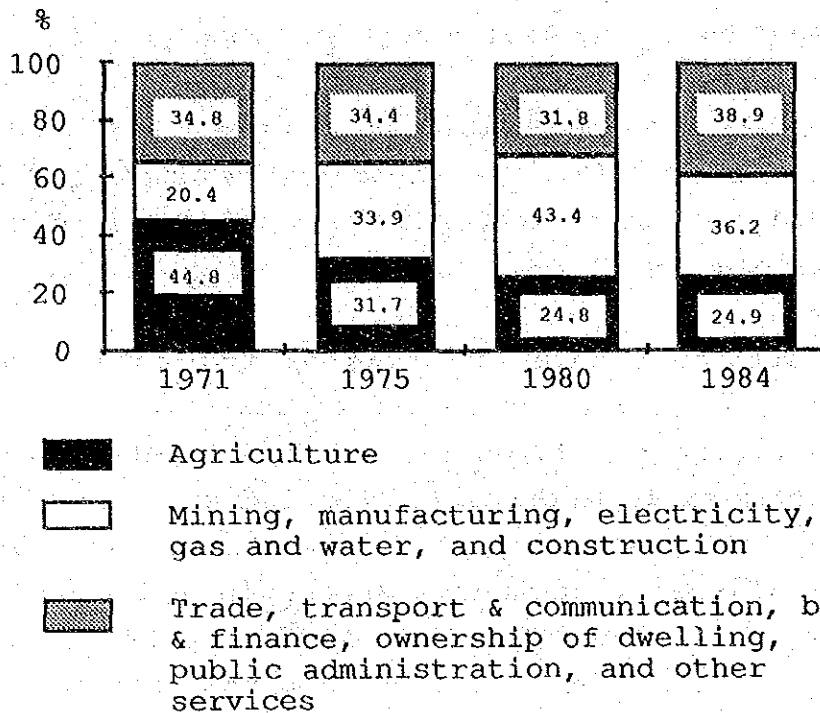
0 Miles 400 800

rapid increase of the working population entering the labor market every year has led to a worsening of employment conditions and the living environment in urban areas.

According to BPS, the population aged 10 and over accounted for 110.4 million in 1982. The economically active population was 59.6 million which corresponds to 54.0% of the population over 10 years old.

About 31.6 million people or 54.7% of the total employed population are still working in the agricultural sector that comprises agriculture, forestry, livestock and fisheries. However, Indonesia is being gradually industrialized from a basically agricultural country. The Gross Domestic Product (GDP) share of the agricultural sector in relation to the whole economy decreased from 44.8% in 1971 to 24.9% in 1984. On the other hand, the share of mining, manufacturing, construction, electricity, gas and water increased from 20.4% to 36.2% and that of the service sector from 34.7% to 39.0% in the same period.

Fig. 1-2 DISTRIBUTION OF GDP BY SECTOR



Source: BPS [Refer to Annex I, Table I(A)-2.]

Such a change in the industrial structure is reflected in the issue of regional and urban development. Urbanization in Indonesia is taking place at a quick pace. Between 1971 and 1980, urban migration from rural areas accounted for slightly more than half of the 9.6 million increase in the Indonesia's urban population. During the same period, the urban population increased by 4.0% per annum compared with a 2.6% increase during the period of 1961-1971. At this pace, Indonesia's urban population will more than double from its 1980 level of 33 million to 72 million by 2000.

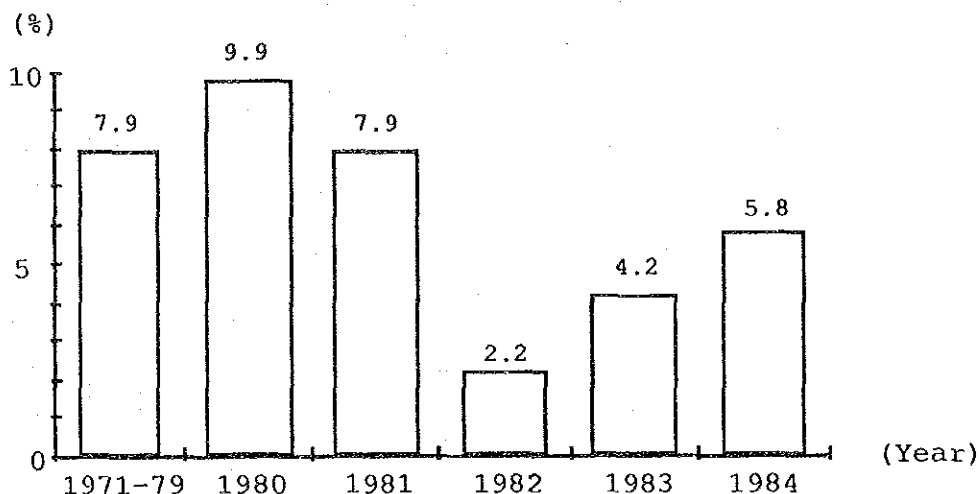
One of the most important features of Indonesia's development lies in rural-urban differences among regions. Due to population pressure, 4.3 million Indonesians or 16% of the natural increase in the population resettled permanently in provinces outside their birth place between 1971 and 1980. Approximately 1.7 million people (or about 40%) moved from Java to other islands in the same period. Of these, one

million were resettled through official transmigration programmes.

Owing to the remarkable achievements of Repelita I, II, and III, the proportion of the population living in poverty declined from 57% to 40% between 1970 and 1980. The reduction in poverty was conspicuous in the outer islands, where poverty incidence was reduced from 43% to 28%. Nevertheless, there still exists outstanding problems in redistribution of incomes and alleviating regional socio-economic disparities.

The economy of Indonesia performed well during the decade to 1981. GDP expanded at an average annual rate of 8.1% in this period of sustained growth. But overall economic growth slowed down in 1982 and after due to deterioration of the world economy. GDP growth rate of Indonesia at constant prices averaged 7.9% during the period of 1971-79; in 1980 it grew to 9.9%; it then declined to 2.2% in 1982 and rebound to 5.8% in 1984.

Fig. 1-3 GDP GROWTH RATES OF INDONESIA, 1971 - 1984
(% per annum, at constant market prices)



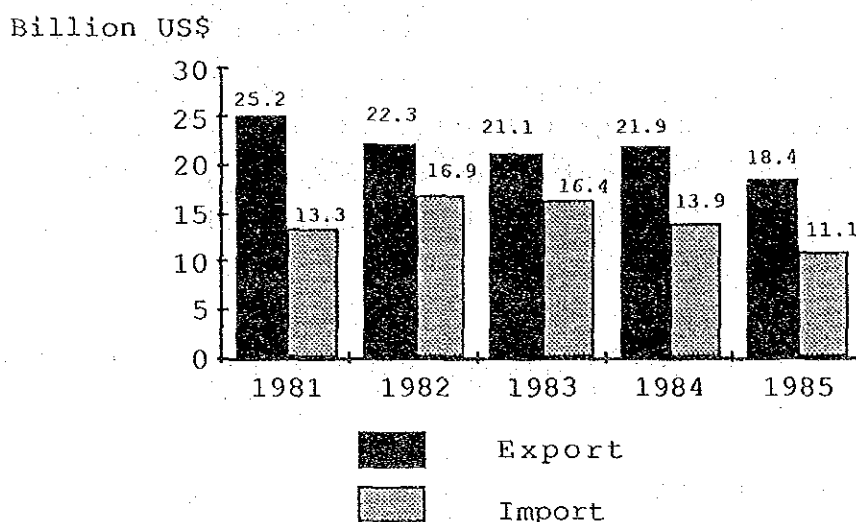
Source: BPS

In 1982, the GDP growth at constant prices recorded the lowest rate of 2.2% in the part 15 years. Real exports declined by 11.3% due to the weakening in demand for petroleum and other

traditional exports such as timber, rubber, coffee, tin ore, and others. On the supply side, the impetus for growth from the agricultural sector was weakened in 1982 by a severe drought.

The worsening of the economy was also reflected in the balance of payments which was adversely affected by the sharp decrease in exports. The bulk of exports went to Asian nations followed by the Americas and EC countries. Indonesia's GDP per capita was estimated at \$566 in 1984.

Fig. 1-4 EXPORT & IMPORT BY VALUE (FOB)



Source: BPS

The current Fourth Five Year Development Plan (Repelita IV) of 1984/85 - 1988/89 is based on the following directives:

- 1) To raise the standards of living, intellectual abilities and general welfare of the people and lay strong foundations for subsequent stages of the nation's development;
- 2) To establish effective foundations for future sustained development, and to create an environment that provides incentives and opportunities for all concerned to

participate and perform, fully and harmoniously, in the national development effort;

- 3) To continue to give priority to economic development with emphasis on agricultural self-sufficiency in food, and on industry, at the same time giving more attention to social development and the development in other non-economic fields;
- 4) To continue to be based on the "Trilogi Pembangunan" or the Development Trilogy, namely equity, a sufficiently high rate of economic growth, and a sound and dynamic national stability.

The indications are that the strategy under Repelita IV remains fundamentally unchanged from the one under Repelita III (1979/80-1983/84) but with greater emphasis on equitable development. While the priority of Repelita IV is still economic development, greater emphasis is given to human resource development comprising education, health, manpower, clean water supply, nutrition, housing and human settlement, as represented in the sectorial percentage breakdown of the development budget. The education and youth affairs' budget increased from 10.4% to 14.7%, while the budget for transport and tourism declined from 15.5% to 12.6% although there are recent indications to show that this situation will be remedied.

In its 4th Five-Year National Development Plan (Repelita IV), the Government of Indonesia has put emphasis on a gradual approach to development with a view to improving the living, educational and social conditions of the population by establishing a firm foundation for their undertaking in the present plan period. Although importance has been attached to further improving the agricultural sector, the need has arisen to diversify the source of foreign income by developing tourism to counter the decline in crude oil receipts.

In this context, the Government of Indonesia, in June 1985, requested the Government of Japan to extend its international cooperation to realize a master plan and an implementation plan for tourism development in the western part of West Java.

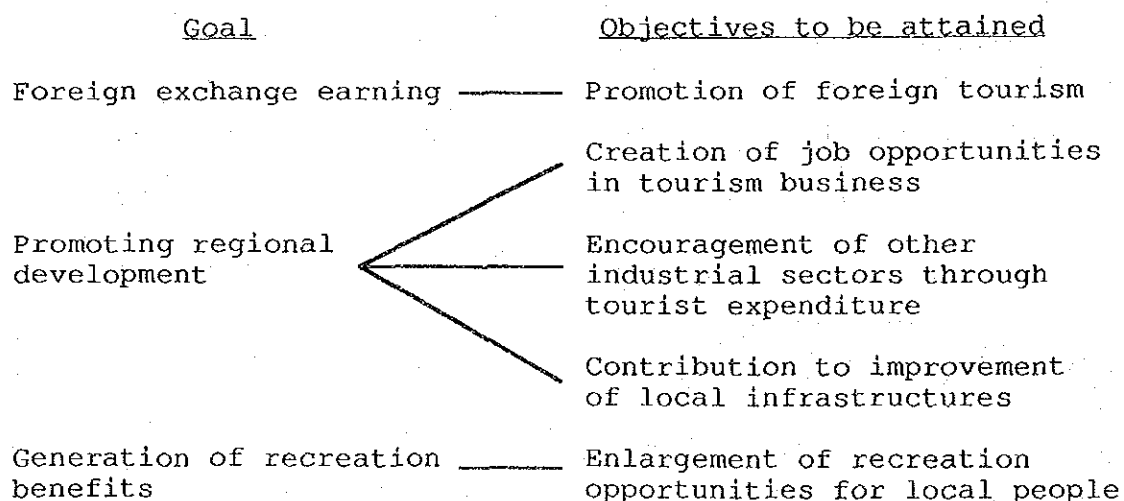
1.2 The Objectives

The Government of Indonesia has put emphasis on the development of the western part of West Java as the area is comparatively behind in tourism development as compared with other areas.

In this connection, this study is expected to formulate a master plan presenting an effective approach for the following three ultimate goals:

- Foreign exchange earning;
- Promoting regional development;
- Generating recreational benefits.

In order to reach these goals, it needs to attain the below objectives, to the full extent, within the target year (2010).



1.3 Activities of JICA Study Team

The Government of Indonesia and the Government of Japan signed an Agreement in May 1986 on the Scope of Work for the study, and the Japan International Cooperation Agency (JICA) dispatched a Study Team to Indonesia during the period from August 1986 to September 1987 to undertake the study.

The first JICA Study Team of 10 members stayed in Indonesia from August to December 1986. In the meantime, the JICA Study Team submitted a Progress Report in October 1986. The Progress Report contains analyses of existing conditions and clarification of problems of the study region, evaluation of a development potentials and setting of development frame. The JICA Study Team left Jakarta at the end of December 1986.

The second JICA Study Team of 7 members stayed in Indonesia for two months in February and March 1987 to complete Phase I of the study. The Interim report I containing formulation of the regional development framework was submitted at the end of February. It was discussed by the Indonesian Steering Committee whose members provided useful comments for subsequent studies.

The third JICA Study Team composed of 8 members was dispatched in July and stayed until the end of September 1987. The JICA Study Team submitted Interim Report II which contains the selection of proposed project sites, priority projects and parts of the implementation programme. It was thoroughly discussed by the Indonesian Steering Committee members who accepted the recommendations of JICA Study Team contained in the report.

Formulation of the Draft Final Report was realized after completion of field surveys by the third JICA Study Team. Although its formulation was made in Japan, members of the team kept close contacts with Indonesian counterparts, and DGT through correspondence and telecommunication to reflect the

views of the Indonesian side in the contents of the Draft Final Report.

The Draft Final Report was sent to Indonesia before the end of November 1987 to allow time for Steering Committee Members to go over the reports. Four members of the JICA Study Team and JICA Advisory Committee members went to Jakarta in December to attend the Steering Committee Meeting which was held on 10 December 1987 to discuss on the Draft Final Report. Minutes of the meeting was signed between the Director General of DGT and leader of the JICA Study Team to incorporate Indonesian side's comments and requests.

The Final Report was prepared by updating figures from recently available data, providing more descriptions and explanations on parts necessary comments and views of Steering Committee members.

Throughout its stay in Indonesia, Indonesian counterparts led by Ms. Myra P. Gunawan cooperated and assisted the JICA Study Team in all phases of its field survey and study. While the JICA Study Team was preparing its reports in Japan, Ms. Myra P. Gunawan visited Japan in March-April 1987 to provide the team with useful comments and advice on the report formulation.

Related personnel and counterparts are as follows:

INDONESIAN STEERING COMMITTEE

(Name)	(Title or Position)
1) Joop Ave	: Director General of DGT
2) Drs. Andi Mappisammeng	: Executive Secretary of DGT
3) Drs. Ateng Syafruddin	: Head of Regional Development Planning Agency (BAPPEDA Tk. I) of West Java
4) W.J. Pranoto	: Head of Planning Division of DGT
5) Ir. D. Sinulingga	: Head of Planning Bureau of Dept. of Tourism, Post & Telecommunication

- 6) Drs. Hari Hartono (Alm.) : Head of Research & Development Bureau of Dept. of Tourism, Post & Telecommunication
- 7) Drs. Uka Tjandrasasmita : (Ditlinbin Jarah: Direktur Perlindungan Peninggalan Bersejarah dan Purbakala)
Director of Directorate of Protection & Management of Historical Remains/Relics and Archeology, Directorate General of Culture
- 8) Ir. Aca Sugandhi, MSc : Assistant to the State Minister of for Population and Environment Affairs, Lay-out (Tata Ruang) Quality Management Section
- 9) Drs. Ilchaidi Ilyas : Dept. of Industry
- 10) Ir. Suyono, Msc. : Director of City & Regional Planning, Dept. of Public Works, Directorate General of Cipta Karya
- 11) Ir. Rahardjo Notosaputro : Director of Programming, Directorate General of Irrigation, Dept. of Public Works
- 12) Ir. P. Simatupang : Head of Communication & Tourism Bureau, The National Development Planning Agency (BAPPENAS)
- 13) Ir. Sujadi Hartono : Director of National Park and Recreational Forest, Directorate General of Forest Protection & Nature Conservation, Dept. of Forestry
- 14) Drs. H. Syofyan Nasution : Directorate General of Regional Planning, Dept. of Home Affairs
- 15) Drs. Syahrul Gani : Central Bureau of Statistics
- 16) Surastomo SH : Director of Directorate of Traffic and Road Transportation (LLAJR), Directorate General of Land Transportation
- 17) H. T. Sumarna : Bupati of Serang
- 18) Drs. H. Sujaman : Bupati of Pandeglang
- 19) Drs. H. Hanafi : Head of Regional Office VI of Tourism, Post & Telecommunication of West Java Province
- 20) Dra. Cri Murthi Adi : Director of Directorate of Tourism Marketing, Directorate General of Tourism
- 21) Drh. Julham Muslichun : Director of Directorate of Accommodation and Various Tourism, Directorate General of Tourism
- 22) Drs. Sugardjito Broto : Director of Directorate of Travel Agencies, Directorate General of Tourism

- 23) Ir. A. Syamsudin : Director of Directorate of Convention & International Relation, Directorate General of Tourism
- 24) Ir. Sjarif Puradimaja : Directorate General of Public Affairs & Local Autonomy, Dept. of Home Affairs
- 25) Drs. Baginda Sinurat : Head of Education & Training Center, Dept. of Tourism, Post & Telecommunication

COUNTERPARTS MEMBERS

- | (Name) | (Organization and Title) |
|---------------------------------|--|
| 1) Prof.Dr. Sugiyanto Soegijoko | : ITB |
| 2) Ir. Myra P. Gunawan | : ITB |
| 3) Ir. Roos Akbar | : ITB |
| 4) Ir. Heru Purboyo | : ITB |
| 5) Ir. Holiqurrahman | : ITB |
| 6) Ir. Syafkhardi | : ITB |
| 7) Ir. Benny Camil | : ITB |
| 8) It. Mochtarram Karyoedi | : ITB |
| 9) Ir. Budi Permadi | : ITB |
| 10) Drs. Sugiharto | : ITB |
| 11) Ir. Sambujo Parikesit | : Head of Planning Division of Regional Office VI of Dept. of Tourism, Post & Telecommunication of West Java |
| 12) Ir. George Oemint | : DGT (Head of Tourism Planning & Programming Sub-Division, Planning Division) |
| 13) Ir. Tantie Kustantia | : DGT |
| 14) Drs. Wardiyatmo | : DGT |
| 15) Drs. Udin Sjaifudin | : DGT (Head of Marketing Material Sub-Division, Directorate of Tourism Marketing) |
| 16) Drs. Maryatmo | : DGT (Head of Cultural and Natural Tourist Attraction, Directorate of Travel Agencies) |
| 17) R. Achmad | : DGT |

JAPANESE ADVISORY COMMITTEE

	(Name)	(Organization and Title)
1)	Prof. MORISUGI Hisayoshi (Chairman)	Gifu University
2)	Mr. OTAKE Akira	MOT
3)	Mr. INOUE Junichi	MOT
4)	Mr. SHIRAISHI Nobuaki	MOT
5)	Mr. SATO Tetsuya	JNTO

JICA COORDINATORS & ADVISOR

	(Name)	(Organization)
1)	Mr. KAWAI Atsushi	JICA
2)	Mr. TAKAHASHI Toshiharu	JICA
3)	Mr. SHIBATA Satoshi	MOT

JICA STUDY TEAM

	(Name)	(Title or Position)
1)	Mr. ODA Chikashi	Team Leader
2)	Mr. FURUICHI Fumihiko	Regional Planner
3)	Mr. OOHASHI Hideo	Regional Economist
4)	Mr. SATO Shigeichi	Industrial Promotion Planner
5)	Mr. MITA Ikuo	Tourism Promotion/Operation & Management Planner
6)	Mr. KAI Shigeo	Specialist on Tourism Demand Forecast
7)	Mr. KOJIMA Masashi	Tourism Site Planner
8)	Mr. ASAKURA Isamu	Infrastructure Planner
9)	Mr. HIROTANI Akihiko	Transport and Communication Planner
10)	Mr. KIKUCHI Takenori	Tourism Physical Planner
11)	Mr. NAITO Toshiki	Execution Planner
12)	Mr. MASUDA Yuzaburo	Management Planner
13)	Mr. YANAGISAWA Kenichro	Economic and Financial Analyst
14)	Mr. KODA Yuichi	Environmentalist

1.4 Organization of the Report

The final report is prepared in 5 volumes, namely: Volume 1: Executive Summary, Volume 2: Main Report of Master Plan, Volume 3: Annexes of Master Plan, Volume 4: Main Report of Implementation Programme, Volume 5: Annexes of Implementation Programme.

The Master Plan (Main Report) of Volume 2 contains Conclusions and Recommendations in seven chapters. The Introduction in Chapter 1 shows the background and objectives of the study as well as the activities of the JICA Study Team. The outline of the study region is explained in Chapter 2 which provides the background of the study region with its natural conditions. It also explains the socio-economic and cultural conditions as well as its infrastructures and land system. Chapter 3 deals with aspects of tourism (worldwide, regional and national), as well as with the conditions of tourism in the study region.

In Chapter 4, the direction of regional development with its potentials and strategy is explained. Chapter 5 deals with the framework of the socio-economy as well as the tourism aspects of the study region. Chapter 6 contains the development concept of tourism and the long-range development perspective. It describes the proposed projects within the framework of the master development programme in the study region. It also considers the environmental aspects and institutional arrangements for the proposed projects. Lastly Chapter 7 discusses the optimum stage plan and priority projects by analyzing various alternatives, and provides recommendations on the best stage programme of the priority projects.

Main Report of the Master Plan (Vol. 3) is supplemented with six annexes which contain more detailed information, figures and tables on subjects mentioned in the main report. They are:

- Annex I (A) Socio-Economy,
- Annex I (B) Infrastructure,
- Annex I (C) Regional Development,
- Annex I (D) Conditions of Tourism,
- Annex I (E) Tourism Demand and Planning, and
- Annex I (F) Environment Aspect

1.5 Acknowledgement

The JICA Study Team expresses its deep appreciation for the encouragement and cooperation it has received from the numerous Indonesian agencies, government as well as private, and from many individuals of these agencies. Special thanks are addressed to Dr. Ateng Syafruddin, Head of the Regional Development Planning Agency (BAPPEDA Tk I) who has taken times to receive the JICA Study Team and attended several Steering Committee meeting and also to the energetic Director General of DGT, Mr. Joop Ave, for their support and continued interest in the progress of the study.

The JICA Study Team is particularly indebted to the personnel of DGT and counterparts provided by DGT for their continued support and cooperation. Our thanks go to Drs. Andi Mappisammeng, the able Executive Secretary of DGT, Mr. W.J. Pranoto, Head of Planning Division of DGT, and his staff, Ms. Myra P. Gunawan, Coordinator of the counterpart team and his colleagues, as well as to all members of the Indonesian Steering Committee members, to officials of Kab. Serang and Pandeglang, to officials of the Regional offices in Bandung and Bogor, and also to all other personalities we have met in the course of our study.

The JICA Study Team extends also its thanks to the Japanese Government through the Ministry of Foreign Affairs, Ministry of Transport, Japan International Cooperation Agency, Japanese Embassy and JICA office in Jakarta and to JICA Advisory Committee for their support and help.

CHAPTER 2

OUTLINE OF THE STUDY REGION

CHAPTER 2 OUTLINE OF STUDY REGION

2.1. The Background

The study region delineated in the agreed Scope of Work involves the two Kabupatens of Serang and Pandeglang, and includes the Krakatau Islands of Kab. Lampung Selatan in Sumatra. It is located in the westernmost part of West Java and is bordered by the Java Sea in the north, the Sunda Straits in the west, the Indian Ocean in the south and by the boundaries of Kabupatens Tangerang and Lebak [refer to Annex I(A), Chapter 2].

Kab. Serang is located in the northern part of the Banten region and is rapidly developing as an industrial area, particularly around Cilegon and Merak. Serang, the capital town of Kab. Serang is also the capital town of the Tourism Region I of Banten.

Tourism objects abound in Kab. Serang in the form of cultural, historic and archaeological assets, art and culture, sandy beaches, hot springs and nature reserves.

Kab. Pandeglang is one of the regencies in Banten area. It possesses a number of tourism assets such as the Ujung Kulon National Park known as the habitat of the rare one-horned rhinoceros. There are sandy beaches, natural lakes and hot springs etc. Kab. Pandeglang possesses many traditional arts and inscribed and sculptured stones. Many traditional and religious festivals are held in the regency.

The Krakatau islands consist of 4 islands in the Sunda Straits. A former volcano erupted explosively one hundred years ago, resulting in its own destruction. As it caved in and sunk into the sea bed it formed a submarine caldera.

In 1927, Krakatau erupted again and a new island arose from the sea which was named Anak Krakatau (Son of Krakatau). Another eruption occurred in 1952 that pushed Anak Krakatau to a height of 150 m, and further small eruptions occur from time to time.

2.2 Natural Conditions

2.2.1 Topography

The topography of the study region is rather complicated. It is flat in the northern corner and hilly to mountainous in the rest of the study region. The highest peak is Gunung Karang at an elevation of 1,776 m. Other mountains range from 600 m to 1,300 m. Relatively low mountains from 200 m to 600 m are found in the southwestern part of the study region.

2.2.2 Hydrography

Most rivers in the study region may be categorized into two types: rivers draining generally from south to north into the Java Sea, and rivers flowing from east to west into the Sunda Straits. In the northern part, rivers flowing into the Java Sea are the Cidurian, Ciujung and Cibanten rivers. Rivers flowing into the Sunda Straits are the Kali Anyer, Cidanau, Citajur, Cibungur, Ciliman and Ciseukeut rivers. The Cibaliung river flows into the Indian Ocean.

2.2.3 Climate

The precipitation in the study region averages about 2,500 mm per annum. Annual rainfall varies according to location and topography from about 1,500 mm in the northern coastal plain to about 5,000 mm in the southern mountainous region. The monthly air temperature varies little throughout the year between 26°C and 27°C while the relative humidity ranges from 80% to 85%.

2.2.4 Flora and Fauna

The Republic of Indonesia has the vast area consisting of thousands of islands which are widely distributed from in Sumatra the west to in Irian-Jaya the east. The composition of the Indonesian flora and fauna is very specific and unique. In Sumatra, Kalimantan and other islands on the Sunda Shelf, they are generally influenced by the Asian Continent, whereas east of the so-called Wallace Line such as in Maluku, Nusa Tenggara and Irian-Jaya are influenced by the Australasian Continent. The island of Sulawesi is influenced by Asian as well as Australasian, so that the flora and fauna in this region present Unique Characteristics. Therefore, in Indonesia there exist a large number of endemic and precious of flora and fauna, of which much of the latter is of considerable social and economic importance, both existing and potential [refer to Annex I(F), Chapter 1].

The study region being located in the western part of Java island has fauna and flora which are influenced by the Asian Continent. In the study region, there are many National Parks, Nature Reserves and Tourism Forests. Ujung Kulon National Park in the westernmost extension of Java is famous as the last place in the world where the once common Javan rhinoceros is found. It is now a Biosphere Reserve and a World heritage Site.

2.2.5 Oceanography

1) Surface current

In the Sunda straits, water movements are in general directed towards the Indian Ocean and are strongly related to the surface gradient of the sea level. The sea level in Tanjung Priok of Jakarta is 10 - 40 cm higher than in Pelabuhan Ratu facing the Indian Ocean.

The velocity of the surface current in the Sunda Straits reaches its maximum in August when the wind from the north is the strongest.

The mean velocity is 0.4 m/s (1.4 km/h) and the maximum is approximately 1.2 m/s (4.4 km/h) in that season.

2) Wave Height

Wave heights in the Sunda Straits are lower than in the Indian Ocean. In west wind season from December to March, the average wave height in Sunda Straits is 0.5 - 1.25 m. In east wind season (May - October), the average wave height is 0.5 - 1.0 m. High waves over 2.5 m can be seen only a few times a year.

2.3 Socio-Economy

2.3.1 Administration

The study region is defined by the jurisdiction of the two Kabupatens of Serang and Pandeglang, together with the Krakatau Islands which belong to Kab. Lampung Selatan in Sumatra.

The region covers a land area of 4,520 km², comprising 1,876 km² for Serang, 2,609 km² for Pandeglang and 35 km² for the Krakatau Islands. This is nearly 10% of the gross area of the West Java Province (to be called hereinafter "West Java").

The administrative units of the study region consist of 26 Kecamatans and 412 Desas/Kelurahans in Kab. Serang and 16 the Kecamatans and 334 Desas/Kelurahans in Kab. Pandeglang. Krakatau Islands belong to Kecamatan Kalianda of Kab. Lampung Selatan of Lampung Province in Sumatra.

2.3.2 Population

Population censuses in Indonesia were carried out in the years 1961, 1971 and 1980 after independence.

In 1985, the study region supported a population of some 1,893 thousand consisting of 1,166 thousand in Kab. Serang and 727 thousand in Kab. Pandeglang. The Krakatau Islands are uninhabited. The population in the study region is about 6.6% of the total Province.

The population in the study region is unevenly distributed due to its topography, being dense in the northern and eastern parts and sparse in the southern and western areas. The distribution of the population in the study region is as follows.

- 1) The majority of the population is concentrated in the municipalities along the national, provincial and local roads from Serang to Merak through Cilegon and from Serang to Pandeglang;
- 2) Agglomerated populations are found in the towns located in the coastal areas (Banten, Labuan, Carita, Anyer, etc.) equipped with some harbor or tourism facilities;
- 3) Inhabitants are sparse in the southern and western parts such as on the outskirts of Rawa Danau on the caldera, and those parts the study region covered with mountains, forests and swamps.

The population density in the study region was about 416 persons/km² in 1984. This figure is lower than in the Province as a whole (610) and in the whole of Java (747). The Population density in Kab. Serang in 1984 was 617 persons/km² and that in Kab. Pandeglang 273 persons/km², as shown in Table 2-1. Figures in this table indicate an accelerated

Table 2-1 POPULATION DATA

	Area (km ²)	Population Census			Growth Rate (%)			Population Density in 1984 (Persons/km ²)	
		1971		1980	1961-71		1971-80		1981-84
		1961							
1. Indonesia	1,919,443	97,085,348	119,208,229	147,490,298	2.10	2.32	2.30	84	
2. Java	132,187	63,059,575	76,086,327	91,269,528	1.19	2.02	1.97	747	
3. DKI Jakarta	590	2,906,533	4,576,009	6,503,227	4.46	3.93	4.59	12,712	
4. West Java	46,300	17,614,555	21,623,529	27,449,840	2.09	2.66	0.93	610	
5. Study Region	4,512	1,160,382	1,432,095	1,803,945	2.13	2.60	1.01	416	
- Kab. Serang	1,876	720,169	859,467	1,109,186	1.80	2.65	1.09	617	
- Kab. Pandeglang	2,636	440,213	572,628	694,759	2.69	2.15	0.88	273	

Source: BPS (Refer to Annex Tables I(A)-18 and I(A)-19.)

urbanization in the study region, especially around the five cities: Serang, Pandeglang, Banten, Merak and Cilegon.

The average growth rate based on resident registration in the study region was 1.01% per annum during the period from 1981 to 1984, implying an outflow of the population to outside. This percentage is fairly small compared with 4.59% of DKI Jakarta, 1.9% of Java and 2.30% of the country.

After independence, transmigration has been promoted by the government to other islands of Indonesia. This has been under the responsibility of the Department of Manpower, Transmigration and Cooperation. Since reorganization in April 1983, the Department of Transmigration has been undertaking this program.

The objectives of transmigration programs have been the following:

- 1) enhancing living standards,
- 2) regional development,
- 3) balanced population distribution,
- 4) development equity,
- 5) utilization of natural resources and human resources,
- 6) national unity, and
- 7) strengthening of security and defense.

Java Island is the biggest producer of migrants. But it differs province by province [refer to Table I(A)-11]. Among five provinces, the net annual migration in two provinces: Central Java and East Java indicate minuses, i.e. -0.7% to the total population for the former and -0.26% for the latter. This means that in those provinces, there more people departing than entering. In case of West Java, net migration has been 0.03%. This might be due to the remarkable expansion of the urban population in the northern part of the region, even though the rural areas of the Province are producing many migrants to the neighbouring provinces and outer islands.

Numbers of settled households and transmigrants from the study region were 2,157 and 6,321 in 1984/85. Transmigrants of the region are all settled in two provinces: Sumatra (75.4%) and Kalimantan (24.6%). Most of transmigrants entered into Aceh (41.9%), South Sumatra (18.2%) and West Kalimantan (17.7%). Based on the data and information obtained from transmigration offices in Serang and Pandeglang, transmigration mass-producing areas in the study region are Kec. Padarincang, Cinangka, Mancak and Pabuaran (adjacent areas to Rawa Danau) in Kab. Serang and central Kecamatans of Kab. Pandeglang including Pagelaran, Saketi, Cigeulis (Panimbang), Munjul (Angsana) and Jiput [refer to Annex Table I(A)-12 and I(A)-13].

In these areas, arable lands are strictly limited because of the existence of natural reserve areas and national and private plantations. As the situation now stands, the transmigration from these areas has to be intensified in proportion to population growth, if the Government does not change the present land use policy, and especially agro- and aqua-industries, which are labour-intensive, are actively promoted.

2.3.3 GRDP and regional income

The figures for GRDP (Gross Regional Domestic Product) and regional income in the study region are not available. Therefore, Table 2-2 shows the GRDP of Banten Region, consisting of Kab. Serang, Kab. Pandeglang and Kab. Lebak, in comparison with GRDP of West Java Province and DKI Jakarta and GDP of Indonesia [as for GRDP in Banten Region, refer to Annex Tables I(A)-13, I(A)-14 and I(A)-15].

Table 2-2 GDP OF INDONESIA AND GRDP OF DKI JAKARTA, WEST JAVA AND BANTEN REGION AT CURRENT PRICES, 1970 - 1983

Unit: Rp. million

	1980	1981	1982	1983
1. Indonesia	45,446,000	54,027,000	59,633,000	73,698,000
2. DKI Jakarta	3,988,071	5,190,211	5,920,673	7,192,670
3. West Java	5,651,547	6,938,506	7,757,757	9,185,893
4. Banten Region /1	318,809	432,360	502,677	781,334 /2

Remarks: /1 Banten Region consists of Kab. Serang, Kab. Pandeglang and Kab. Lebak
 /2 Updated

Source: Statistic Indonesia 1985

GRDP of Banten Region amounted to Rp. 781 billion in 1983 at current prices. The GRDP average growth rate of Banten Region at 1975 constant prices was 8.7% per annum during the period from 1978 to 1983. This figure is higher than 7.8% of West Java Province and 6.1% of Indonesia, but lower than 11.3% of DKI Jakarta.

Table 2-3 indicates the share of GRDP by industrial origin for Banten Region. In Banten Region, the share of agricultural sector shows a decreasing tendency from 51.5% in 1975 to 31.9% in 1983. The latter share is much higher than 24.2% of West Java and 24.0% of the country. Such a decreasing tendency of the GRDP share in agricultural sector in Banten Region implies the reducing labor force in this sector and rural-urban migration.

The per capita income, which means GRDP per capita here, for Banten Region and Kab. Pandeglang was respectively Rp. 225,691 and Rp. 181,552 in 1983 at current prices. These amounts are smaller than Rp. 311,932 of provincial level and Rp. 466,198 of national level, and remarkably small compared with Rp. 1,008,902 of DKI Jakarta.

Table 2-3 GRDP BY INDUSTRIAL ORIGIN OF BANTEN REGION
IN 1973 AND 1983

Unit: Rp. million (%)

	1975		1983	
- Agriculture	58,792.68	(51.5)	191,520.05	(24.5)
- Mining & Quarrying	489.17	(0.4)	5,954.90	(0.8)
- Manufacturing	2,825.11	(2.5)	52,993.06	(6.8)
- Electricity, Gas & Water	182.21	(0.2)	1,430.81	(0.2)
- Construction	3,113.10	(2.7)	96,325.25	(12.3)
- Trade	26,025.01	(22.8)	108,607.56	(13.9)
- Transport & Communications	4,321.17	(3.8)	32,267.30	(4.1)
- Banking & Finance	434.90	(0.4)	4,063.14	(0.5)
- Others	18,110.18	(15.7)	288,171.80 /1	(36.9)
Total	114,293.53	(100.0)	781,333.87 /1	(100.0)

Sources: Produk Domestik Regional Bruto Propinsi Jawa Barat, 1973 - 1979;
Produk Domestik Regional Bruto menurut Wilayah Pembangunan Propinsi DT. I Jawa Barat, 1979 - 83.

/1 Updated figures

The average annual growth rates of the per capita income at current prices were 20.7% for Banten Region and 12.4% for Pandeglang during the period 1978 to 1983. The former is relatively high as compared to 23.6% of the whole country 21.9% of the West Java Province and 25% of DKI Jakarta. The rate of Kab. Pandeglang, 12.4% is still far behind the national and regional levels.

Such a high growth of income in the Banten Region seems to be mainly the result of the enhancing effects of industrialization in the northwestern part of the study region.

2.3.4 Agriculture

Agricultural production represents the main economic activity in the study region. The three Kabupatens of Serang, Pandeglang and Lebak provided 33.6% of GRDP of the Banten area in 1984. Agricultural production includes mainly food crops with other products as plantation crops, vegetables and fruits.

Food crops in the study region consist of paddy (wet and dry land), maize, cassava, sweet potatoes, groundnuts, soyabeans and so on. The principal food crops and their production in 1984 were as shown in Fig. 2-1 and Table 2-4.

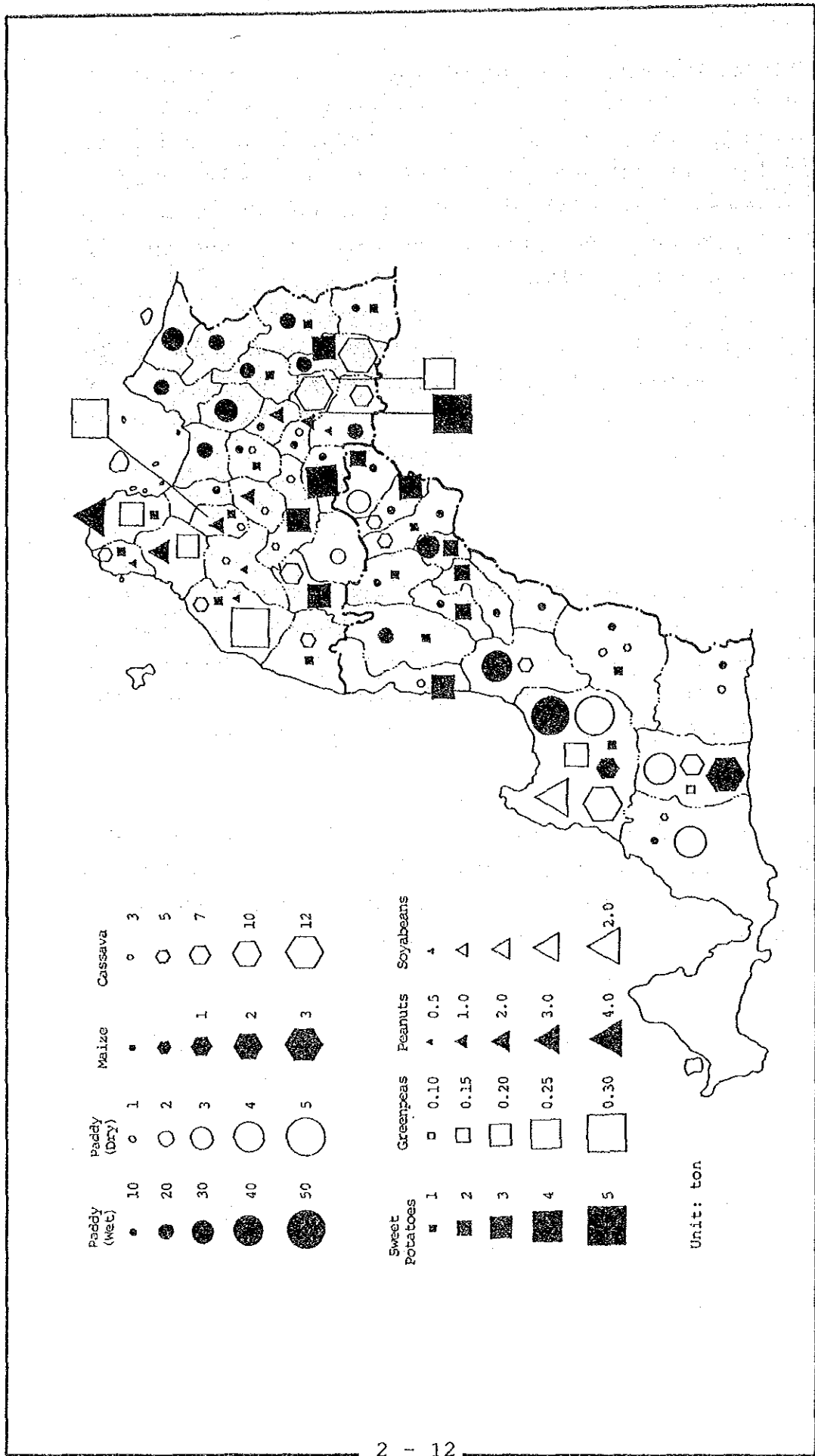


Fig. 2-1
 FOOD CROP PRODUCTION IN THE
 STUDY REGION, 1985

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

Sources: Dinas Pertanian Tanaman Pangan
 Serang, Laporan Tahun 1985;
 Dinas Pertanian Tanaman Pangan
 Pandegrag, Laporan Tahun 1985.

Table 2-4 PRINCIPAL FOOD CROPS IN THE STUDY REGION

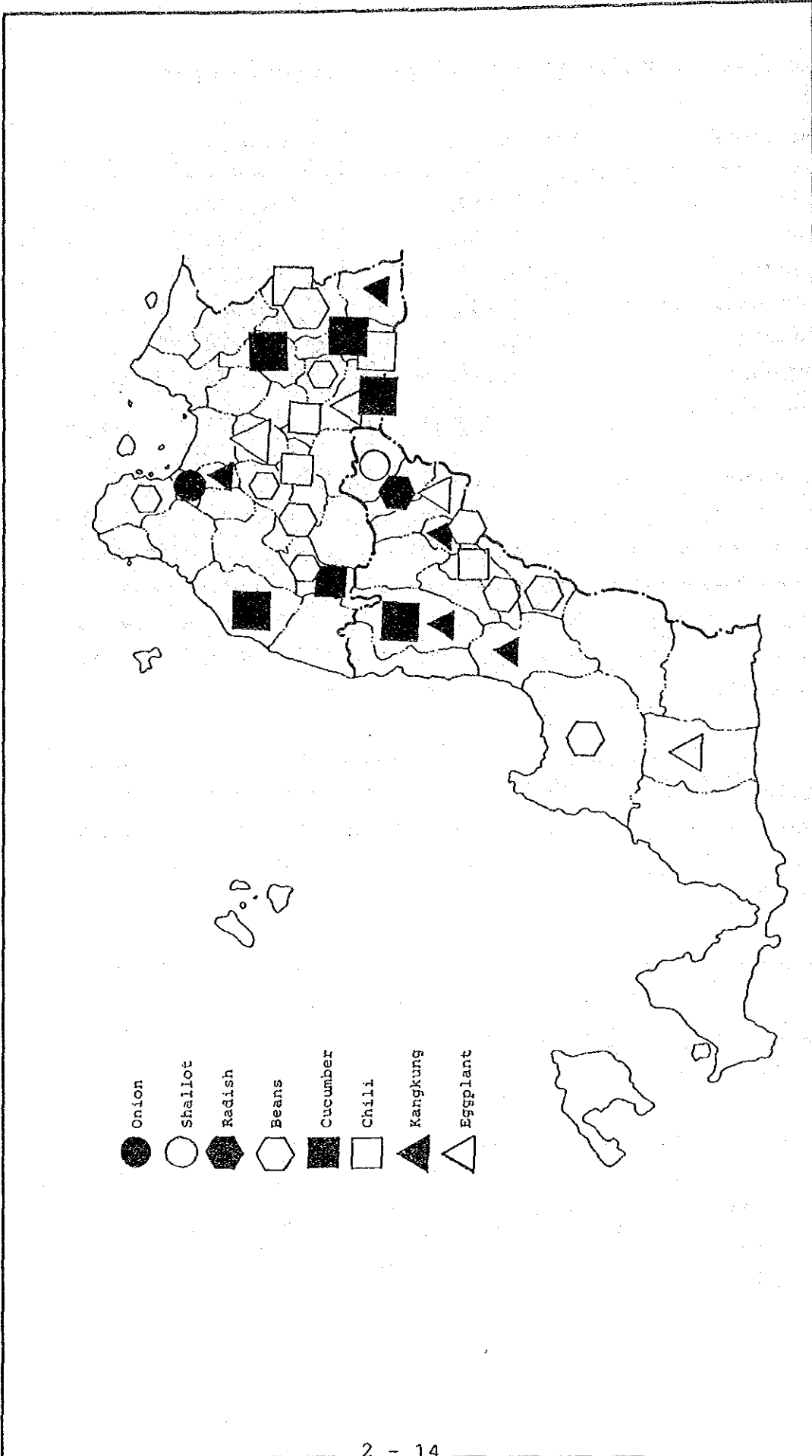
Food crops	Planted area (ha)	Production (ton)
Paddy	152,594	602,188
Maize	6,361	8,890
Cassava	13,562	161,330
Sweet potatoes	5,432	48,922
Groundnuts	18,369	15,949
Soyabeans	2,619	2,189
Greenpeas	3,493	264

The main vegetables produced in the study region are beans, cucumber, chili, egg plant, kangkung, and others. Production of cucumber accounted for 25.4% of that of West Java Province. Most of the vegetables are produced along the main roads in the study region. Amongst these in 1985 were beans (22,076 tons), cucumber (19,398 tons), and chili (19,633 tons) [see Fig. 2-2].

The main fruits produced in the study region are durian, duku, jambu, salak, sawo and others. In 1984, the production of jambu and salak represented more than 40% of West Java production. Most of the fruits are produced in Kab. Pandeglang [see Fig. 2-3].

The production of durian in 1985 was 1,856 tons, jambu biji 8,351 tons, jambu air 4,031 tons. Fruit production varies widely with weather conditions that is reflected in their prices in the market.

Plantations in the study region are classified as small holder, large private and state owned plantations. Production includes coffee, rubber, coconut, clove, melinjo, Kapok, pepper, screw-pine, vanilla, sugarplum, etc. Tea production is quite small.



Sources: Dinas Pertanian Tanaman Pangan
 Serang, Laporan Tahun 1985;
 Dinas Pertanian Tanaman Pangan
 Pandeglang, Laporan Tahun 1985.


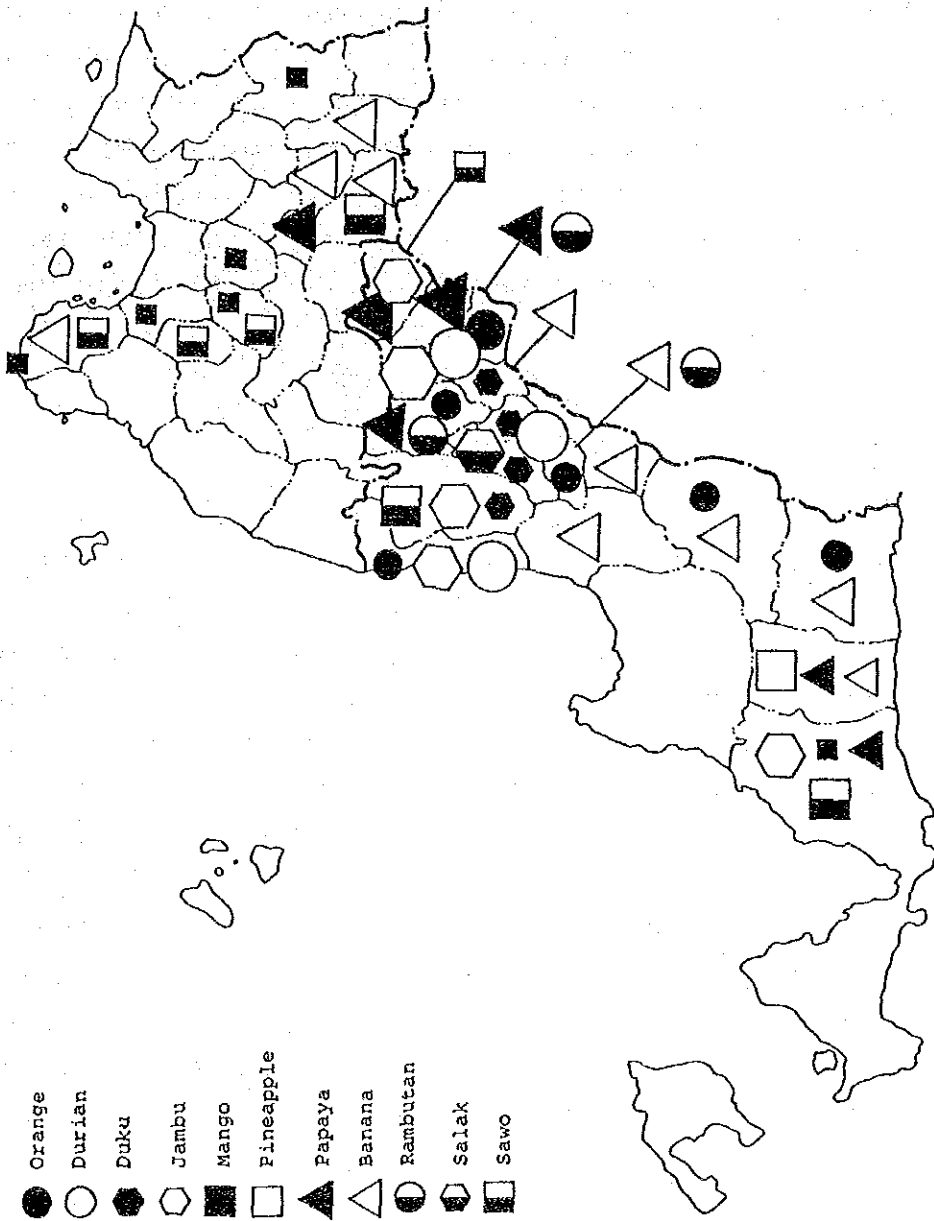

 DEPARTMENT OF TOURISM, POST AND TELECOMMUNICATION
 DIRECTORATE GENERAL OF TOURISM
 JAPAN INTERNATIONAL COOPERATION AGENCY
 THE STUDY ON THE REGIONAL DEVELOPMENT PROJECT
 IN THE WESTERN PART OF JAVA

Fig. 2-2
 VEGETABLE PRODUCTION IN
 THE STUDY REGION, 1985



- Orange
- Durian
- ◐ Duku
- ◑ Jambu
- ◒ Mango
- ◓ Pineapple
- ▲ Papaya
- △ Banana
- ◐ Rambutan
- ◑ Salak
- ◒ Sawo

Fig. 2-3
FRUITS PRODUCTION 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

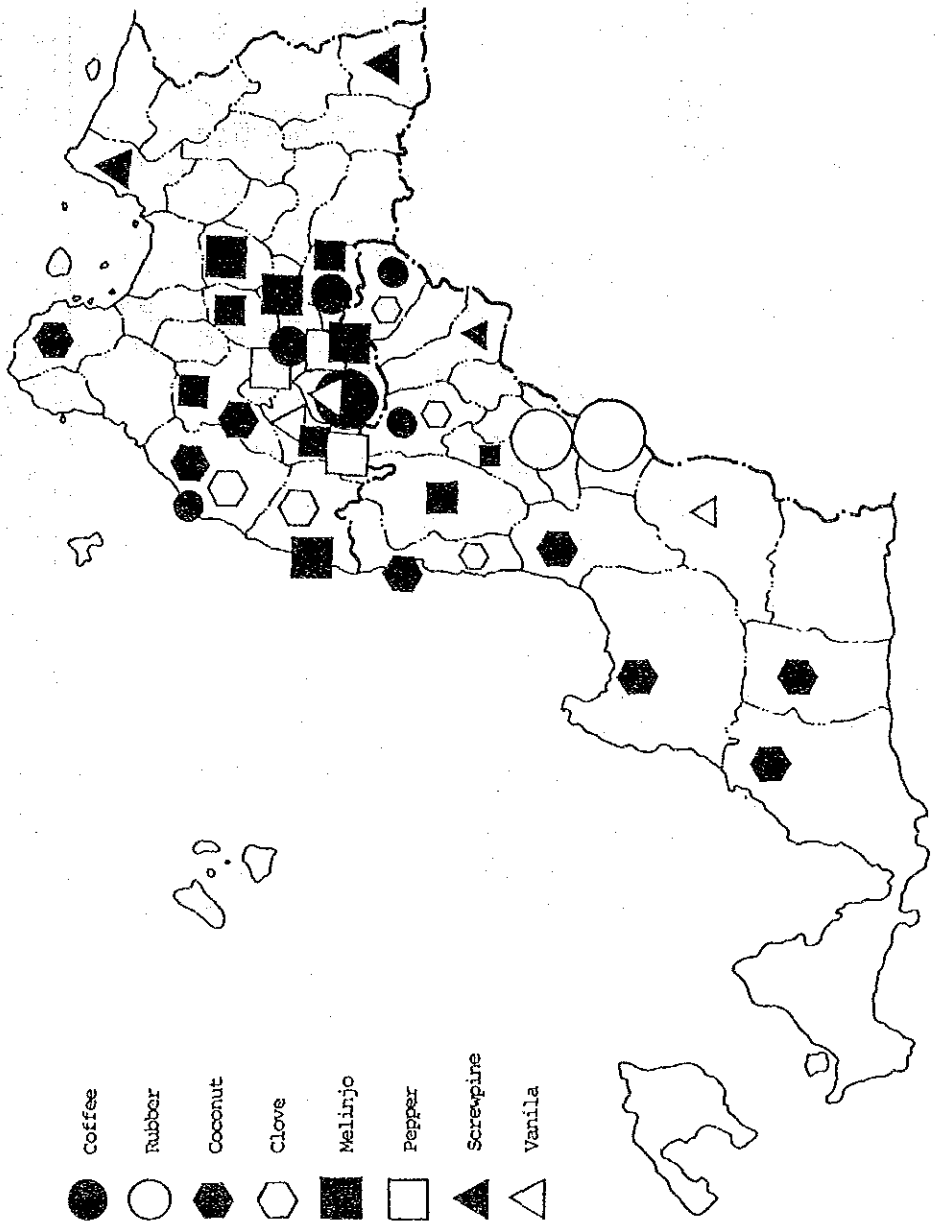
Sources: Dinas Pertanian Tanaman Pangan
Serang, Laporan Tahun 1985;
Dinas Pertanian Tanaman Pangan
Pandeglang, Laporan Tahun 1985.

In 1984, production of coffee amounted to 1,993 tons, rubber 4,012 tons and coconut 23,820 tons. Melinjo, which is an important material in food processing, accounted for a production of 2,748 tons and screw-pine used in handicrafts had a production of 269 tons in 1984 [see Fig. 2-4].

Animal husbandry is widely practiced but on a small scale in the study region. The principal livestock are buffaloes, horses, goats, sheep, chickens and ducks. Buffaloes are kept for draught labor and also as a security for financial needs as well as a milk source. Horses are mainly used for transportation. Goats and sheep are bred for cash sales in local markets. Chickens and ducks are major sources of protein in the people diet, of which eggs and meat are sold when cash is needed.

2.3.5 Fisheries

Fisheries play an important role in the economy of the study region as it is surrounded on three sides by the Java Sea, Sunda Straits and Indian Ocean [see Fig. 2-5]. About 3,561 families depend on fishing activities for their livelihood. They represent more than 22% of the total fishery households in West Java. Marine fisheries are mostly practiced in Kab. Pandeglang while inland fisheries are popular in Kab. Serang. Boats used for marine fisheries are relatively small and their activities are restricted to coastal areas. The main fisheries activities in Kab. Serang are practiced in brackish water ponds. Fish production in the study region amounted to 33,246 tons in 1984 with 27,014 tons of sea catch and 4,847 tons from brackish water ponds and 1,385 tons from rivers and lakes.



- coffee
- Rubber
- ◼ Coconut
- ◻ Clove
- Melirjo
- Pepper
- ▲ Screwpine
- △ vanilla

Fig. 2-4
 PLANTATION CROP PRODUCTION
 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



Sources: Kabupaten Serang Dalam Angka 1984;
 Statistik Kabupaten Pangajene 1983-1984; Serang
 Cabang Dinas Perkebunan Kabupaten Di II Pangajene.

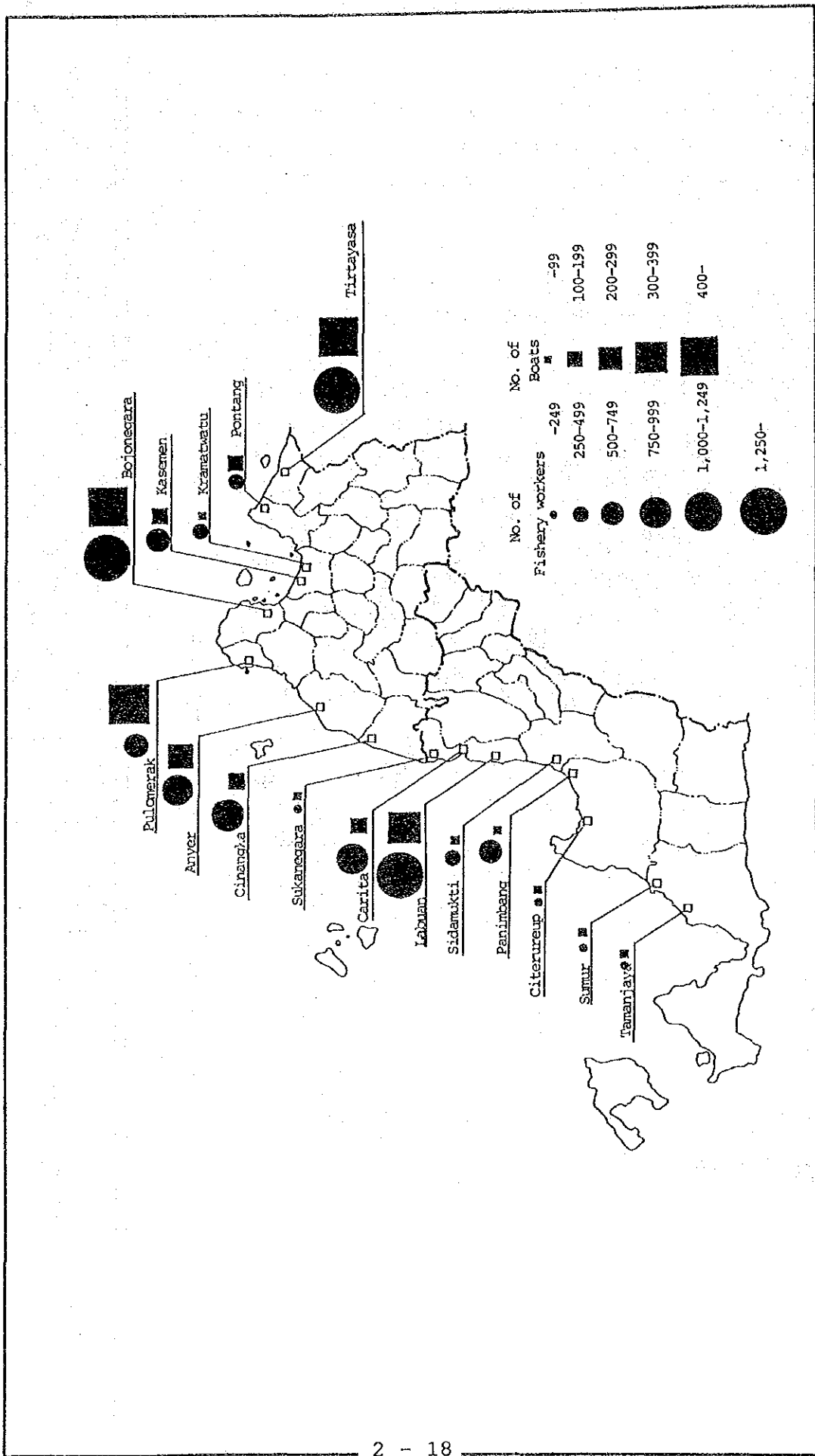


Fig. 2-5
MARINE FISHERY BASES
IN THE STUDY REGION, 1985

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 Pandéglang

2.3.6 Manufacturing

The northern part of the study region is rapidly becoming an industrial zone where such heavy industries as PT Krakatau Steel Works, Pertamina Petrochemical and PT Statomer PVC are operated. However, the majority of industries in the study region are classified in the category of small industries.

The total of small industries in Kab. Serang in 1985/86 comprised 9,841 units with a total of 31,491 workers. Their total production was valued at Rp. 24,426 million. The number of small industries in Kab. Pandeglang was 9,451 units employing 18,109 workers and generating about Rp. 24,326 million in value.

2.4 Infrastructure

2.4.1 Transportation

1) General

There are currently only three types of transportation modes available in the study region namely road, rail and sea. There are no facilities for air transportation and river transportation is almost nonexistent, except at a few river mouths, due to the lack of navigable rivers.

Fig. 2-6 shows the principal transportation facilities in the Provinces of West Java and Lampung such as roads, ports and airports, and Fig. 2-7 shows those in and around the study region.

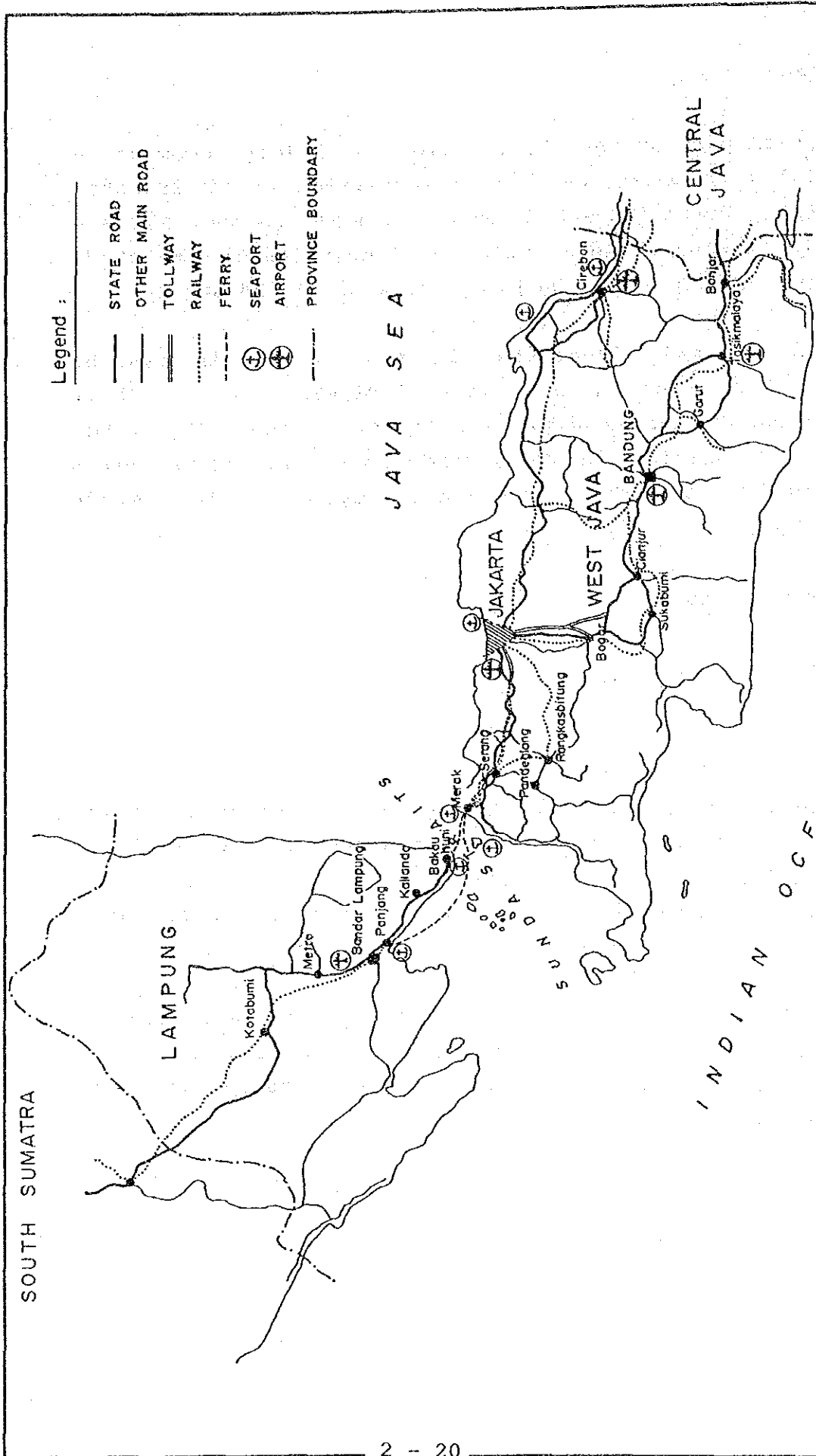
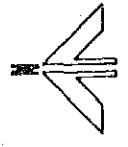


Fig. 2-6
MAJOR TRANSPORTATION FACILITIES

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: The JICA Study Team
Non-scale

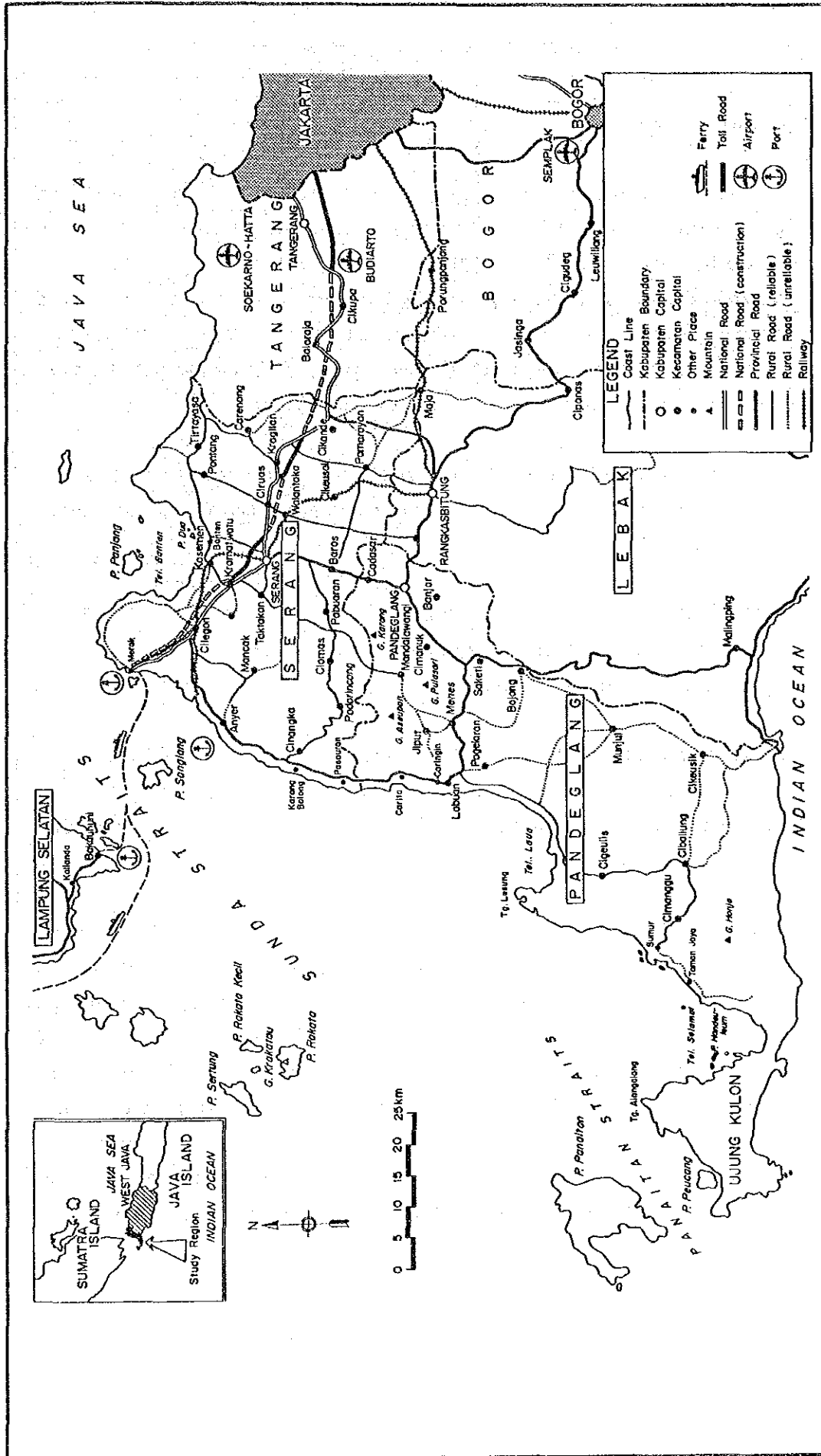


Fig. 2-7
 TRANSPORTATION SYSTEM IN AND AROUND
 THE STUDY REGION

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 : Prepared by the Study Team

2) Roads

(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's policy of placing emphasis on road development in each Repelita of I to IV. Reflecting this policy, an important amounts of investment budget have been allocated to road development.

In and around the study region, the following road links are designated to receive betterment works under Repelita IV:

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

(2) Road network in the study region

The principal road networks in the study region are shown in Fig. 2-7.

Table 2-5 summarizes the length of roads by surface type. The figures for Kab. Serang, Kab. Pandeglang and West Java represent rural roads, namely Kotamadya and Kabupaten roads, while those for the whole of Indonesia further include national and provincial roads. The national and provincial roads, in those two kabupatens apparently are all asphalt surfaced. As for the inventory of the principal roads in and around the study region [refer to Annex Fig. I(B)-4].

Table 2-5 LENGTH OF ROADS BY SURFACE TYPE

			1980	1981	1982	1983	1984
Kabupaten	Area	(km ²)					1,876
Serang	Population	(x1,000)	1,109	1,120	1,127	1,141	1,156
(Rural	Asphalt	(km)	360	369	370	377	364
Road only)	Gravel	(")	80	75	98	208	202
	Earth	(")	162	158	171	171	165
	Others	(")	-	-	-	-	-
	Total	(")	602	602	639	756	731
Kabupaten	Area						2,609
Pandeglang	Population	(x1,000)	695	701	705	717	719
(Rural	Asphalt	(km)	175	208	225	131	261
Road only)	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	Population	(x1,000)	27,104	27,506	27,698	27,918	28,230
Road only)	Asphalt	(km)	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	Population	(x1,000)	147,490	151,000	154,600	158,083	161,580
Road)	Asphalt	(km)	56,519	62,741	66,319	72,646	77,825
	Gravel	(")	74,153	79,860	88,272	98,279	103,062
	Earth	(")	11,642	11,580	10,547	13,814	14,057
	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, but those for others do only rural roads.

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

There are approximately 60 km of national roads in Kab. Serang and approximately 80 km of provincial roads in each Kabupaten. Adding these mileages to the figures of the 1984 in the above mentioned table, the road length per one square km and per 1,000 population were 0.46 km and 0.75 km for Kab. Serang and 0.23 km and 0.83 km for Kab. Pandeglang respectively. Comparable figures were 0.31 km and 0.51 km for the West Java and 0.21 km and 1.21 km for the whole of Indonesia respectively. In terms of area, Kab. Serang is quite favorably developed in roads whereas Kab. Pandeglang is very poor by national standards.

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

Table 2-6 shows the condition of the 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 a vicious circle. It will require a substantial investment to get out of this situation.

Table 2-6 CONDITION OF RURAL ROADS

			1980	1981	1982	1983	1984
Kab. Serang	Area (km ²)						1,876
	Population (x1,000)		1,109	1,120	1,127	1,141	1,156
	Good (km)		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 (km ²)						2,609
	Population (x1,000)		695	701	705	717	719
	Good (km)		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 (km ²)						46,300
	Population (x1,000)		27,104	27,506	27,698	27,918	28,230
	Good (km)		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	8,996	9,865	11,388	11,703

Sources: Java Barat Dalam Angka 1980 - 1984;
Biro Pusat Statistik.

(3) Road management for national and provincial roads

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

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 for about 60% of each project cost. The Government of Indonesia provides the rest of project cost. Fig. 2-8 represents the locations of IBRD programs of betterment works. Almost all of the national and provincial roads in the study region are scheduled to be taken care of in the near future.

(4) Road management for rural roads

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). Funds for management come from the national budget, APBN; Provincial and Kabupaten budget, APBD; and special budget such as INPRES. Under the current program, almost all the Kabupaten roads are scheduled to be treated in one way or other in turn over several years.

3) Road transportation

(1) Vehicle registration

Table 2-7 shows the number of vehicles registered at each year from 1980 to 1984. In West Java, there were more than 800,000 vehicles registered as of 1984, or about 12% of the total vehicle registrations in Indonesia while DKI Jakarta alone occupied a fifth of the total. The equivalent figures per 1,000 population registration are of 28 for West Java, about, 170 for Jakarta and 40 for Indonesia.

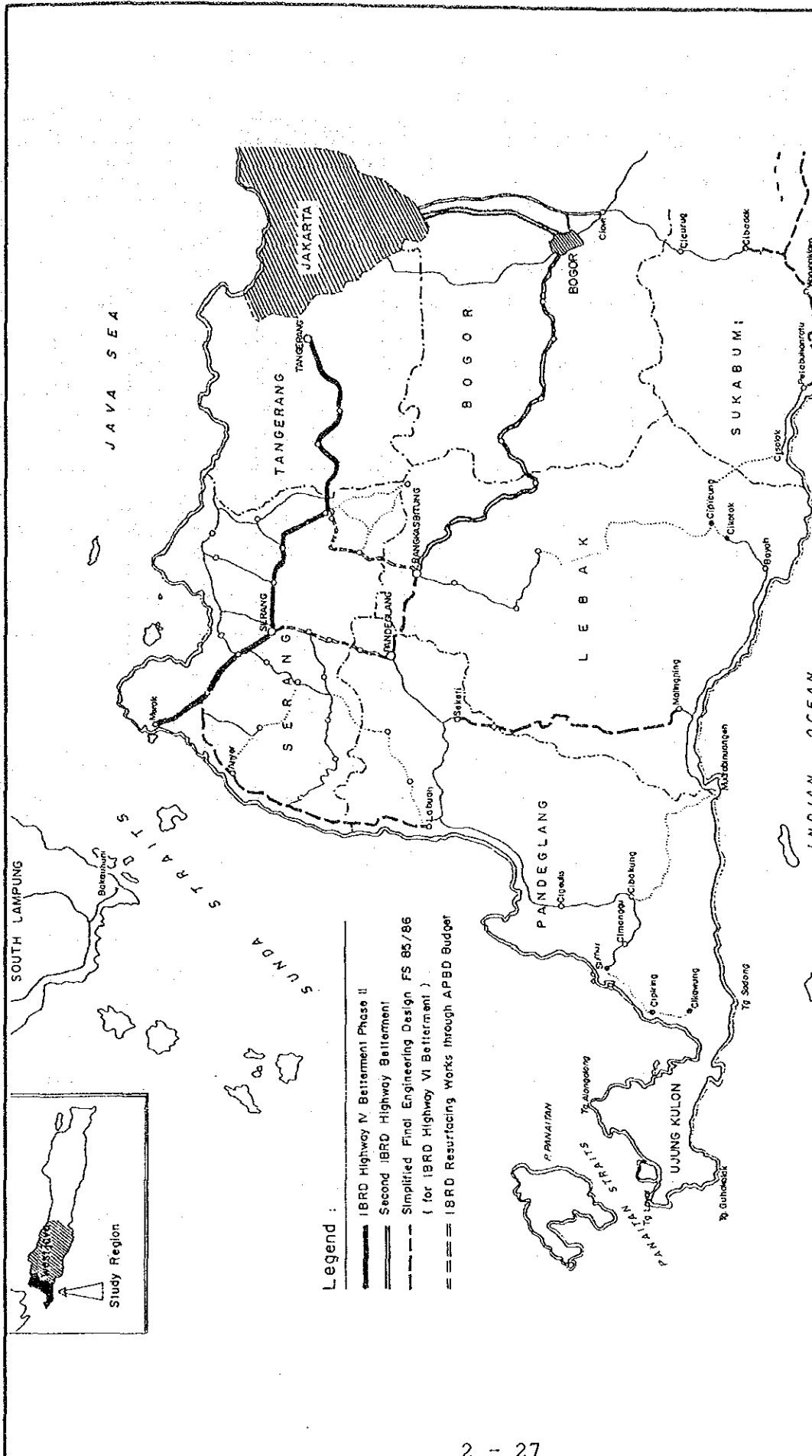
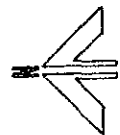


Fig. 2-8
ROAD WORKS PROGRAM OF BINA MARGA

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: Dit. Gen. Bina Marga

Non-scale

Table 2-7 MOTOR VEHICLE REGISTRATION

(Unit: Number)

		1980	1981	1982	1983	1984
Banten Area	Passenger Car	2,594			2,999	
	Bus	389			1,024	
	Truck	4,297			4,811	
	Motorcycle	10,873			23,752	
	Total	18,153			32,586	
West Java	Passenger Car	122,910	133,408	142,497	152,496	152,443
	Bus	10,997	15,339	16,983	19,775	22,904
	Truck	91,864	110,426	116,113	117,087	128,703
	Motorcycle	329,254	392,062	420,498	462,380	501,756
	Total	555,025	651,235	696,091	751,738	805,806
DKI Jakarta	Passenger Car	220,872	247,066	275,139	299,164	321,837
	Bus	29,546	38,478	49,827	62,515	81,047
	Truck	75,219	95,858	112,494	126,859	140,562
	Motorcycle	428,909	495,312	570,972	628,414	669,906
	Total	754,546	876,714	1,008,432	1,116,952	1,213,352
DKI Jakarta	Passenger Car	639,464	719,336	791,019	865,940	925,335
	Bus	86,284	113,509	134,430	160,260	190,808
	Truck	473,831	589,439	657,104	713,873	787,677
	Motorcycle	2,671,978	3,207,499	3,764,442	4,135,677	4,550,742
	Total	3,871,557	4,629,783	5,346,995	5,875,750	6,454,562

Sources: Java Barat Dalam Angka 1984;
Biro Pusat Statistik.

In 1984, the composite percent ratios of passenger car, bus, truck and motor cycle for West Java, Jakarta and Indonesia were 19, 3, 16, 62; 26, 7, 12, 55; and 14, 3, 12, 71 respectively. By area, the statistics indicate the most passenger cars in densely populated Jakarta and most motor cycles elsewhere.

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

Table 2-7 shows the data available for the study area as represented by the 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 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 the much smaller ratio of passenger car ownership than that for the whole of Indonesia.

(2) Traffic volume

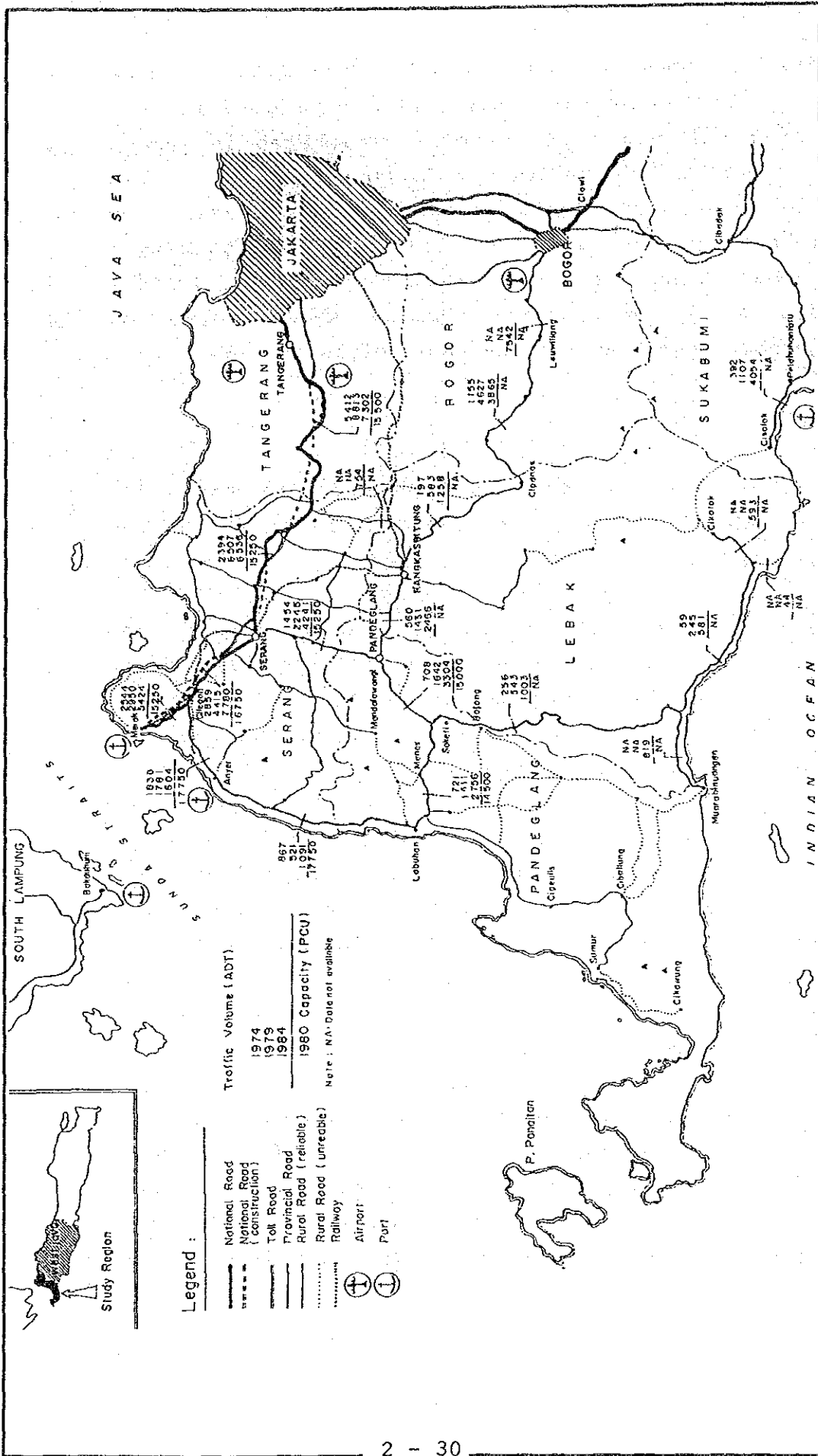
Fig. 2-9 shows the traffic count results for 1974, 1979 and 1984 at major counting points in and around the study region.

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 the high speed of development in this area.

The traffic capacity as of 1980 indicates very comfortable traffic flow though, it should be noted that the figures only represent an average of daily traffic. It is very easy to understand traffic congestions during holiday periods.

(3) Public transportation

For passenger movement by 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.



Source: Dit. Gen. Bina Marga

Non-scale

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. 2-9 TRAFFIC VOLUME

According to the Java Barat Dalam Angka 1984, there were about 6,000 large buses, 8,000 small buses, 35,000 micro-buses and 65,000 becaks in the West Java. Comparable numbers for the Banten area were 225,609, approx. 1,300 and 6,500 in the same order.

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

4) Rail transportation

(1) General development

Railway networks in Indonesia have only been constructed in Sumatra, Java and Madura islands, and are operated and managed by the Indonesian National Railway (PJKA). The total length of these railways has not changed from about 6,700 km of some years, and consists of approximately 1,400 km in West Java, 1,700 km in Central Java, 1,600 km in East Java and the rest, and 2,000 km, in Sumatra, according to the Railway Statistics in 1983 of Central Statistics Bureau.

Rail freight traffic in West Java is shown in Table 2-8 and passenger traffic in Java is in Table 2-9. Freight traffic in West Java has been steadily decreasing while that in Indonesia is increasing. A large increase however has been recorded in Sumatra. Passenger traffic in Java, on the other hand, increased by more than 100% during the period of six years from 1977.

Table 2-8 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 2-9 PASSENGER TRAFFIC IN JAVA

Year	Passenger Embarked (10 ⁶)		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	4,759	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

(2) Railways in study region

In the study region there is only one railway, about 150 km long, running from Jakarta to Merak through Tanah Abang, Rangkasbitung, Serang and Cilegon as shown in Fig. 2-13, and under the control of PJKA. From Cilegon, a line branches off to Cigading, a new

coal unloading port. The railway is double track from Jakarta station to Tanah Abang station for a length of over 10 km, but the rest up to Merak is a single track.

Table 2-10 shows the inventory of locomotives assigned to the Jakarta-Merak line. There are 47 locomotives, apparently all diesel powered, or about 9% of those in Java. There are 211 freight cars or 5% of those in Java, as shown in Table 2-11, 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 on these branch lines are now terminated and the facilities are abandoned and left dilapidating. There is no plan for their rehabilitation, according to PJKA.

Table 2-10 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 2-11 FREIGHT CARS ASSIGNED TO JAKARTA-MERAK LINE

Type	Number	Country	Inventory		
			In-Use	Maintenance	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 day.

Source: PJKA, September 1986.

Train operation is on a 24 hours 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 up to Krenceng, 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 railway 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 2-12 represents the movement of passengers and cargo at Merak both for train and ferry.

Table 2-12 PASSENGER AND CARGO MOVEMENT AT MERAK

Year	Passenger				Cargo				Other	Total
	Train		Ferry		Train		Ferry			
	No.	Mil. Rp.	No.	Mil. Rp.	No.	Mil. Rp.	No.	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

(3) Recent development in study region

A proposal on the railway rehabilitation program, for the transportation of coal from Cigading to Cibinong by rail, is under consideration by the Department of Communication for the Jakarta-Cigading Section as shown in Fig. 2-10.

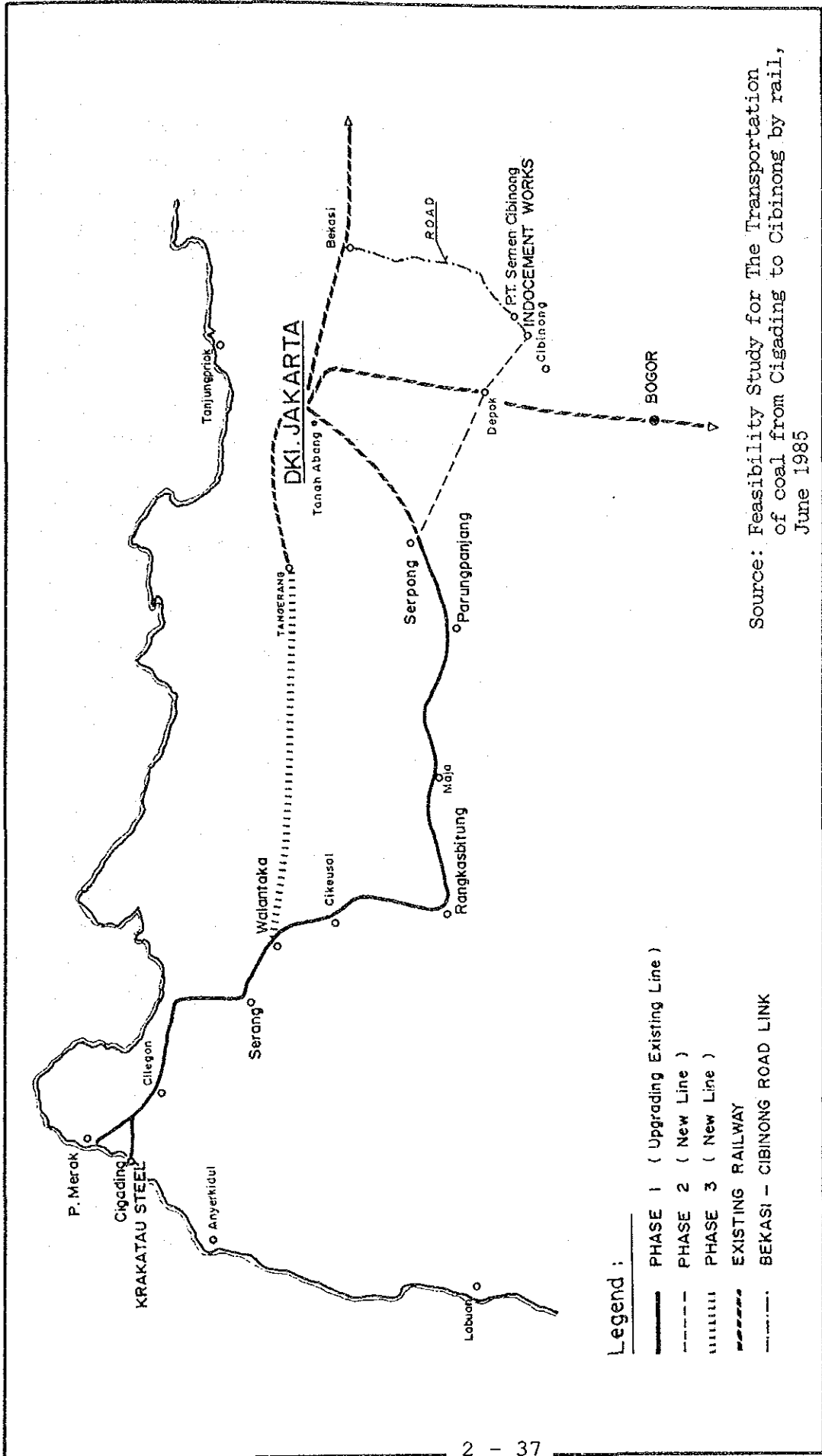
5) Sea transportation and ferry

(1) Port

Apart from the private ports for industries along the coast of Merak-Anyer, there is no public port on the coasts of the study region. Merak port is used exclusively for domestic cargos, but the Cigading port, near Anyer, and Panjang port, near Bandar Lampung, handle both domestic and international cargos.

Apart from the above private ports there are only minor moorings at river mouths and estuaries for fishing in the study region. These moorings are not reliable due to sedimentation and shifting sand-bars and not suitable for movement of boats carrying people and commodities.


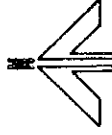
The Directorate General of Sea Transportation does not at present manage any of the ports or moorings in the study region and consequently has no financial data. However, a new port construction project is being carried out at Ciwandan. The new port is planned to be opened in July 1987.



Legend :

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

Source: Feasibility Study for The Transportation of coal from Cigading to Cibinong by rail, June 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
	
Fig. 2-10 RAILWAY REHABILITATION PROGRAM FOR COAL TRANSPORTATION	

(2) Ferry

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

The ferry departs every hour for 24 hours. Five companies are operating with a total fleet of nine ferry boats ranging from 300 ton to 1,300 ton DWT. Table 2-12 shows the volume of traffic through this port.

During the ten years period between 1976 and 1985, the passenger traffic grew about 3 times and motorcars by more than 50 times. As a result of this explosive increase in traffic, a comprehensive study for the expansion of port facilities was implemented and the result was submitted in July 1986 as a Master Plan for Bakauhuni-Merak Ferry Terminals Project. Some related expansion works have commenced already.

There is another plan to link Java and Sumatra by either a tunnel or bridge. The tunnel scheme would be for a railway/car-train project and the bridge scheme for both railway and road. Their progress is not at the time being predictable since a project of this magnitude will be affected by many national level factors.

6) Air transportation

There is no civil aviation facility in the study region. Those few facilities located around the study region are shown in Table 2-13, except for the one at Bogor which is exclusively used by the Air Force.

Table 2-13 CIVIL AVIATION FACILITIES AROUND THE STUDY AREA

Airport	Coordinate	Elevation	Runway		Taxiway	Apron	Terminal	Navigation Facilities	Ground Facilities	Operation	Target
			Number	Dimension							
Soekarno-Hatta /Jakarta	06.07.05-s 106.39.05-E	34 Ft	07-25 3660x60 3050x60 (m)	B 747 Concrete	3060x23 3660x23	Many	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 106.1-E	26 m	06-24 3000x60	B 747 Asphalt Concrete	710x125	224 m ² 313 m ² 20302 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	
Rusein Sastra Negara /Bundung	06.54-s 107.35-E	741 m	11-29 1959x45	F-28 Asphalt Concrete	2476x18	210x115	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 1650x45 1600x45 1040x30	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 1520x3-	F-28 Asphalt	128x23	80x124	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

At the Branti airport at Tanjungkarang, Lampung Province, the Jakarta connection carries almost all the traffic followed by the Palembang one. Garuda Indonesia Airways, the national flag carrier, provides three return services daily connecting with Jakarta by Fokker F-28 with a one and a half hours flight.

2.4.2 Telecommunications

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) 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 Palapa was launched on the orbit in cooperation with ASEAN countries and 132 large and small earth stations were constructed.

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.

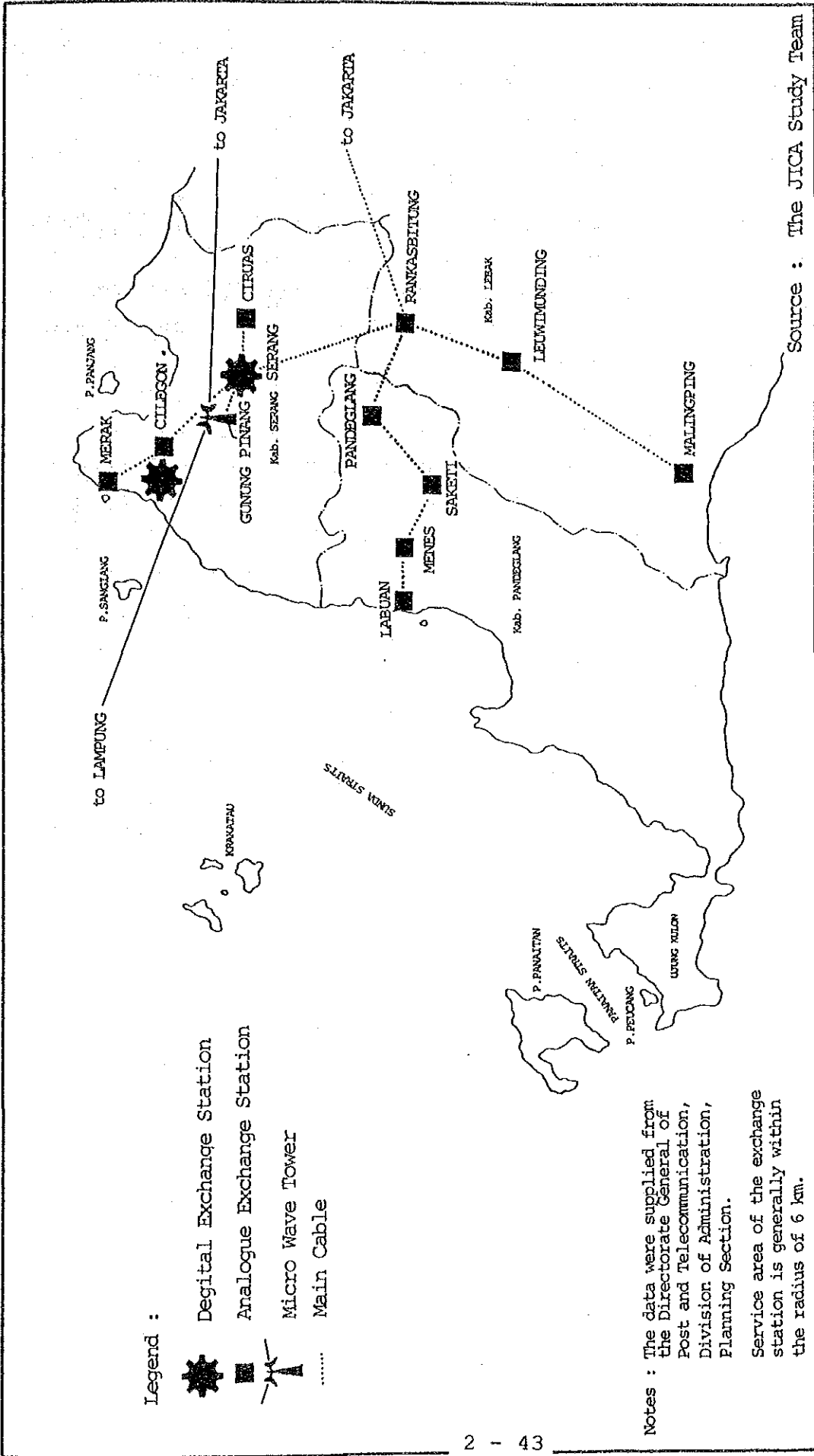
The study region is connected with Jakarta and Sumatra by microwave. The telephone exchanges distributed in main cities in the study region are still of the analogue type except for the digital system in Serang city [see Table 2-14 and Fig. 2-11]. Although the capacity of the exchanges is adequate a present enough, the increasing demand for telephones in the capital of Kabupatens and the industrial city of Cilegon requires the development of new exchanges.




Table 2-14 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 -
Leuwinunding	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



	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. 2-11 EXISTING TELEPHONE NETWORK	

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

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 2-15].

Table 2-15 CONSTRUCTION PLAN OF DIGITAL EXCHANGE
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

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.

2.4.3 Water supply

1) Present Condition of Water Supply System

(1) Domestic Water

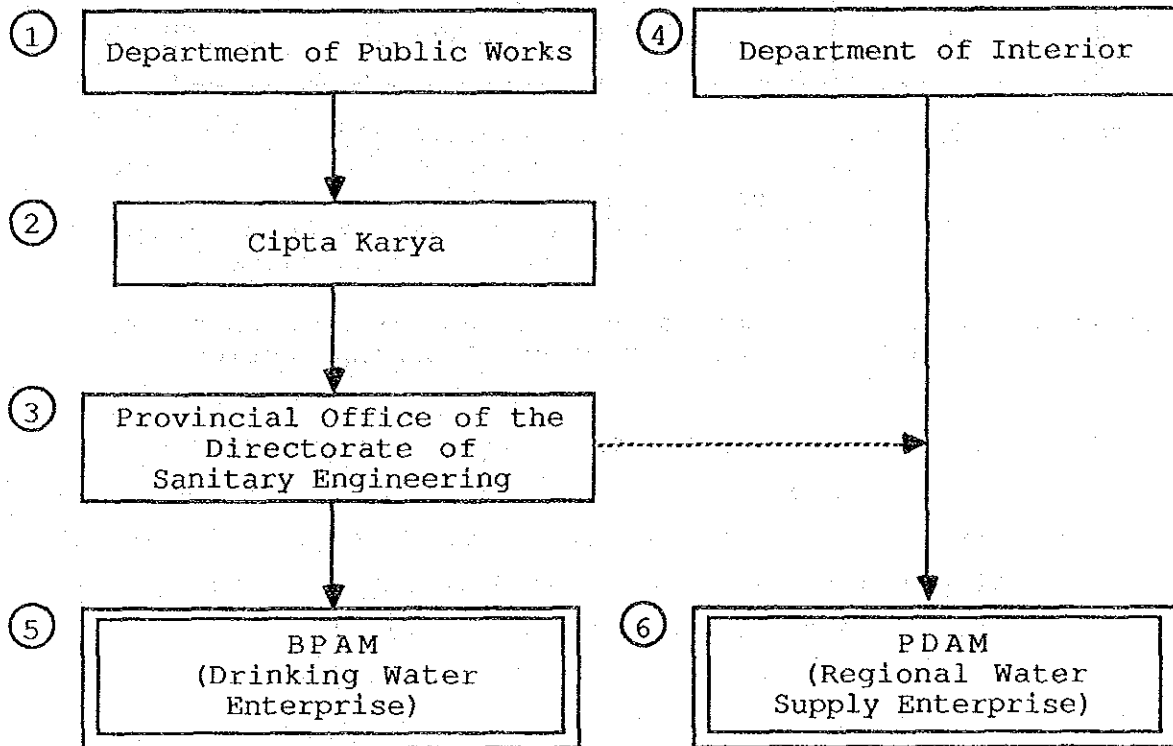
The Regional Water Supply Enterprise (PDAM) and Drinking Water Enterprise (BPAM) are handling water

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. 2-12 shows the organization chart for the water supply system.

Fig. 2-12 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

Tables 2-16 and 2-17 show the present condition of the domestic water supply service in Kab. Serang and Kab. Pandeglang.

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.

(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. 2-13 shows the present condition of the water supply system for domestic use and industrial use in the study region.

Table 2-16 PRESENT CONDITION OF WATER SUPPLY SERVICE FOR DOMESTIC USE IN KAB. SERANG

Service Area	Supplied Water Volume (lit/sec)	Water Source	Treatment Plant	Facility Maintenance	Served Household Number	(1986)
						Ratio to total Household
1 Kec. Tirtayasa	5.0	Irrigation Canal	o	PDAM /1	360	3.2%
2 Kec. Pontang	2.5	Irrigation Canal	o	PDAM	185	2.4%
3 Kec. Ciruas	2.5	Kamayungan River & Irrigation Canal	o	PDAM	117	1.3%
4 Kec. Cikande	2.5	Cidurian River	o	PDAM	135	1.1%
5 Kec. Carenangn	5.0	Irrigation Canal	o	PDAM	170	1.7%
6 Kec. Bojongegara	2.5	Irrigation Canal	o	PDAM	102	1.0%
7 Kec. Baros	5.0	Tapping from distribution pipe of Serang water supply system	-	PDAM	300	5.2%
8 Kec. Cilegon	20.0	Cidanau River (Rawa Danau)	Krenceng Treatment Plant of Krakatau steel works	PDAM	900	8.4%
9 Kec. Serang	/5	50.0 /4 Sukacai Spring & 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 2-17 PRESENT CONDITION OF WATER SUPPLY SERVICE FOR DOMESTIC USE IN KAB. PANDEGLANG

Area	Served Water		Water Source	Treatment Plant		Maintenance Authority	Served Household	
	Volume (lit./sec)						Number	Ratio to total household
1 Kec. Pandeglang	6.0		Ciasam Spring & Ciwasiat Spring	-		PDAM /5	306	17.2%
2 Kec. Pandeglang	3 25.0	Total 31.0	Karang Tanjung Spring	-		BPAM /6	1,205	11.1%
3 Kec. Lubuan	4	20.0	Cidangur River	o		BPAM	1,051	0.3%
4 Kec. Cadasari		2.5	Karang Tanjung Spring	-		BPAM	30	1.2%
5 Kec. Cimanuk		2.5	Cimanuh River	o		BPAM	92	1.4%
6 Kec. Menes		5.0	Deep Well	-		BPAM	125	1.6%
7 Kec. Pagelaran		2.5	Cilemer River	o		BPAM	168	0.5%
8 Kec. Pagelaran		2.5	Cisata River	o		BPAM	88	8.4%

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 north-east from the Pandeglang city.

/3 BPAM started in Pandeglang in 1983 with 79 households and 6 hours/day.

Service: 16 hours/day at present

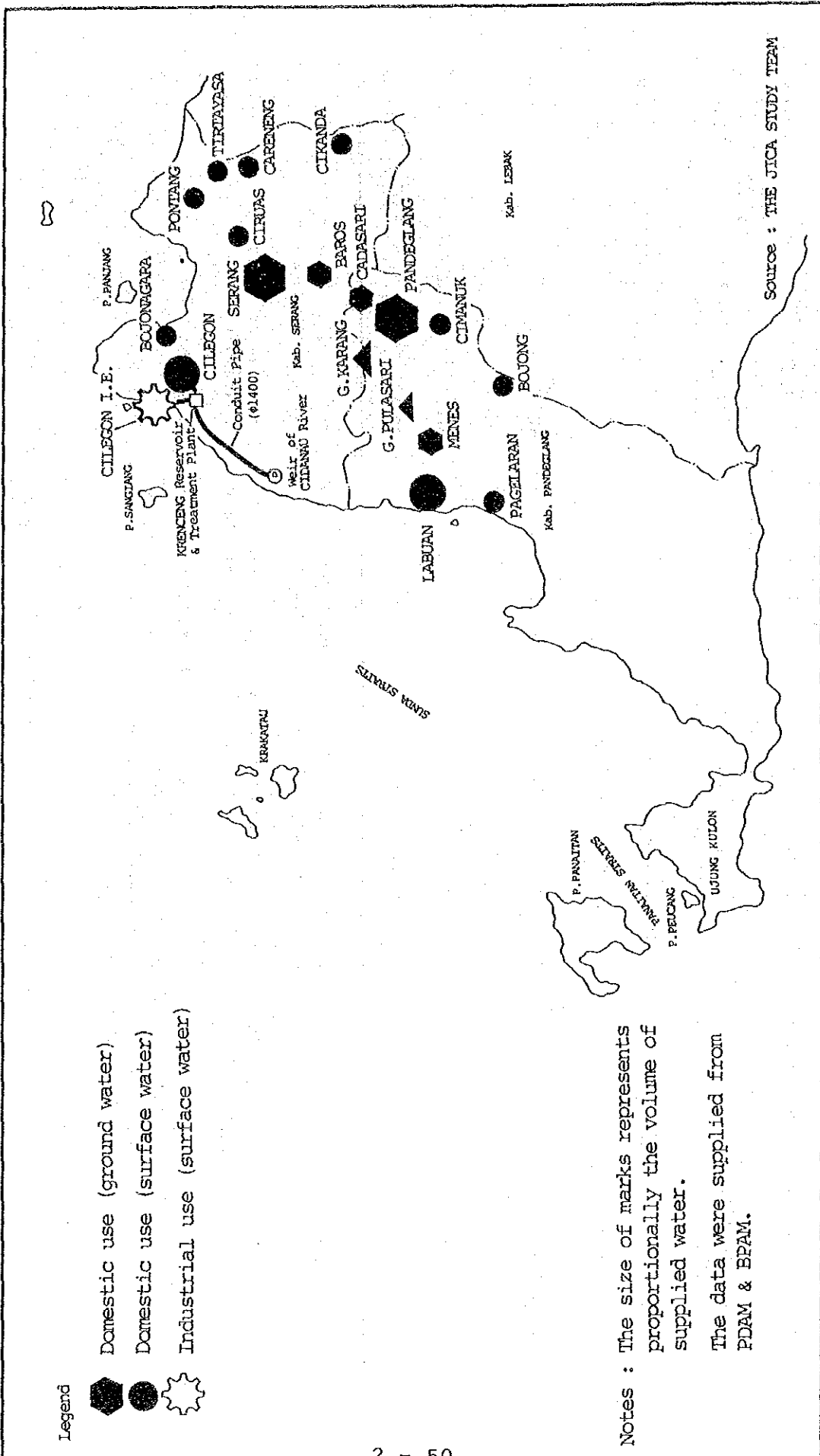
/4 BPAM started in Labuan at 1982 with 14 households and 6 hours/day.

Service: 12 hours/day at present

/5 PDAM: Perusahaan Daerah Air Minum,




/6 BPAM: Badan Penglang Air Minum

Source: PDAM in Serang;



Source : THE JICA STUDY TEAM

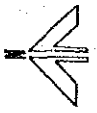
Legend

-  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.

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. 2-13
DISTRIBUTION OF WATER SERVICE
AREAS



(3) Agricultural water

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

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 [refer to Annex I(B), Table I(B)-32].

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 (Ujung Kulon) : Shallow well

2) Future development plan of water supply system

Tables 2-18 and 2-19 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.

Table 2-18 DEVELOPMENT PLAN OF DOMESTIC WATER SUPPLY SYSTEM
IN KAB. 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 from springs
3. Kec. Pulomerak	New development scheme: 5 lit/sec from 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 2-19 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 a 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

In Kab. Pandeglang, BPAM is planning to develop the water supply system as shown in Table 2-19. 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. 2-14].

3) Prospective Water Sources for Tourism Development

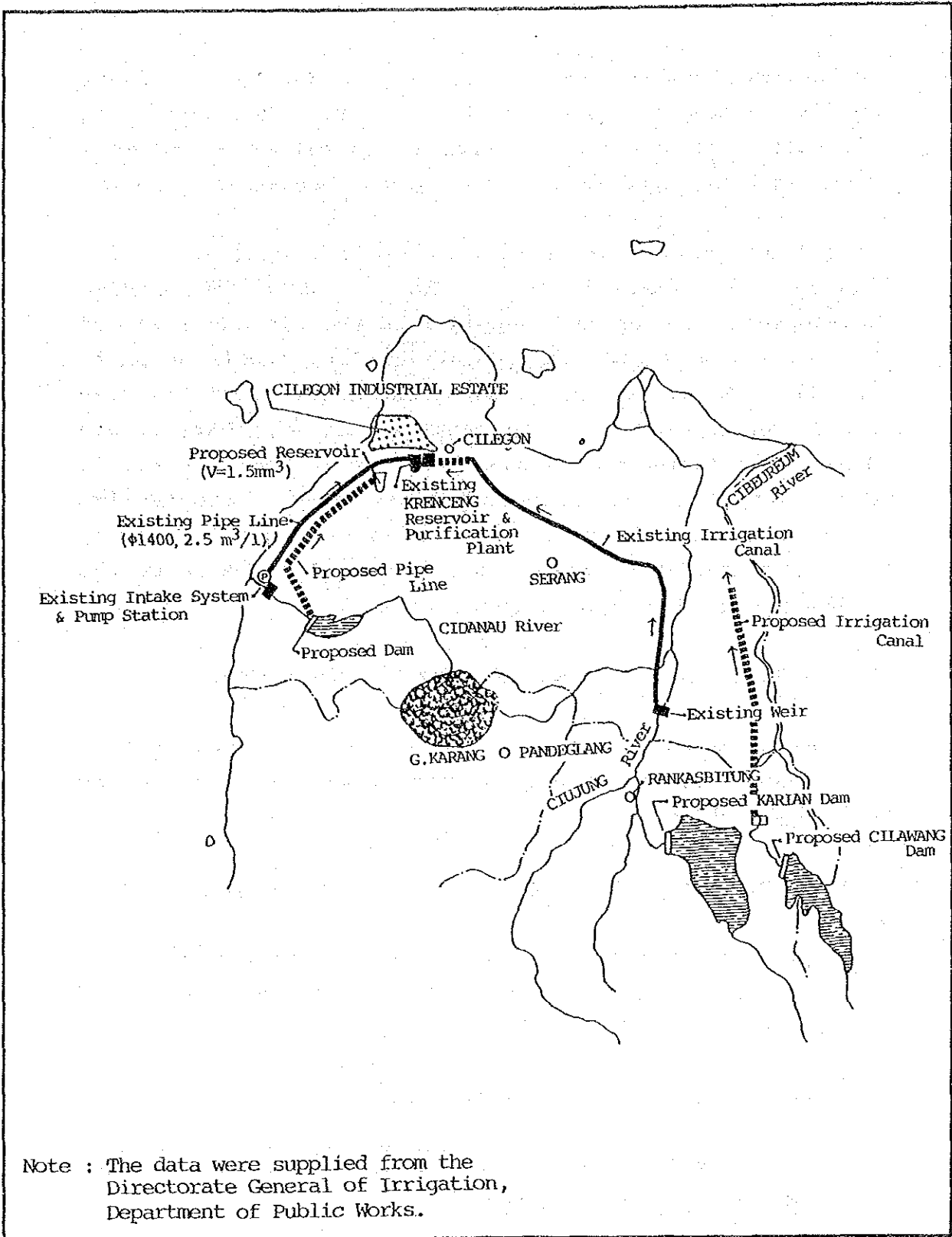
The water demand for tourism development is smaller than for other sectors. The following supply services can be envisaged:

(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.



Note : The data were supplied from the Directorate General of Irrigation, Department of Public Works.

		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	
<p>Fig. 2-14 MAJOR WATER SOURCE DEVELOPMENT PLAN</p>		