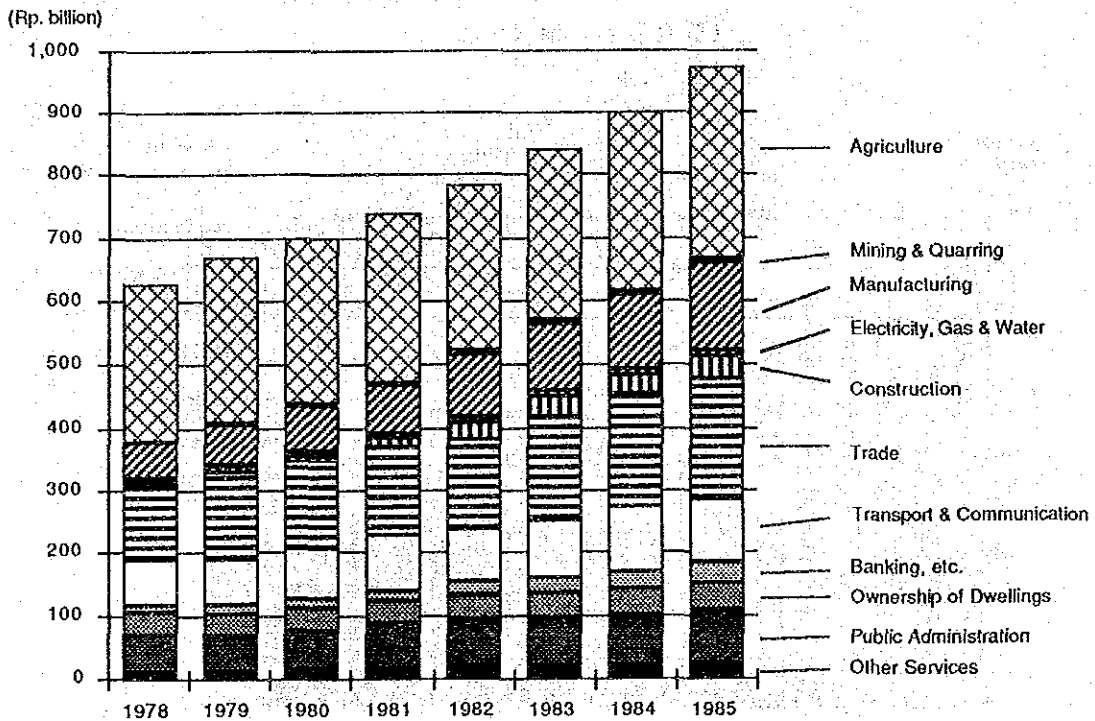


Source: Central Bureau of Statistics

図-6 インドネシアの地域別人口および面積（1985年）



Source: Central Bureau of Statistics

図-7 南カリマンタン州の1983年固定価格による産業別実質地域内総生産（GRDP）（1978年-1985年）

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LEGEND

Phytogeographic Type	Land System	Map Symbol
Swamps	Gambut	[Symbol]
	Nendawai	[Symbol]
	Klaru	[Symbol]
	Kahayan	[Symbol]
	Tanjung	[Symbol]
Alluvial Plains	Tanjung	[Symbol]
	Bakunan	[Symbol]
Alluvial Valleys	Kapor	[Symbol]
	Lawanguwang	[Symbol]
Plains	Teweh	[Symbol]
	Tewai Baru	[Symbol]
Hills	Sungai Serotai	[Symbol]
	Moput	[Symbol]
	Montalat	[Symbol]
	Pakalunat	[Symbol]
	Lohai	[Symbol]
Mountains	Bertwit	[Symbol]
	Pendrah	[Symbol]
	Telawi	[Symbol]
	Bukit Pandan	[Symbol]
	Okki	[Symbol]
	Luang	[Symbol]

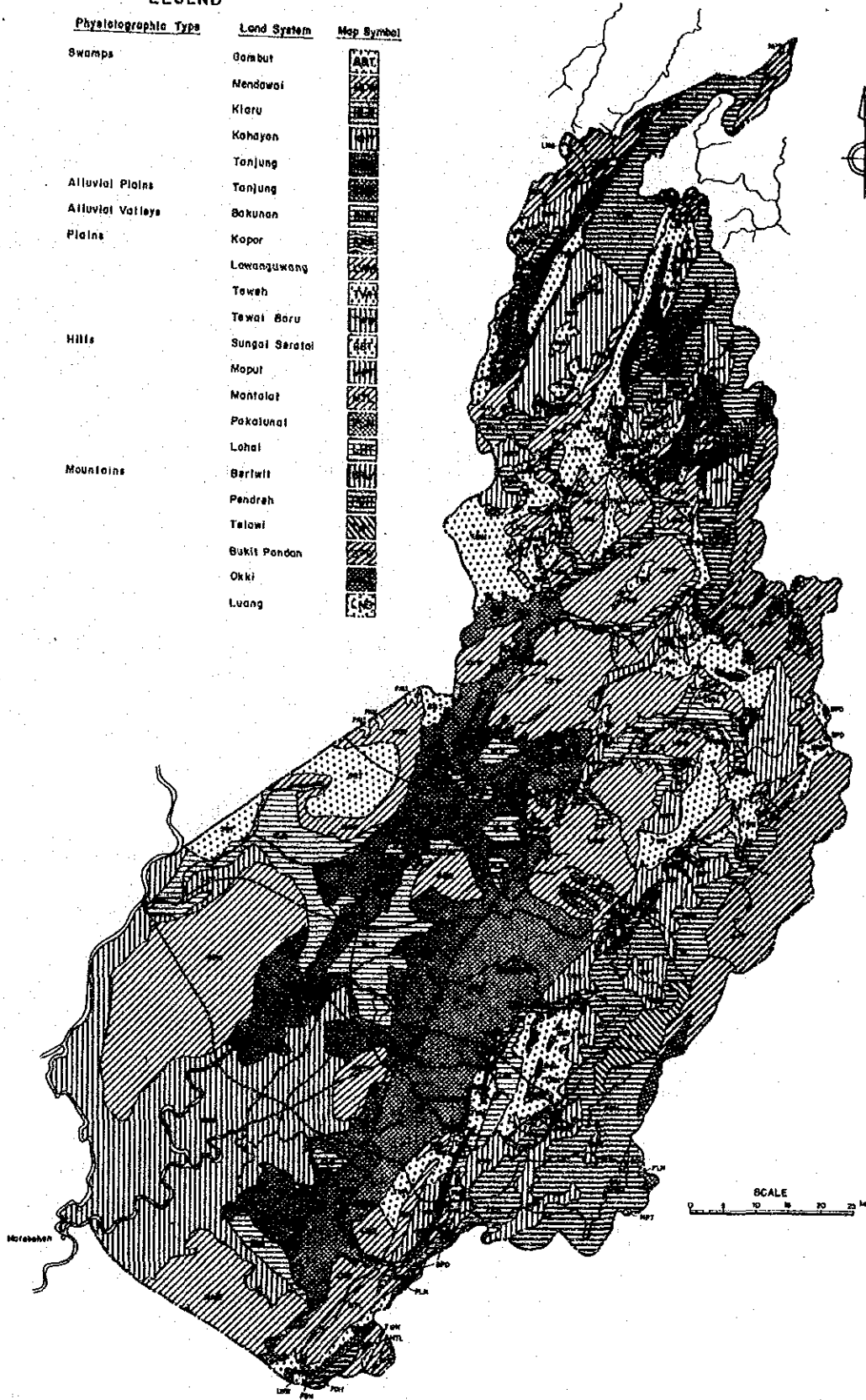


図-8 調査対象地域の地勢図

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 NEGARA RIVER BASIN OVERALL  
 IRRIGATION DEVELOPMENT PLAN STUDY  
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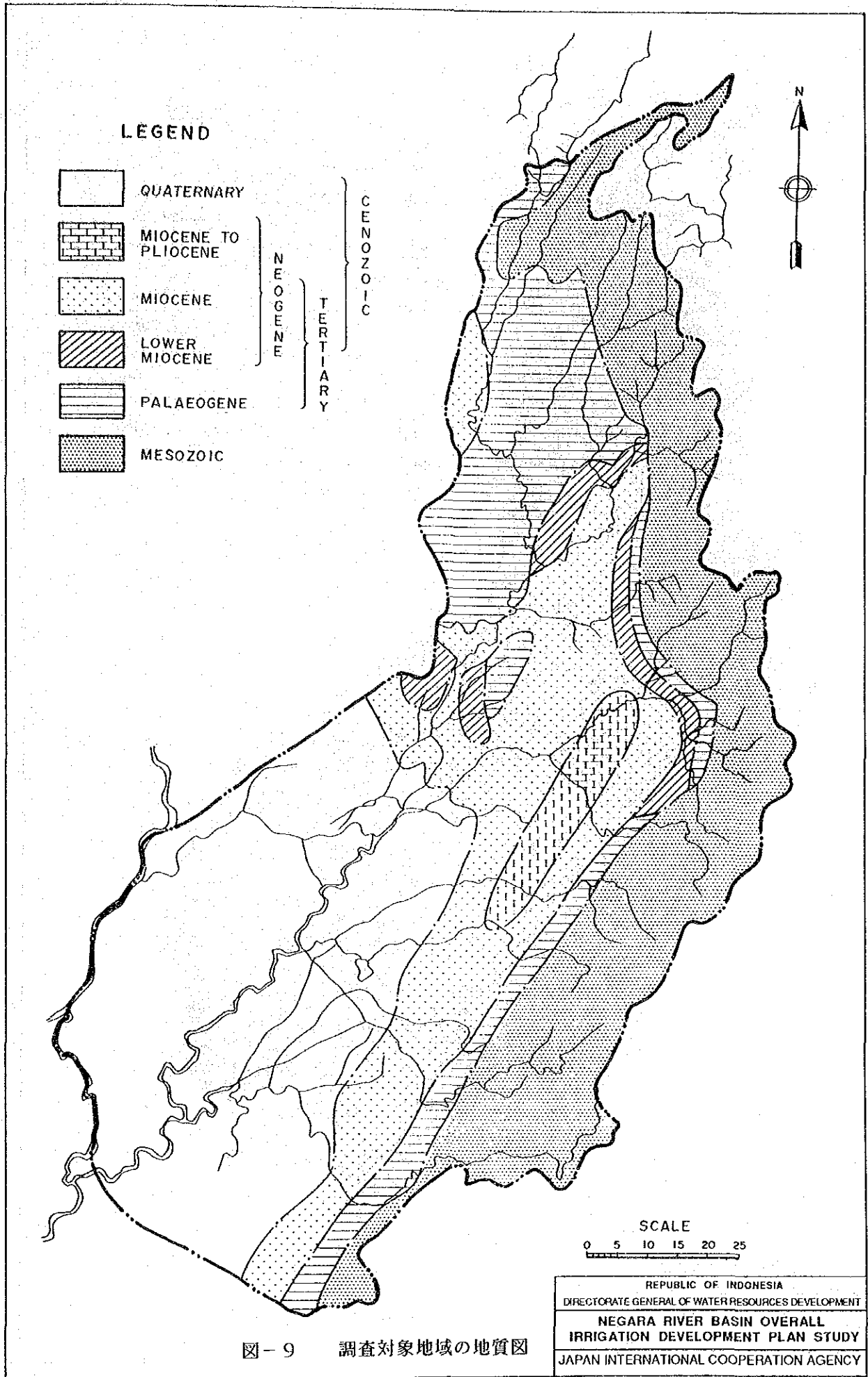


図-9 調査対象地域の地質図



**LEGEND**

Dominant Great Soil Group	Associated Great Soil Group	Map Symbol
① —	Tropchermists & Tropocaprists	①
② —	Tropchermists, Tropocaprists & Tropoquents	②
③ —	Fluvoquents, Tropoquents & Tropchermists	③
④ Tropoquents	Fluvoquents	④
⑤ —	Tropoquents, Fluvoquents & Tropofluvents	⑤
⑥ —	Tropudults, Tropudults & Eutropepts	⑥
⑦ Tropudults	Tropoquents	⑦
⑧ Tropudults	Dystropepts	⑧
⑨ Tropudults	Dystropepts, Tropudults & Troporthods	⑨
⑩ Tropudults	Dystropepts	⑩
⑪ —	Tropudults & Dystropepts	⑪
⑫ Dystropepts	Tropudults	⑫
⑬ Dystropepts	Tropudults & Paleudults	⑬
⑭ Rendzolls	Eutropepts & Tropofollists	⑭

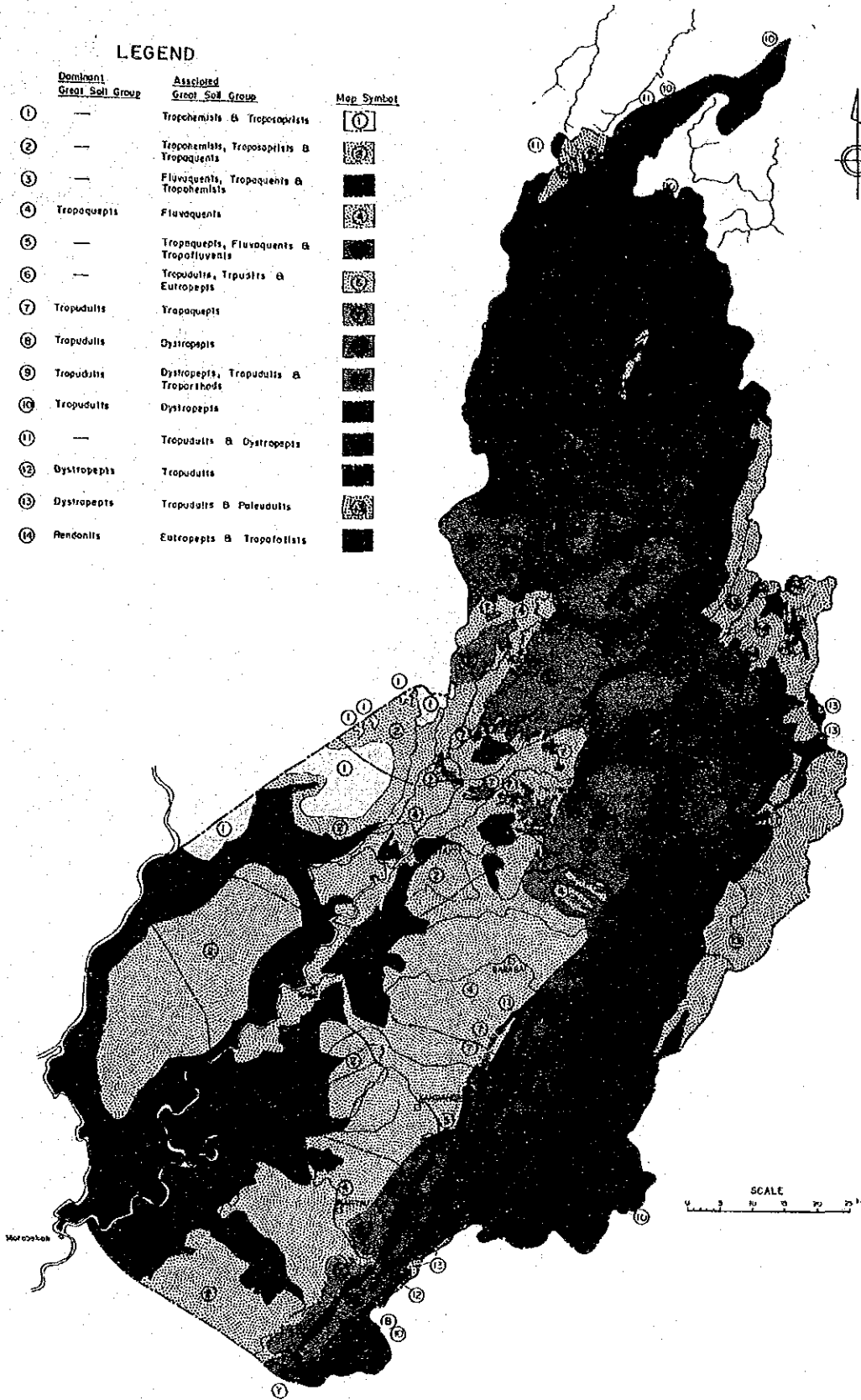
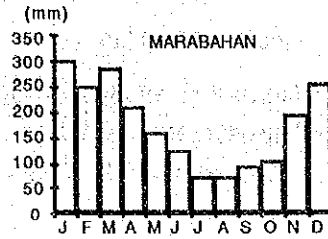
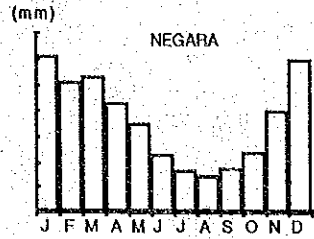
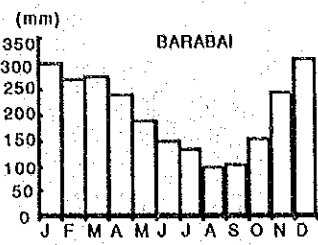
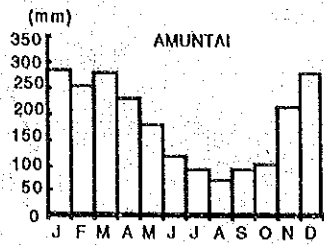
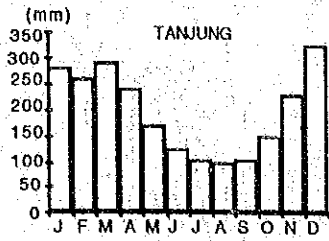


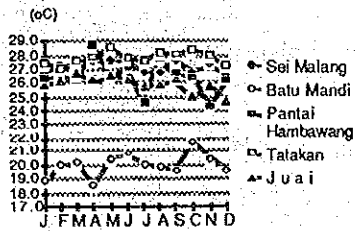
図-10 調査対象地域の土壌図

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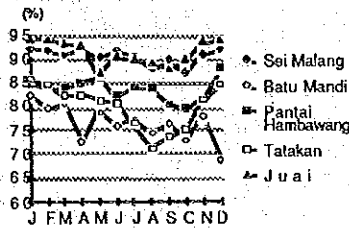




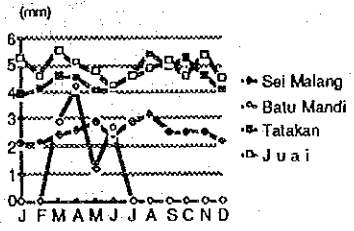
Monthly Temperature



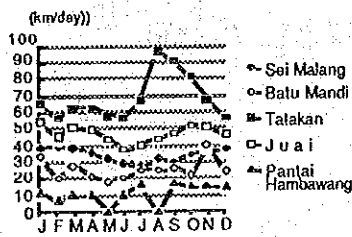
Monthly Relative Humidity



Monthly Evaporation



Monthly Wind Speed



Monthly Sunshine Duration

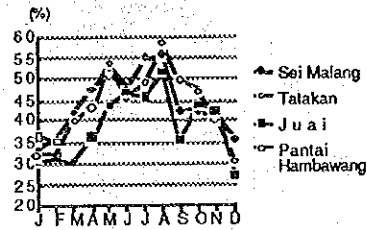


図-11 調査対象地域の気候図

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- LEGEND**
- ③ Tertio-system Number
  - Tabalong* Sub-system Name
  - ..... Negara River System Boundary
  - Sub-system Boundary
  - Tertio-system Boundary

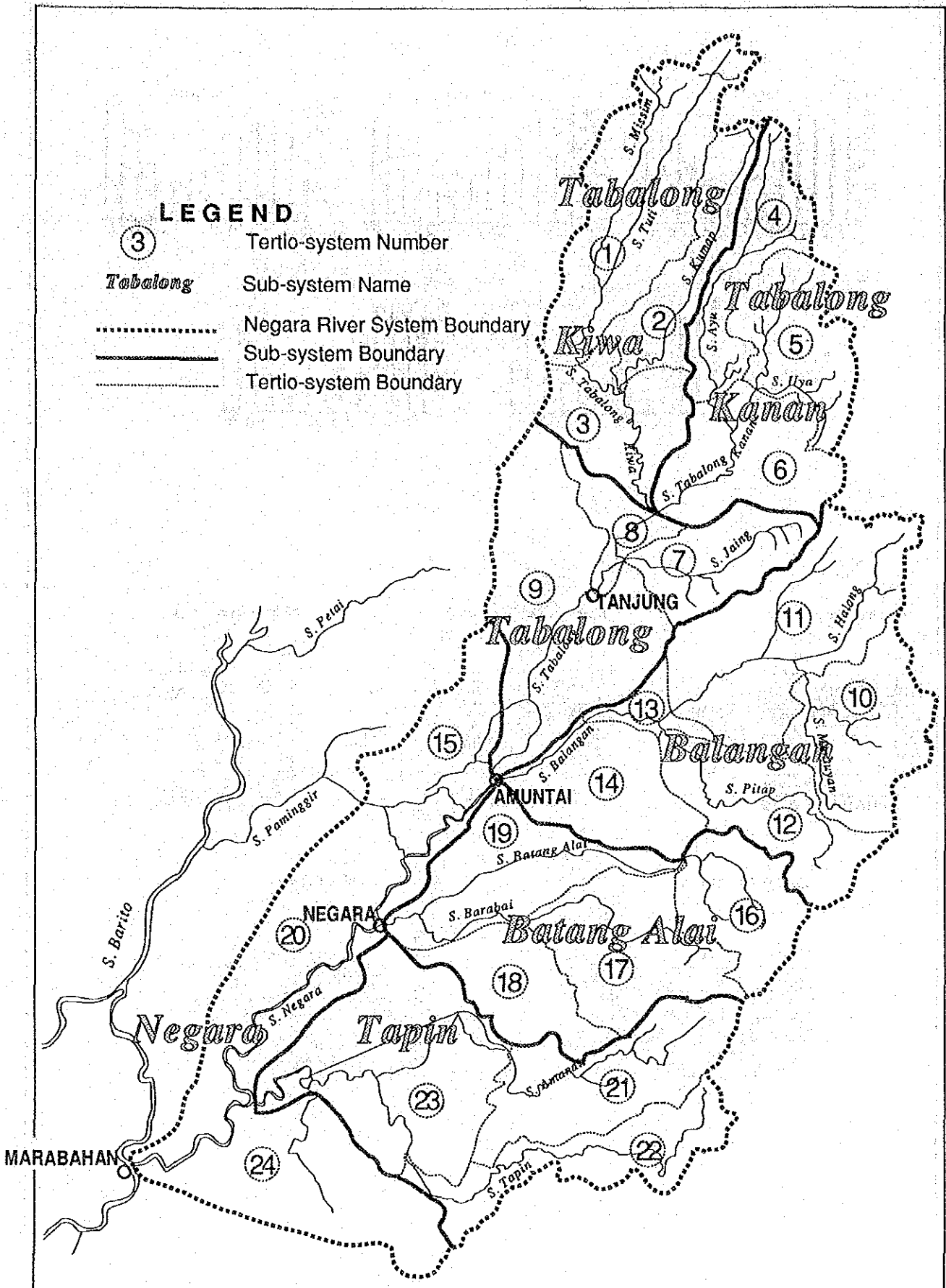
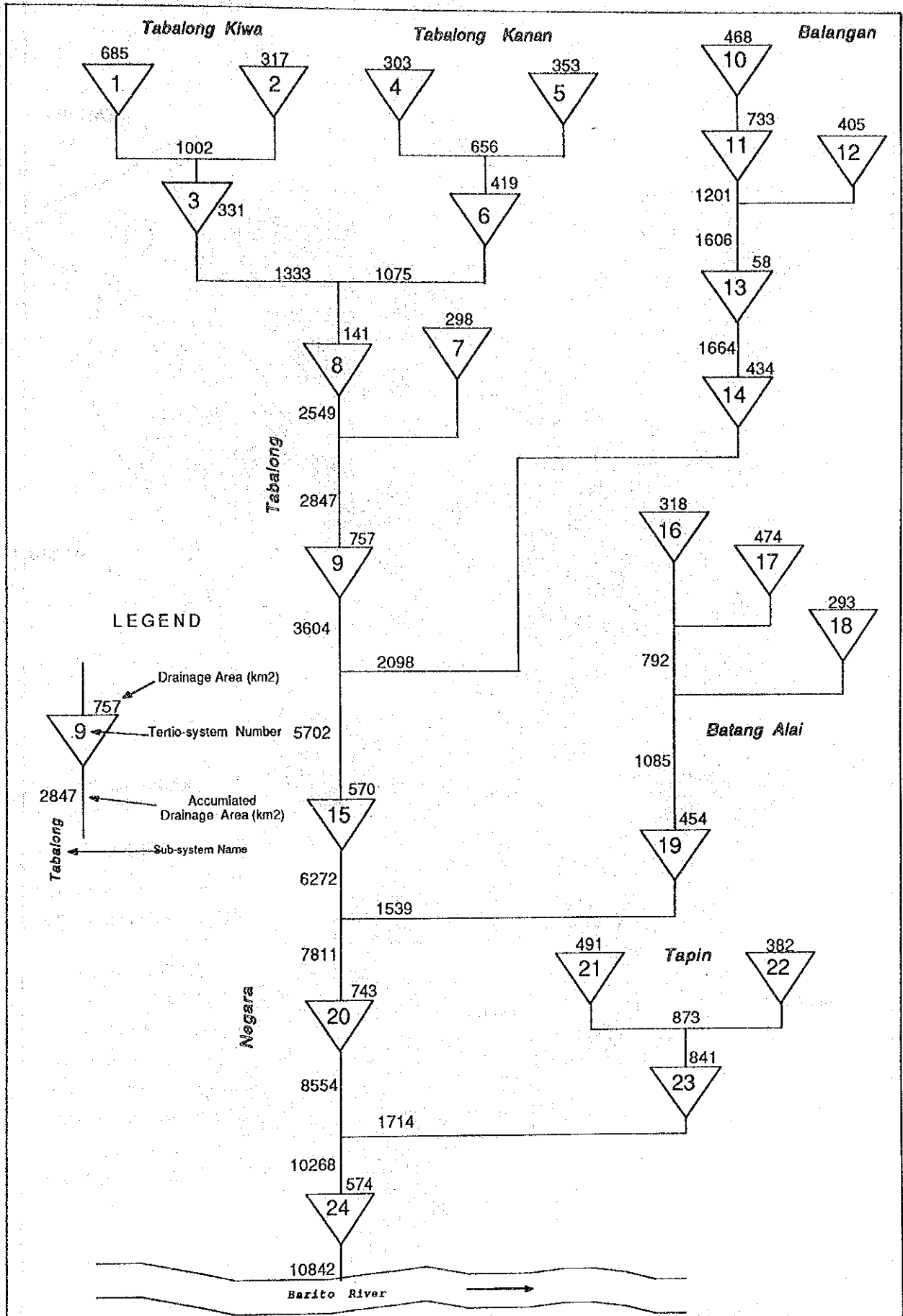






図-12 ネガラ河流域図

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IRRIGATION DEVELOPMENT PLAN STUDY
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**LEGEND**

 Drainage Area (km<sup>2</sup>)  
 757  
 Tertio-system Number  
 9  
 2847  
 Accumiated Drainage Area (km<sup>2</sup>)  
 2847  
 Sub-system Name  
 Tabalong

☒ - 13 ネガラ河水系模式図

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 DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT  
 NEGARA RIVER BASIN OVERALL  
 IRRIGATION DEVELOPMENT PLAN STUDY  
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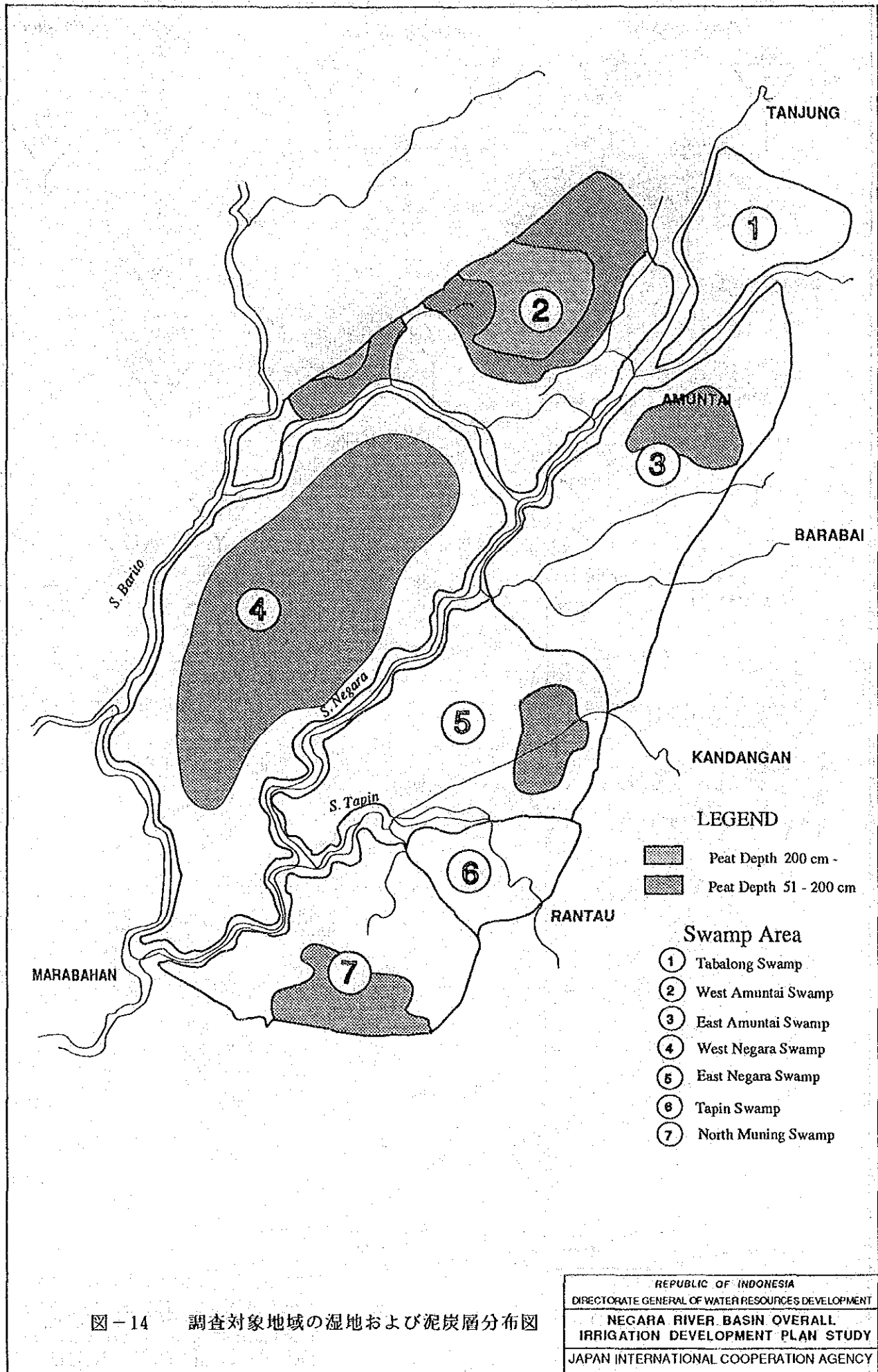


図-14 調査対象地域の湿地および泥炭層分布図

LEGEND

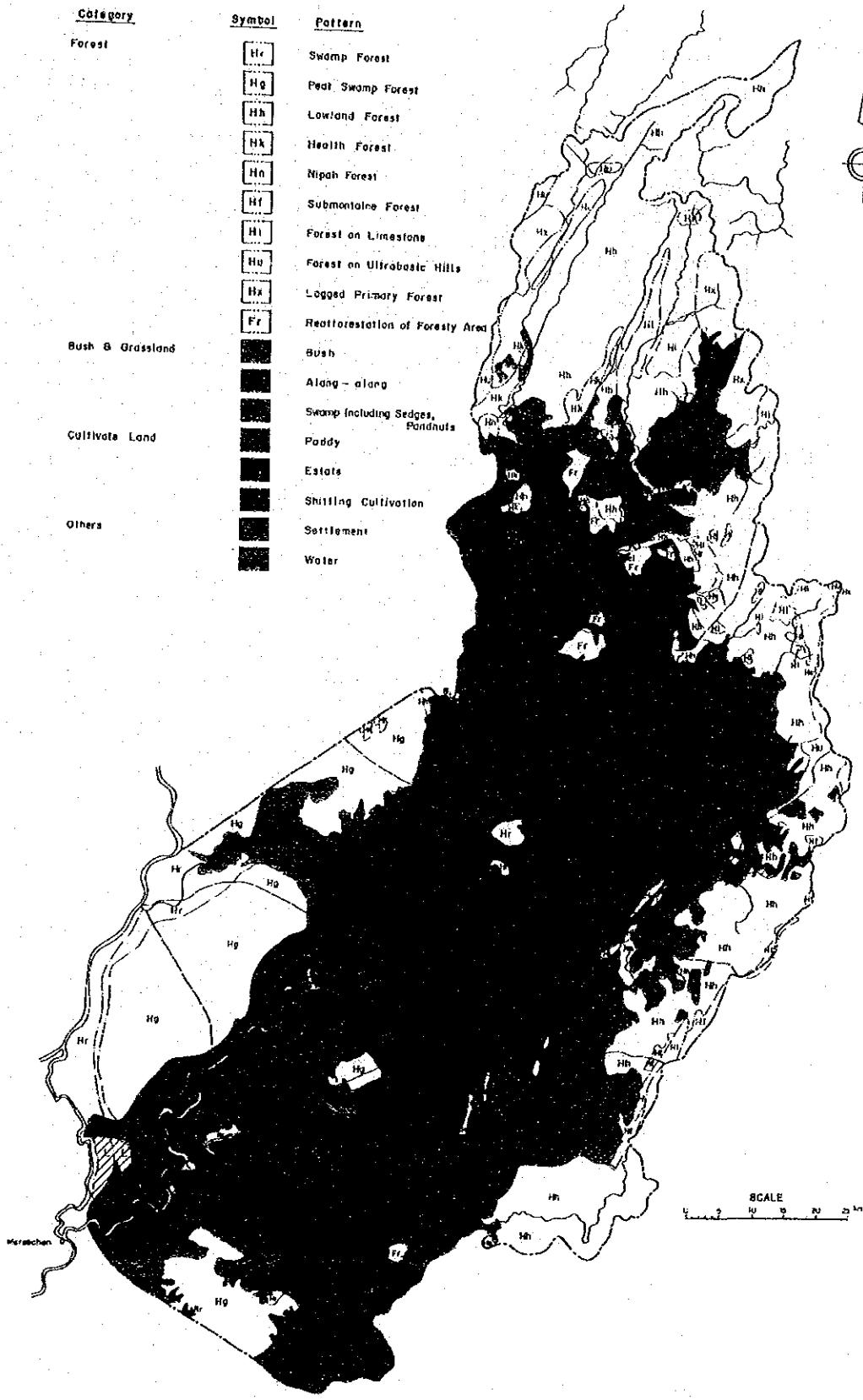


图-15 土地利用图

REPUBLIC OF INDONESIA  
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 NEGARA RIVER BASIN OVERALL  
 IRRIGATION DEVELOPMENT PLAN STUDY  
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Paddy Field Condition	J	F	M	A	M	J	J	A	S	O	N	D
Irrigated	H/V		T/P						H/V			T/P
	T/P		H/V						T/P			H/V
Drained	H/V		T/P						H/V			T/P
	T/P		H/V						T/P			H/V
Poldered	H/V		T/P						H/V			T/P
	T/P		H/V						T/P			H/V
Rainfed	H/V		T/P						H/V			T/P
	T/P		H/V						T/P			H/V

Remarks : H/V : Harvesting  
T/P : Transplanting

図-16 標準的な水稲作付体系

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NEGARA RIVER BASIN OVERALL  
IRRIGATION DEVELOPMENT PLAN STUDY  
JAPAN INTERNATIONAL COOPERATION AGENCY

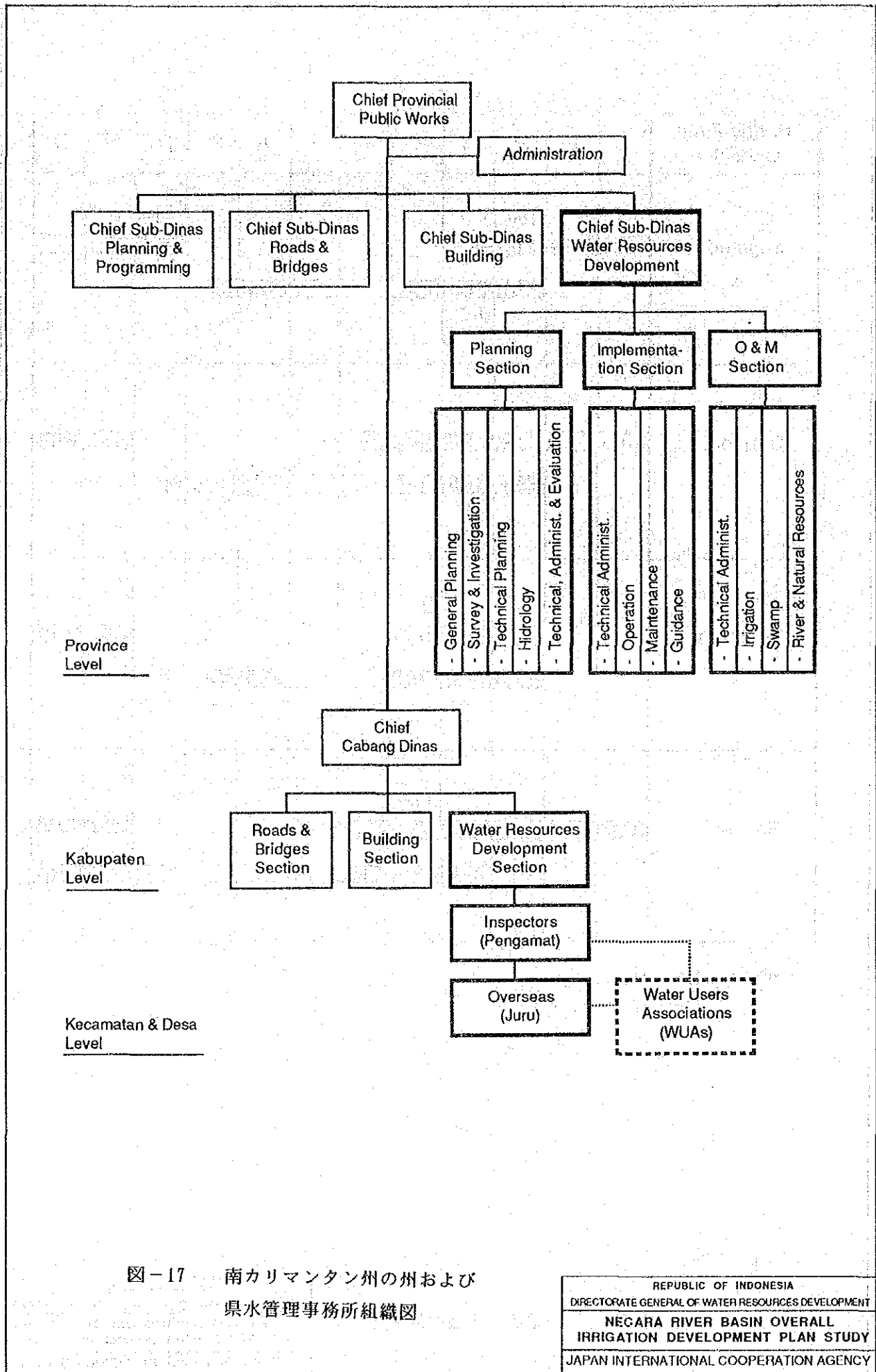


図-17 南カリマンタン州の州および  
県水管理事務所組織図

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 DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT  
 NEGARA RIVER BASIN OVERALL  
 IRRIGATION DEVELOPMENT PLAN STUDY  
 JAPAN INTERNATIONAL COOPERATION AGENCY

Paddy Field Condition	J	F	M	A	M	J	J	A	S	O	N	D
Irrigated	Paddy			T/P			Paddy			T/P		
	Paddy			P			Paddy			T/P		
	Paddy			(Palawija)			T/P			T/P		
Drained	Paddy			P			(Palawija)			T/P		
	Paddy			T/R			Paddy			T/P		
	Paddy			T/R			Paddy			T/P		
Poldered	Paddy			T/R			Paddy			T/P		
	Paddy			T/P			Paddy			T/P		
Rainfed (Alluvial plains and valleys)	P			(Palawija)			P			Palawija		
	P			(Citrus)			P			Palawija		
Rainfed (Swamps)	P			<Mixed Planting>			Paddy			T/P		
	P			T/P			Paddy			T/P		

Remarks: T/P: Transplanting  
P: Planting

図-18 計画作付体系


REPUBLIC OF INDONESIA  
DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT  
NECARA RIVER BASIN OVERALL  
IRRIGATION DEVELOPMENT PLAN STUDY  
JAPAN INTERNATIONAL COOPERATION AGENCY



List of Hydropower Project

No.	Project Name
1	Tablong-1
2	Tablong-2
3	Ayu-1
4	Ayu-2
5	Uwi
6	Halong-1
7	Halong-2
8	Pitap-1
9	Pitap-2
10	Batang Alai
11	Amandit-1
12	Tapin
13	Amandit-2

LEGEND

 Proposed Damsite

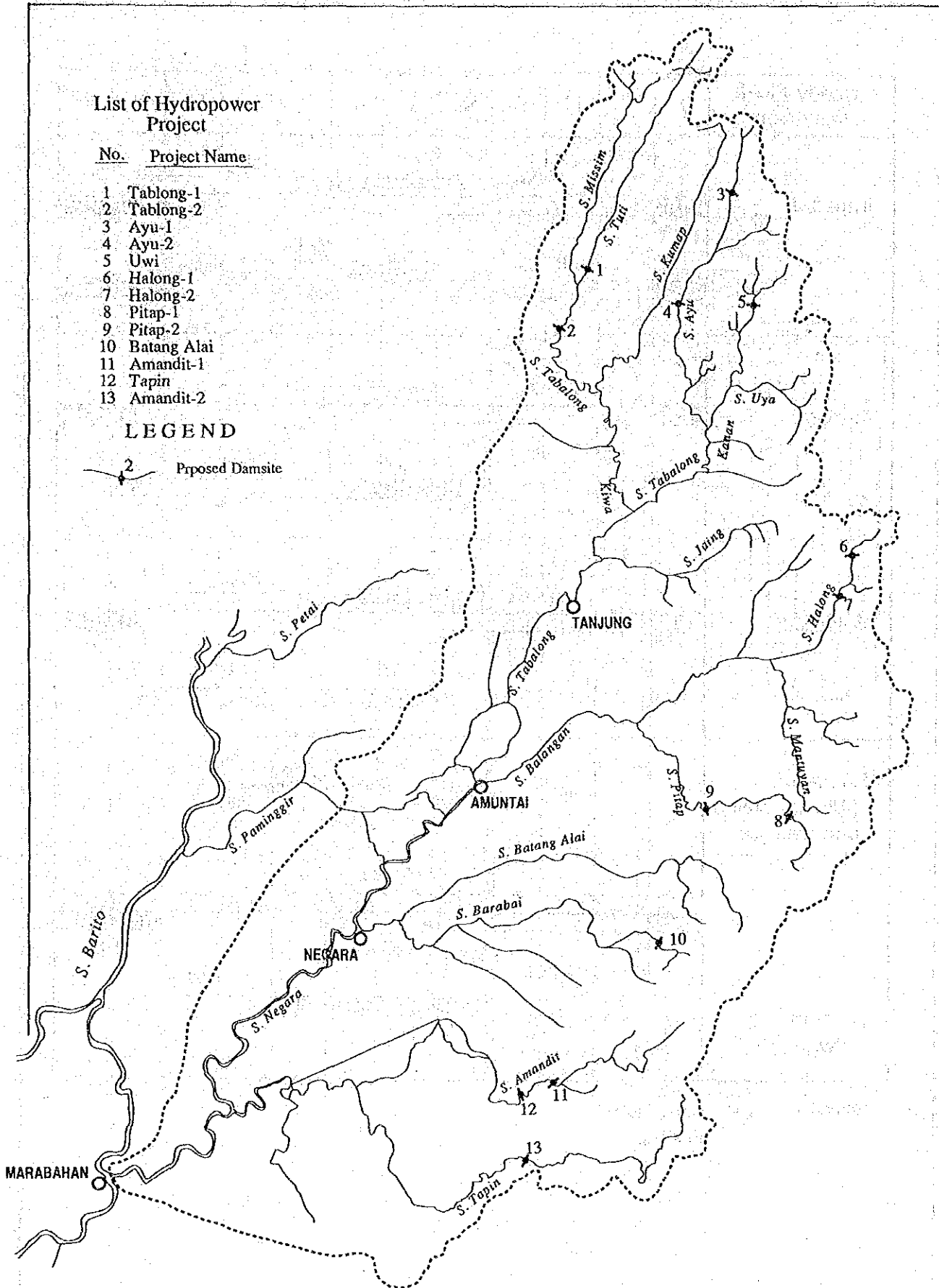


图-19 小水力発電開発可能地点位置图

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 DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT  
 NEGERA RIVER BASIN OVERALL  
 IRRIGATION DEVELOPMENT PLAN STUDY  
 JAPAN INTERNATIONAL COOPERATION AGENCY

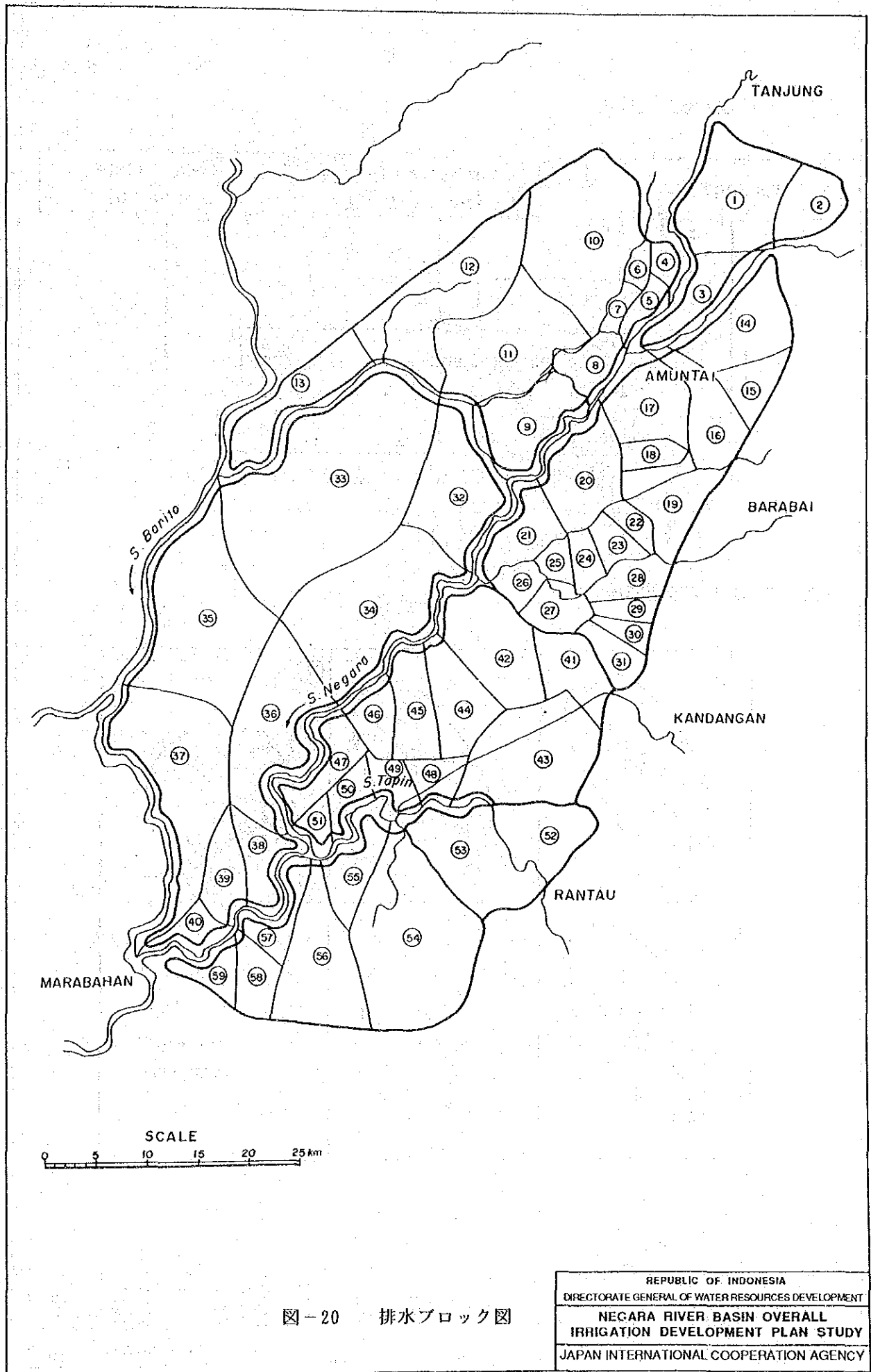
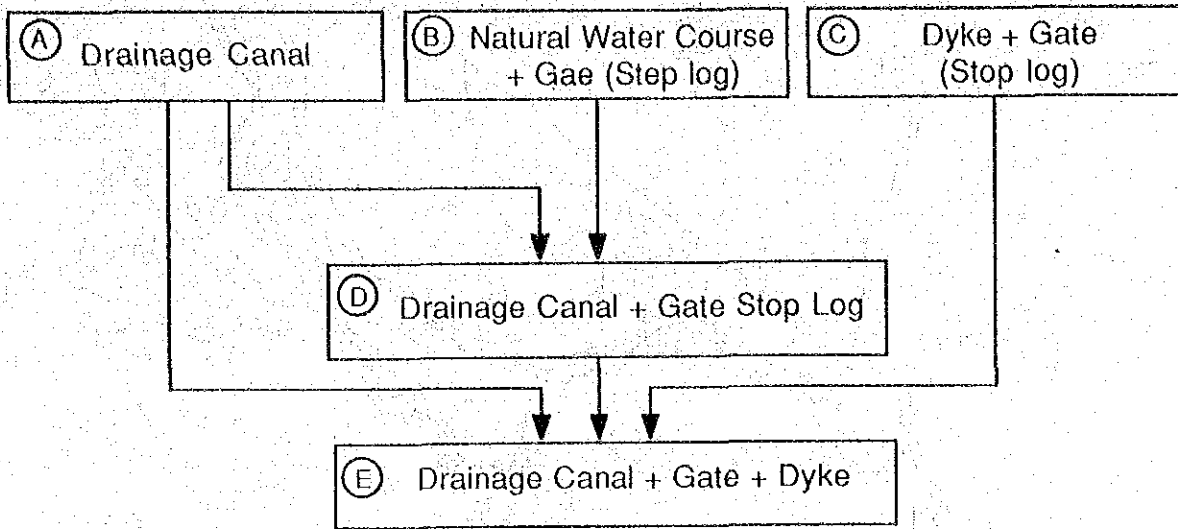


図-20 排水ブロック図

Type of Drainage System



Type of Drainage System

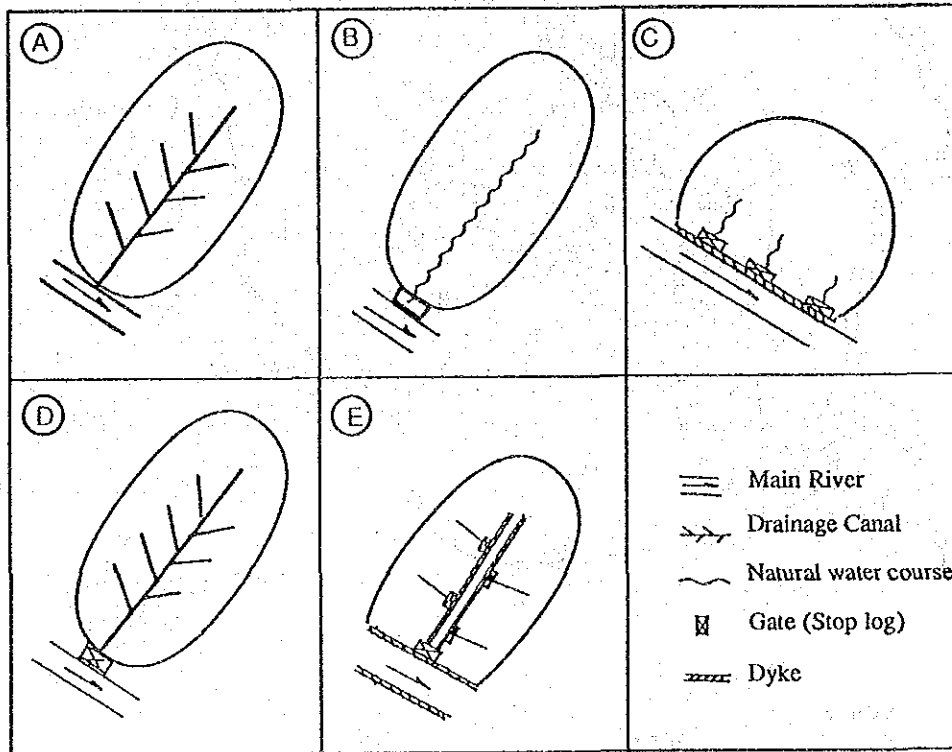


図-21 排水改良の実行手順

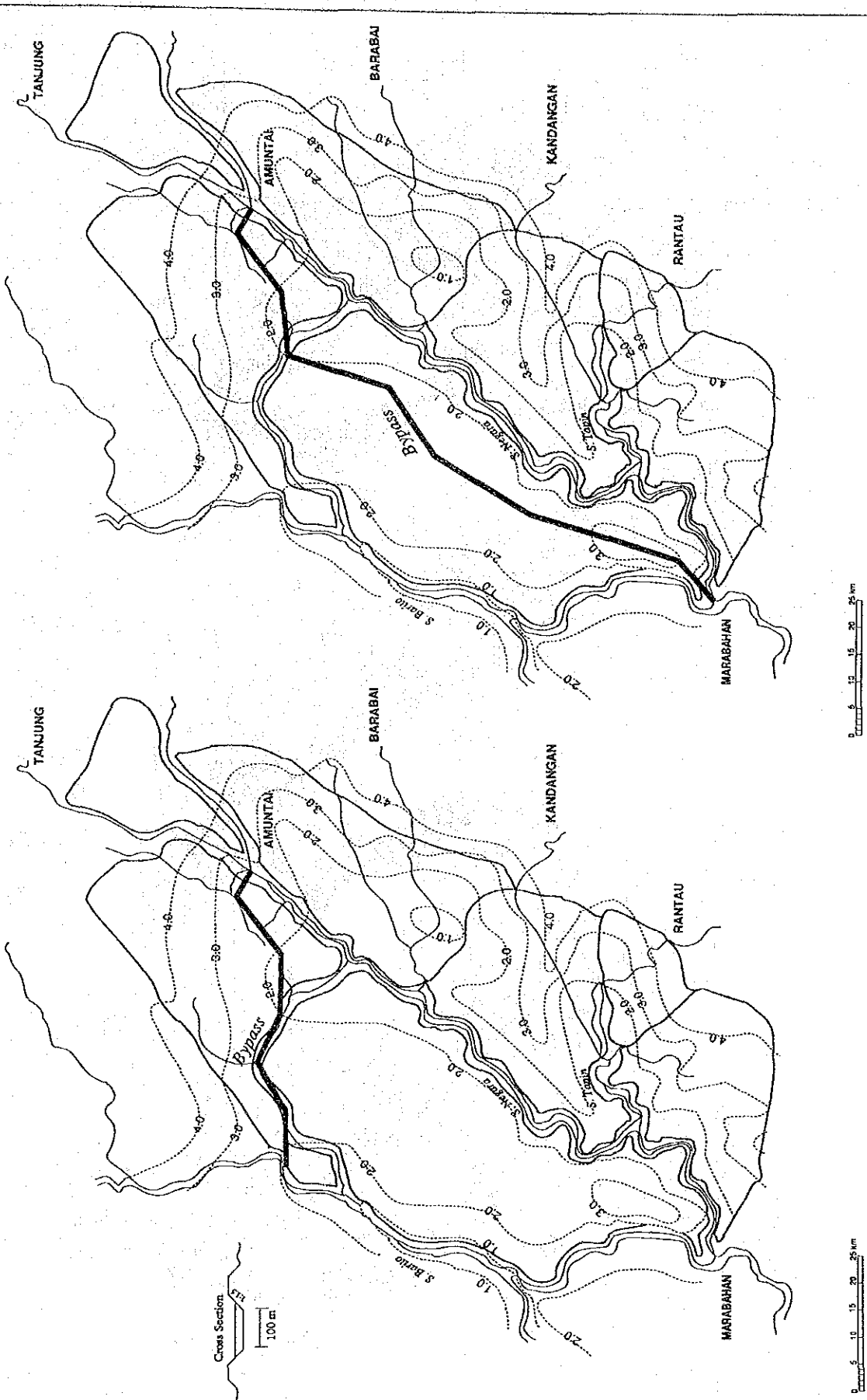
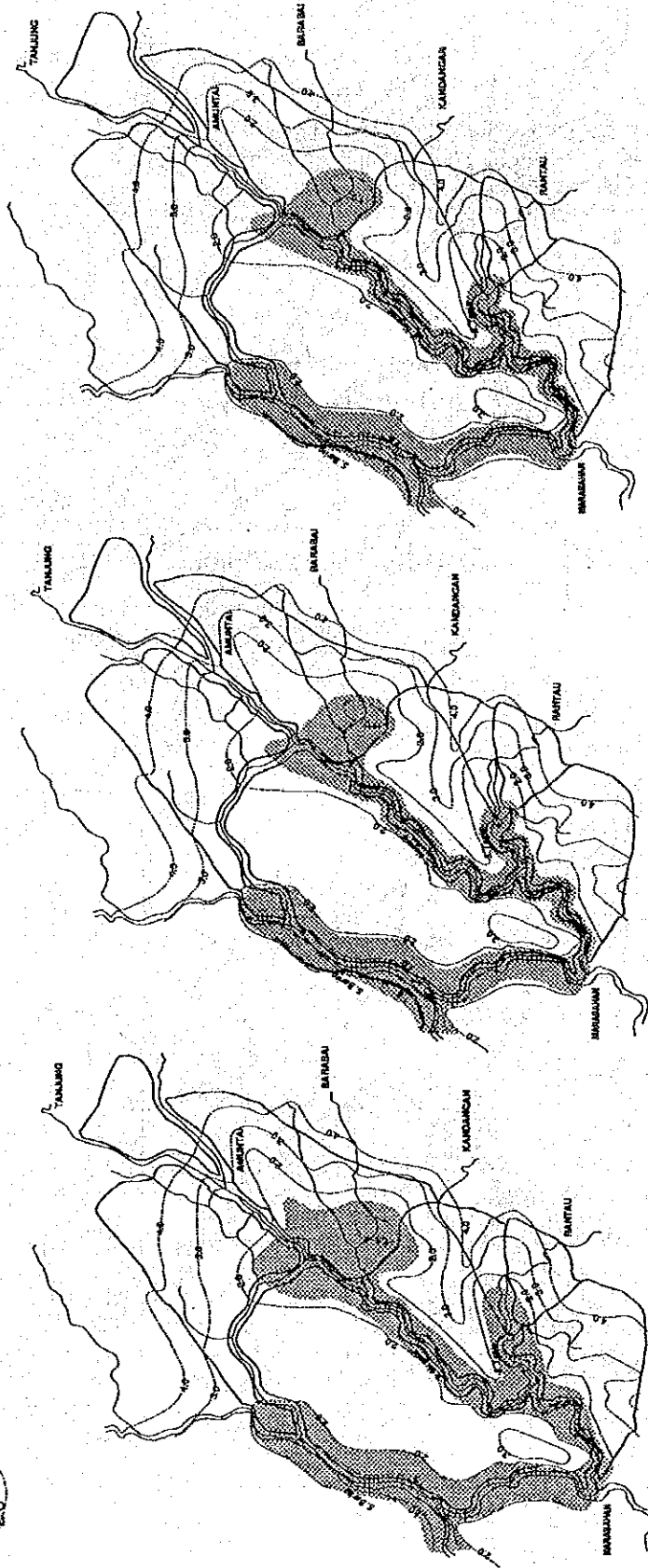
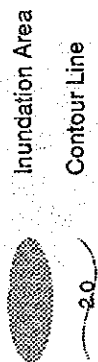


図-22 放水路計画位置図

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DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
NECARA RIVER BASIN OVERALL
IRRIGATION DEVELOPMENT PLAN STUDY
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LEGEND



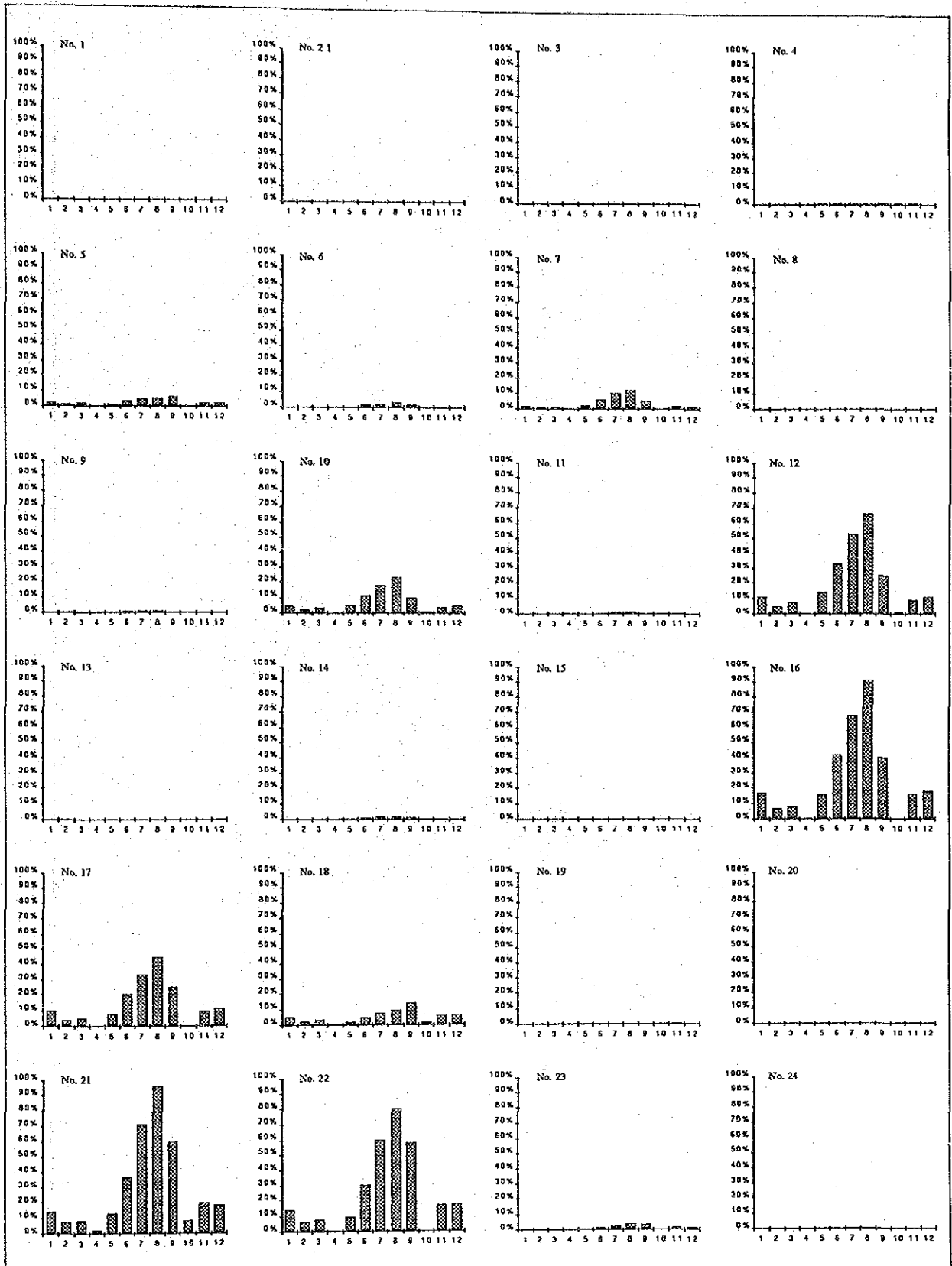
Case 3

Case 2

Case 1

図-23 推定湛水域の類推結果

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 NEGARA RIVER BASIN OVERALL  
 IRRIGATION DEVELOPMENT PLAN STUDY  
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LEGEND

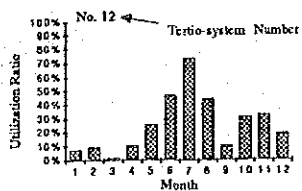
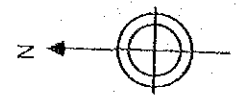
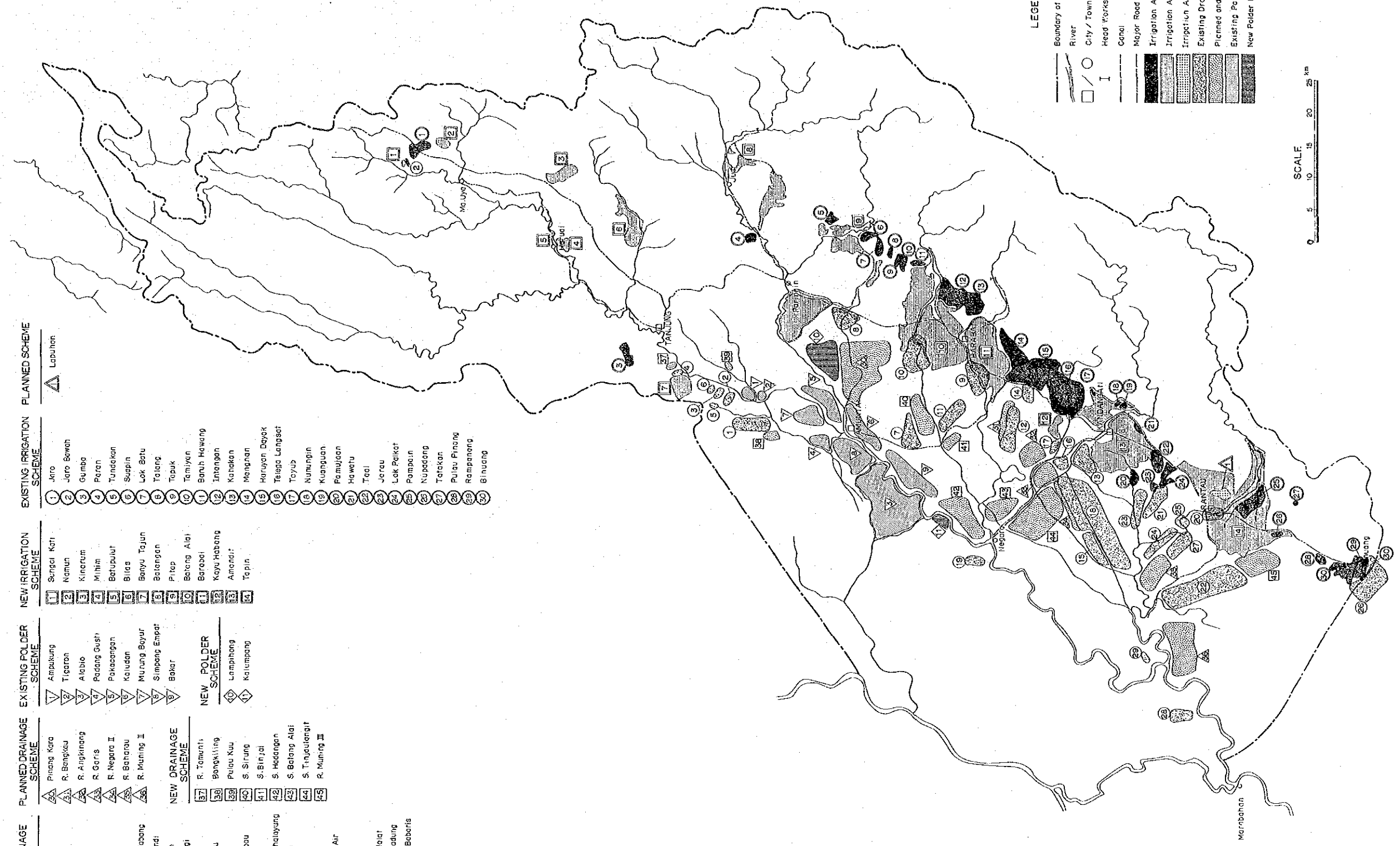


図-24 各小水系における月別水利用率

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 DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT  
 NEGARA RIVER BASIN OVERALL  
 IRRIGATION DEVELOPMENT PLAN STUDY  
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- |  |  |  |  |  |   |
|--|--|--|--|--|---|
| <b>EXISTING DRAINAGE SCHEME</b>  | <b>PLANNED DRAINAGE SCHEME</b>   | <b>EXISTING PALDER SCHEME</b>  | <b>NEW IRRIGATION SCHEME</b>   | <b>EXISTING IRRIGATION SCHEME</b>  | <b>PLANNED SCHEME</b>                                       |
| <ul style="list-style-type: none"> <li>1 S. Gamba</li> <li>2 S. Rampang</li> <li>3 S. Palat</li> <li>4 S. Pining</li> <li>5 S. Bintra</li> <li>6 S. Nanti</li> <li>7 S. Pinang Habang</li> <li>8 R. Batu Mandi</li> <li>9 Tp. Jaranah</li> <li>10 Tp. Semanggi</li> <li>11 R. Taras</li> <li>12 R. Bangkai</li> <li>13 Tp. Lungau</li> <li>14 Tp. Pangambu</li> <li>15 S. Kajang</li> <li>16 S. Tiga Behalayang</li> <li>17 S. Tahiran</li> <li>18 R. Negara</li> <li>19 S. Balum</li> <li>20 Sbh. Pintu Air</li> <li>21 S. Udui</li> <li>22 R. Muning</li> <li>23 S. Gers Halat</li> <li>24 S. Tapin Gadang</li> <li>25 S. Pinang Babaris</li> <li>26 R. Belanti</li> <li>27 S. Damar</li> <li>28 S. Setai</li> <li>29 S. Masang</li> </ul> | <ul style="list-style-type: none"> <li>30 Pinang Kara</li> <li>31 R. Bangkai</li> <li>32 S. Palat</li> <li>33 R. Angkrang</li> <li>34 R. Geris</li> <li>35 R. Negara II</li> <li>36 R. Baharu</li> <li>37 R. Muring I</li> <li>38 R. Batu Mandi</li> <li>39 Tp. Jaranah</li> <li>40 Tp. Semanggi</li> <li>41 R. Taras</li> <li>42 R. Bangkai</li> <li>43 Tp. Lungau</li> <li>44 Tp. Pangambu</li> <li>45 S. Kajang</li> <li>46 S. Tiga Behalayang</li> <li>47 S. Tahiran</li> <li>48 R. Negara</li> <li>49 S. Balum</li> <li>50 Sbh. Pintu Air</li> <li>51 S. Udui</li> <li>52 R. Muning</li> <li>53 S. Gers Halat</li> <li>54 S. Tapin Gadang</li> <li>55 S. Pinang Babaris</li> <li>56 R. Belanti</li> <li>57 S. Damar</li> <li>58 S. Setai</li> <li>59 S. Masang</li> </ul> | <ul style="list-style-type: none"> <li>1 Ampukung</li> <li>2 Tigaron</li> <li>3 Alabio</li> <li>4 Padang Gusti</li> <li>5 Pakacangan</li> <li>6 Kaludan</li> <li>7 Murung Boyur</li> <li>8 Simpang Empat</li> <li>9 Bakar</li> <li>10 Lampuhong</li> <li>11 Kalumpang</li> </ul> | <ul style="list-style-type: none"> <li>1 Sungai Kati</li> <li>2 Naman</li> <li>3 Kinrotit</li> <li>4 Minim</li> <li>5 Batupulit</li> <li>6 Bilas</li> <li>7 Benyu Tajun</li> <li>8 Belangan</li> <li>9 Pitap</li> <li>10 Batang Alai</li> <li>11 Baraboi</li> <li>12 Kayu Habang</li> <li>13 Amandi</li> <li>14 Tapin</li> </ul> | <ul style="list-style-type: none"> <li>1 Jaro</li> <li>2 Jaro Bawah</li> <li>3 Gumbo</li> <li>4 Peran</li> <li>5 Tundakan</li> <li>6 Supin</li> <li>7 Lok Batu</li> <li>8 Tolang</li> <li>9 Tapuk</li> <li>10 Tamiyen</li> <li>11 Baruh Hawang</li> <li>12 Intengan</li> <li>13 Kahakan</li> <li>14 Mengnan</li> <li>15 Haruyan Dayok</li> <li>16 Tesga Langsat</li> <li>17 Toyub</li> <li>18 Nunungin</li> <li>19 Kuanguan</li> <li>20 Pamujan</li> <li>21 Hawetu</li> <li>22 Teoi</li> <li>23 Jerau</li> <li>24 Lok Penkar</li> <li>25 Pomboun</li> <li>26 Nupadong</li> <li>27 Teteakan</li> <li>28 Pulau Pinang</li> <li>29 Rampenong</li> <li>30 Binuang</li> </ul> | <ul style="list-style-type: none"> <li>△ Lapuhon</li> </ul> |



**LEGEND**

- Boundary of the Study Area
- River
- City / Town
- Head Works
- Canal
- Major Road
- Irrigation Area (Existing)
- Irrigation Area (New)
- Irrigation Area (Planned)
- Existing Drainage Project
- Planned and New Drainage Project
- Existing Palder Project
- New Palder Project

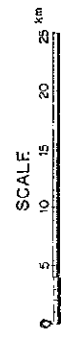


图-25 候補個別計画位置图

REPUBLIC OF INDONESIA  
 DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT  
 NEGARA RIVER BASIN OVERALL  
 IRRIGATION DEVELOPMENT PLAN STUDY  
 JAPAN INTERNATIONAL COOPERATION AGENCY





Project	Repelita V (1989/90-93/94)	Repelita VI (1994/95-98/99)	Repelita VII + VIII (1999/00-08/09)	Repelita IX + X (2009/10-18/19)
<b>FEASIBILITY STUDY</b>				
1. Negara Pilot Project	■			
2. Negara Irrigation and Drainage Upgrading Project	■			
3. Upper Negara Agricultural Development Project		■		
4. Lower Negara Agricultural Development Project		■		
<b>INVESTMENT PLAN</b>				
1. Negara Pilot Project	—————▶			
2. Negara Irrigation and Drainage Upgrading Project	—————			
3. Upper Negara Agricultural Development Project	—————			
4. Lower Negara Agricultural Development Project	—————			

図 - 26 実施計画

REPUBLIC OF INDONESIA  
DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT  
**NEGARA RIVER BASIN OVERALL  
IRRIGATION DEVELOPMENT PLAN STUDY**  
JAPAN INTERNATIONAL COOPERATION AGENCY



## 付属資料



SCOPE OF WORK  
FOR  
NEGARA RIVER BASIN OVERALL IRRIGATION DEVELOPMENT PLAN STUDY  
IN  
THE REPUBLIC OF INDONESIA

AGREED UPON  
BETWEEN

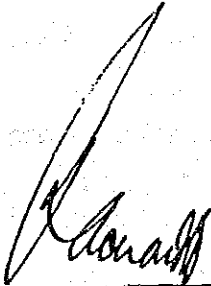
DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT

MINISTRY OF PUBLIC WORKS

A N D

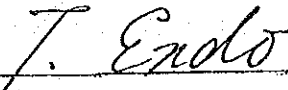
JAPAN INTERNATIONAL COOPERATION AGENCY

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## I. INTRODUCTION

In response to the request of the Government of the Republic of Indonesia, the Government of Japan has decided to conduct Negara River Basin Overall Irrigation Development Study (hereinafter referred to as " The Study ") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as " JICA "), the official agency responsible for the implementation of technical cooperation programmes of the Government of Japan, will undertake the Study in close cooperation with the authorities of Indonesia.

The Directorate General of Water Resources Development, the Ministry of Public Works, Indonesia, (hereinafter referred to as " DGWRD ") shall act as counterpart agency to the Japanese study team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

The present document sets forth the scope of work with regard to the above-mentioned Study.

## II. OBJECTIVES OF THE STUDY

The objectives of the Study are :

- (1) To formulate a plan on the Negara River Basin Overall Irrigation Development in South Kalimantan, and
- (2) To make technology transfer to the Indonesian counterpart personnel in the course of the Study.

## III. SCOPE OF THE STUDY

### 1. Study Area

The Study covers a planned area of about 11.500 Km<sup>2</sup> of the whole Negara River Basin and its affected area in South Kalimantan.

## 2. Contents of the Study

The Study will be composed of three phases as follows;

Phase - I Collection, review and analysis of relevant data and Information on the whole Negara River Basin.

### A) Natural conditions

- a. Topography
- b. Meteorology and Hydrology
- c. Geology and Hydrogeology
- d. Pedology
- e. Inundation and Flood
- f. Upper Watershed Management and critical land.

### B) Social and economic conditions

- a. Population
- b. Social organization
- c. Regional and national developmnet programmes
- d. Rural economy
- e. Social infrastructure
- f. Water usage facilities
- g. Others such as inland navigation and transmigration

### C) Agricultural conditions

- a. Land Use
- b. Land tenure
- c. Irrigation and Drainage
- d. Farming and Cropping
- e. Inland fishery
- f. Agro-economy
- g. Processing, Marketing and Transportation
- h. Agricultural organization.

Phase - II Supplemental Survey and Formulation of a Basic Development Plan

- A) Supplemental survey in Indonesia based on the results of Phase-I study
- B) Identification and evaluation of the development potentials in the area
- C) Formulation of a basic development plan

Phase - III Formulation of the Overall Irrigation Development Plan

The Overall Irrigation Development Plan in the Negara River Basin will be formulated, taking into consideration the following components;

- a. Irrigation and drainage system
- b. Preliminary design for irrigation and drainage facilities
- c. Operation and maintenance system
- d. Land reclamation
- e. Water demand and supply (including drinking water)
- f. Mini-hydro electric power development sub-projects
- g. General layout of development sub-projects
- h. Prioritization of development sub-projects
- i. Project evaluation
- j. Environmental impact evaluation

#### IV. STUDY SCHEDULE

The whole study shall be conducted within 17 months as in the attached tentative schedule.



## V. R E P O R T S

JICA shall prepare and submit the following reports in English to the Government of Indonesia.

1. Inception Report  
Thirty (30) copies at the beginning of Phase-I study in Indonesia.
2. Field Report (I)  
Thirty (30) copies at the end of the field survey of Phase-I study
3. Progress Report  
Thirty (30) copies at the beginning of the field survey of Phase-II study.
4. Field Report (II)  
Thirty (30) copies at the end of the field survey of Phase-II study
5. Interim Report  
Thirty (30) copies at the end of Phase-II study.
6. Field Report (III)  
Thirty (30) copies at the end of the field survey of Phase-III study.
7. Draft Final Report  
Fifty (50) copies at the end of Phase-III study  
The Government of Indonesia shall, if any, present comments on the Draft Final Report to JICA within one (1) month after receiving the Draft Final Report.
8. Final Report  
Fifty (50) copies within one (1) month after receipt of comments on the draft Final Report.

## VI. UNDERTAKING OF THE GOVERNMENT OF INDONESIA

1. To facilitate smooth conduct of the Study, the Government of Indonesia will take necessary measures :
  - (1) To secure the safety of the Japanese study Team,
  - (2) To permit the members of the Japanese Study Team to enter, leave and sojourn in Indonesia for the duration

of their assignment therein, and exempt them from alien registration requirements and consular fees,

- (3) To exempt the members of the Japanese Study Team from taxes, duties, fees and any other charges on equipment machinery and other materials brought into Indonesia for the conduct of the Study,
- (4) To exempt the members of the Japanese Study Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese Study Team for their services in connection with the implementation of the Study,
- (5) To provide necessary facilities to the Japanese Study Team for the remittances as well as the utilization of the funds introduced into Indonesia from Japan in connection with the implementation of the Study,
- (6) To secure permission to take all data and documents related to the Study out of Indonesia to Japan by the Japanese Study Team,
- (7) To provide medical services as needed. Its expenses will be chargeable on the members of the Japanese Study Team.

2. The Government of Indonesia shall bear claims, if any arises, against the members of the Japanese Study Team arising from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Japanese Study Team.

3. DGWRD shall, at its own expenses, provide the Japanese Study Team with the following, in cooperation with other agencies concerned, if necessary;

- (1) Available data and information related to the Study,
- (2) Counterpart personnel,
- (3) Suitable offices with necessary equipment, in Banjarmasin and the Study area,
- (4) Credentials or identification cards.

4. DGWRD will assist the Japanese Study Team to arrange accommodations.

#### VII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take following measures :

- (1) To dispatch, at its own expense, study teams to Indonesia
- (2) To pursue technology transfer to the Indonesian counterpart personnel in the course of the Study in Indonesia as well as in Japan.
- (3) To provide equipment and materials necessary for the Study.

#### VIII. OTHERS

JICA and DGWRD will consult with each other in respect of any matter that may arise from or in connection with the Study.

TENTATIVE SCHEDULE

Phase	Phase I						Phase II					Phase III				
(ten Month)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
WORK IN INDONESIA	=====						=====					=====				
WORK IN JAPAN	□					□				□		□				
REPORTS	△ Inc.R		△ F/R(I)			△ P.R.				△ F/R(II)	△ Int.R	△ F/R(III)		△ D.F.R.		△ F.R

(Remarks) Inc.R.: Inception Report      P.R.: Progress Report  
 Int.R.: Interim Report      D.F.R.: Draft Final Report  
 F.R. : Final Report      F/R : Field Report  
 © Comments on D.F.R. by Indonesian side

===== : Field Work  
 □ : Home Office Work







JICA