

付 図

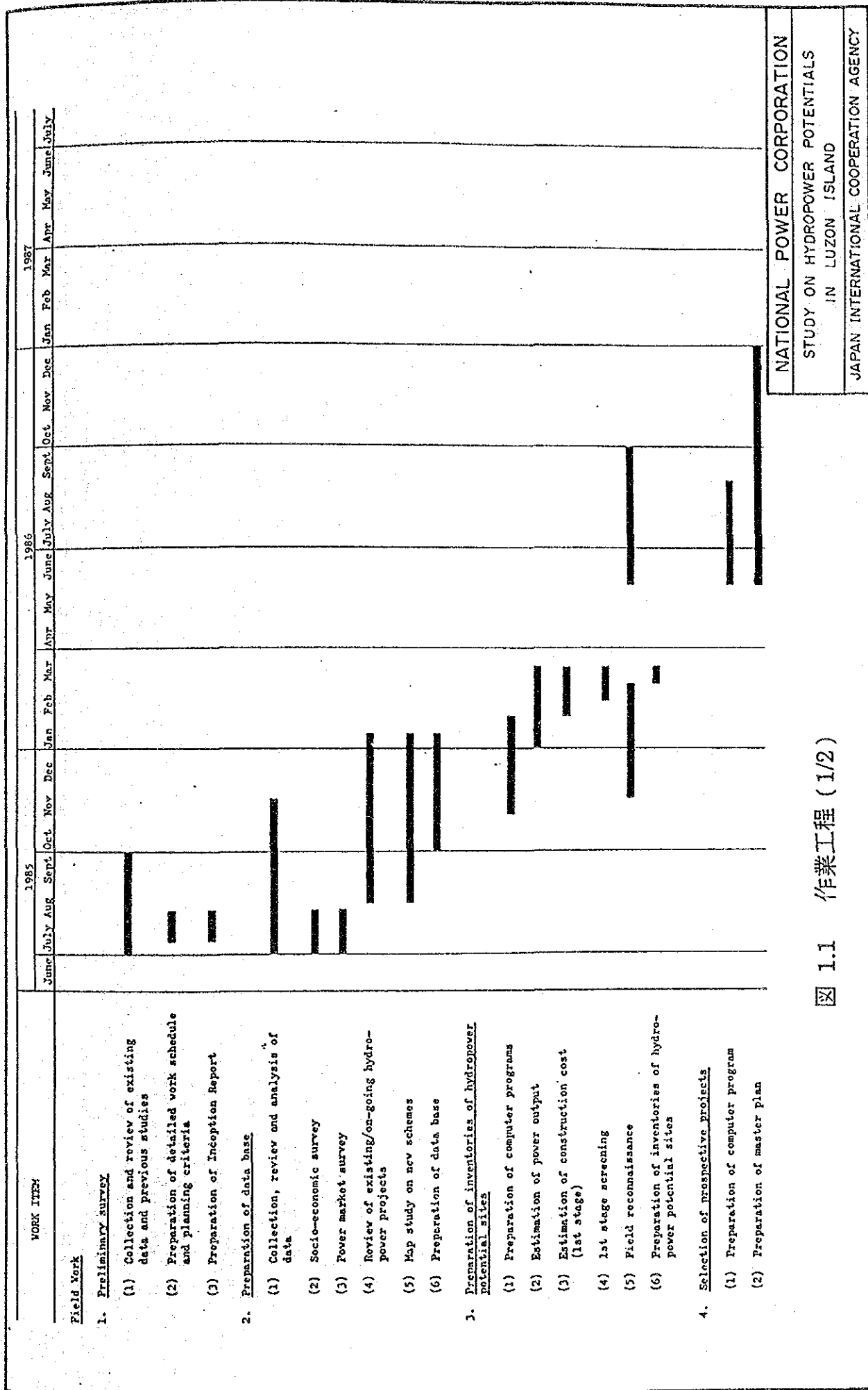


図 1.1 作業工程 (1/2)

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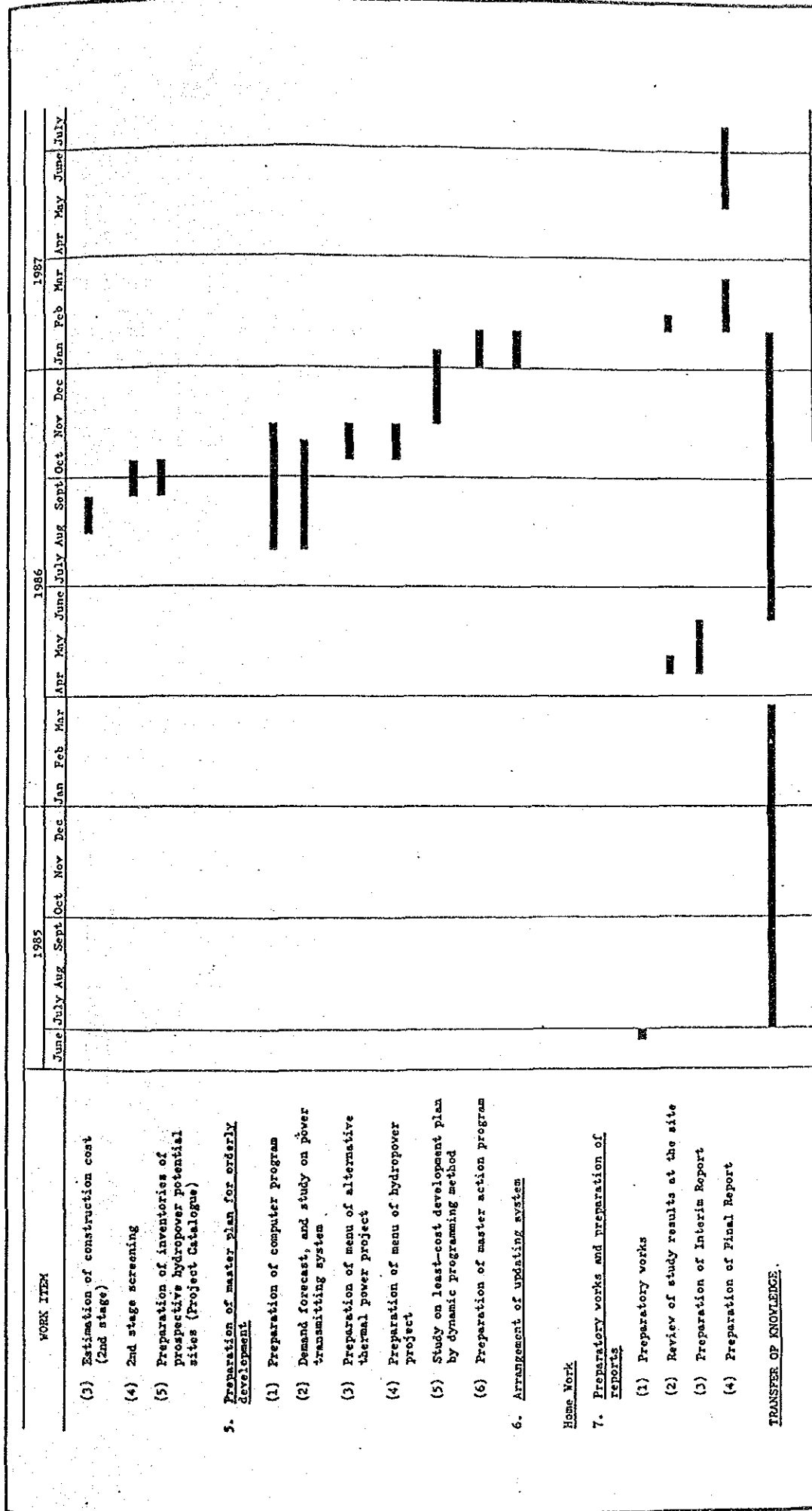


図 1.1 作業工程 (2/2)

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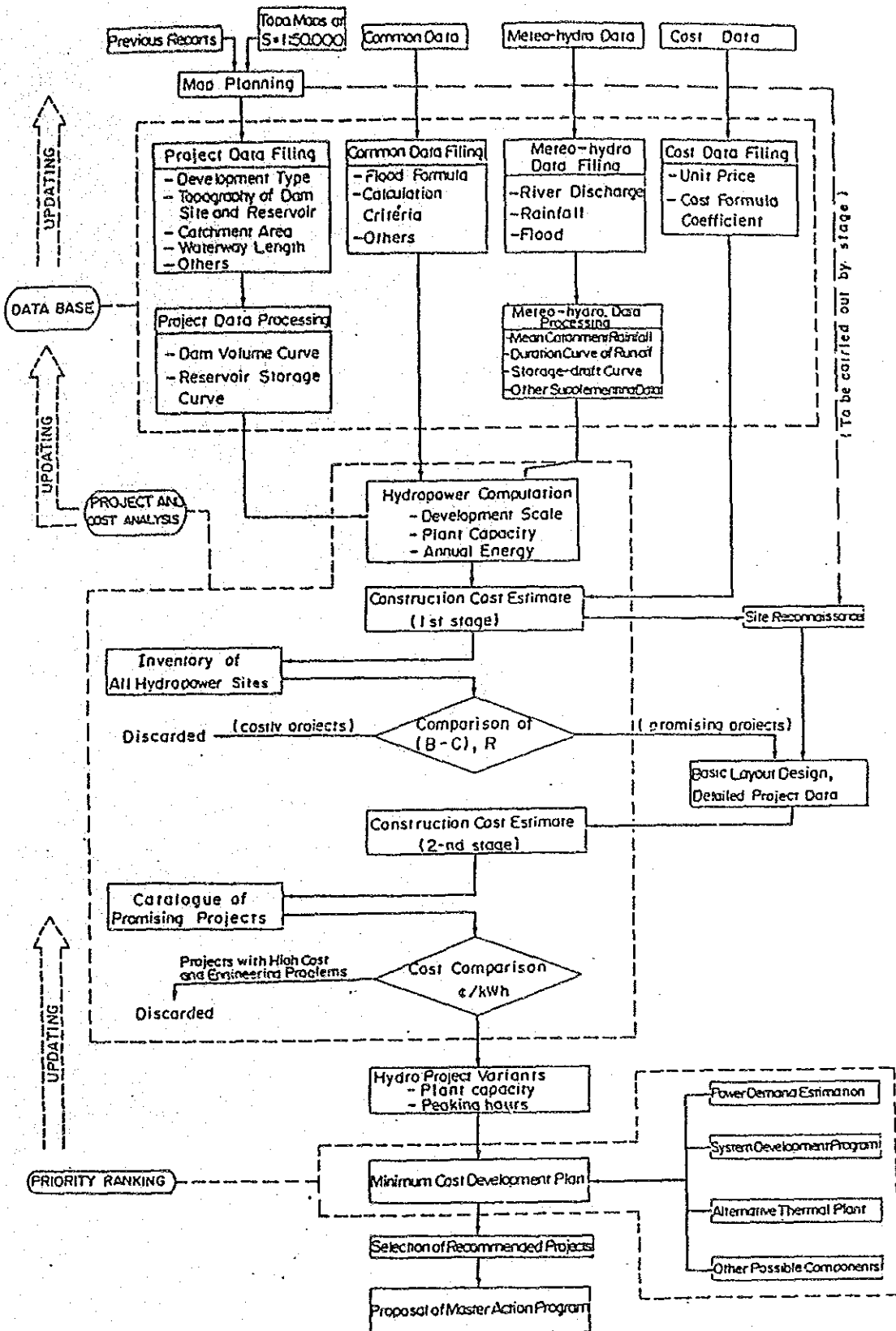


図 2.1 全体作業の流れ図

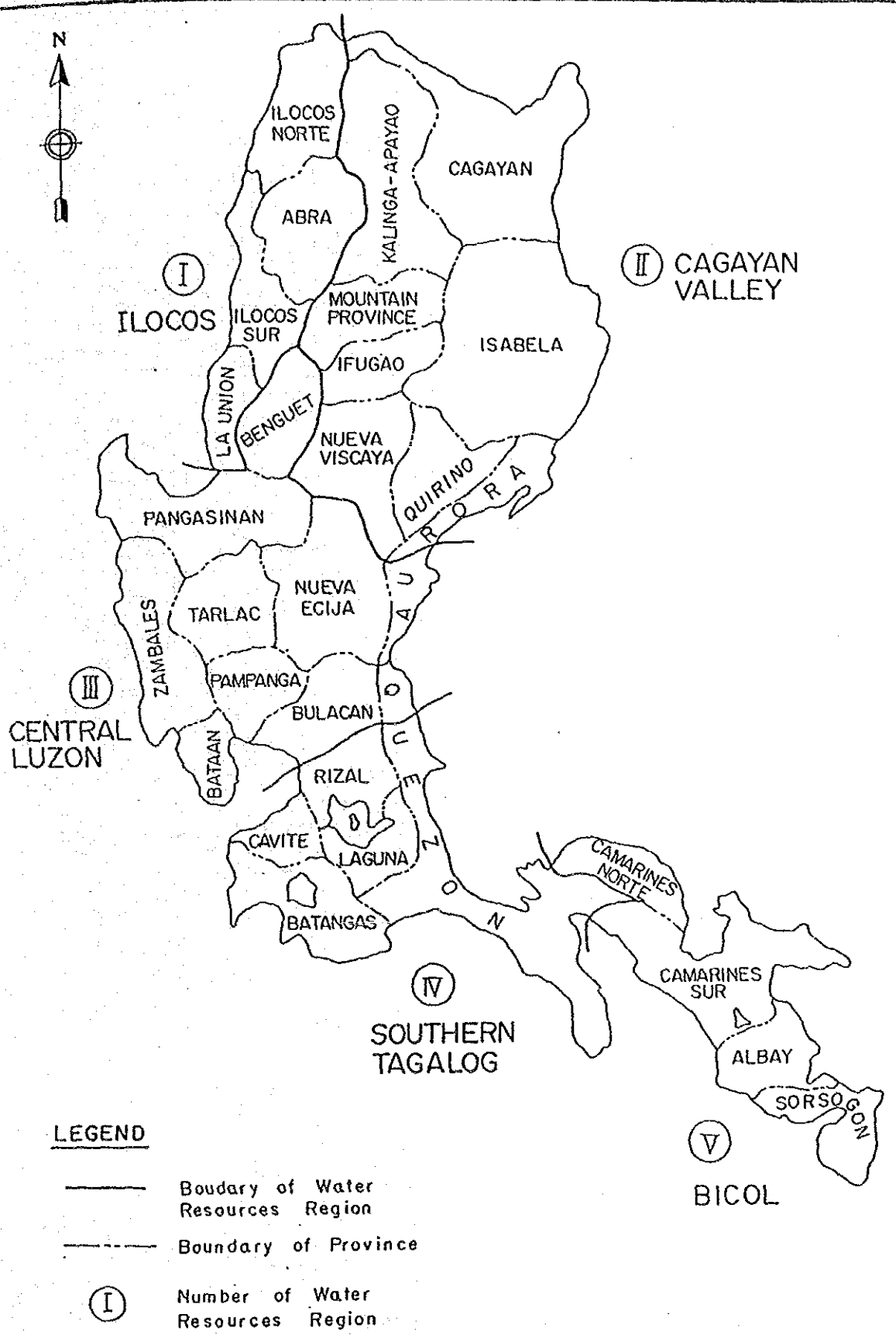
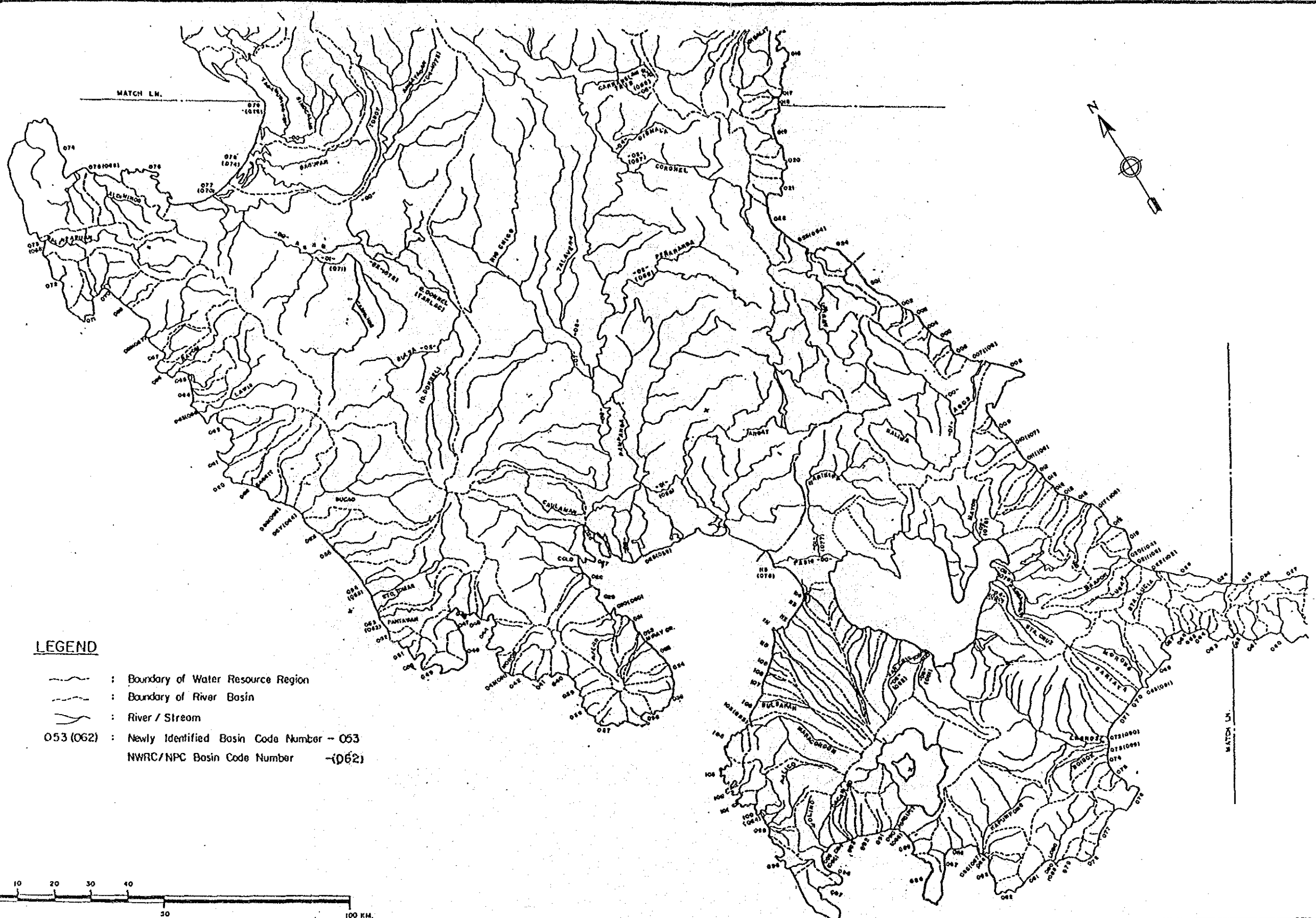


図 2.2 スタディ・エリアの区分図

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LEGEND

- : Boundary of Water Resource Region
- : Boundary of River Basin
- : River / Stream
- 053 (062) : Newly Identified Basin Coda Number - 053
NWRC/NPC Basin Code Number - (062)

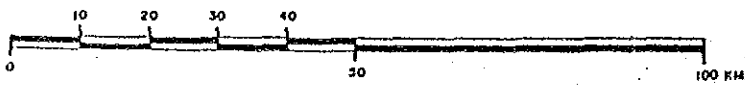
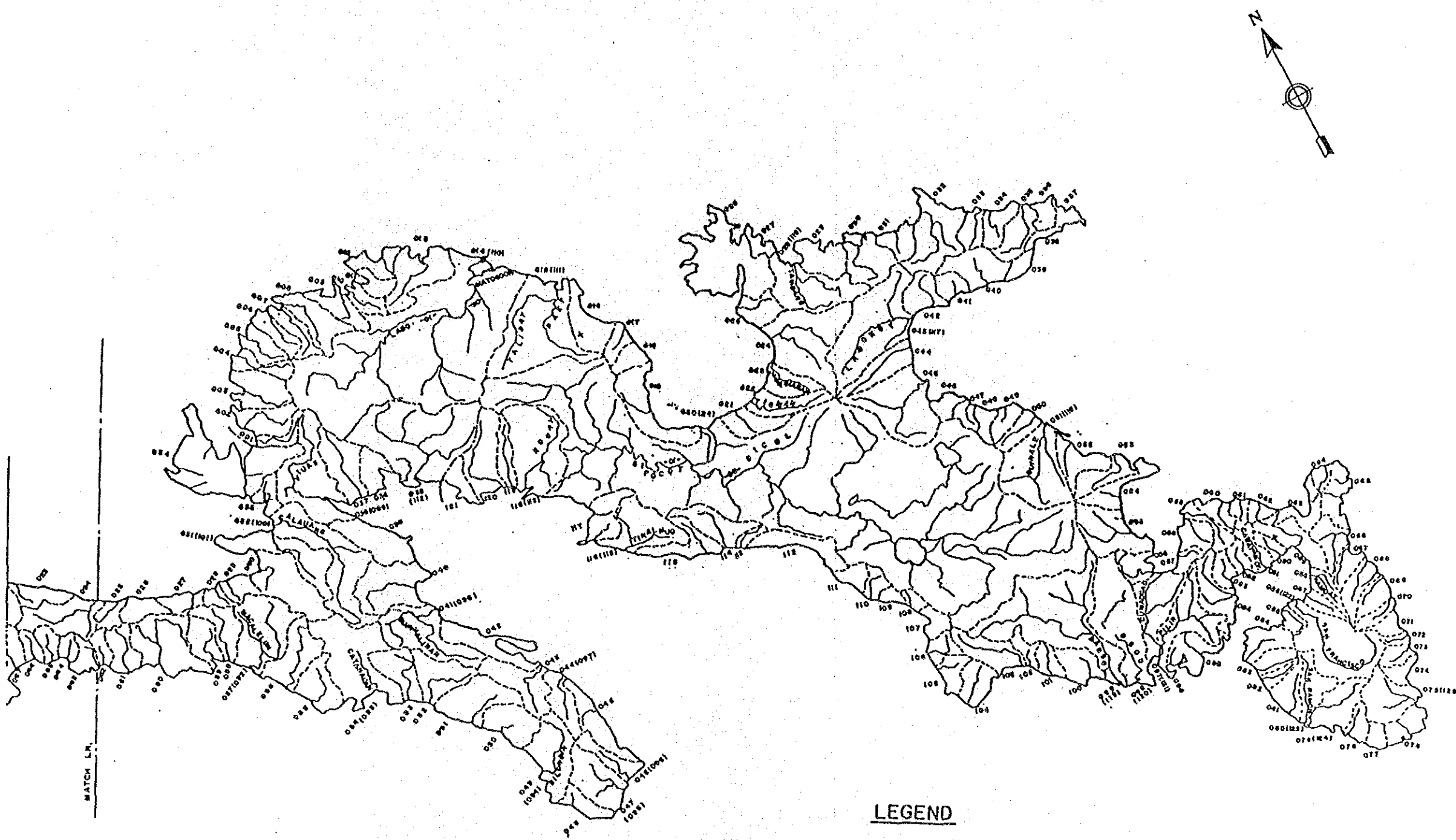


図 2.3 ルソン島の流域・河川の区分図 (2/3)

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LEGEND

- ; Boundary of Water Resources Region
- - - ; Boundary of River Basin
- ; River / Stream
- 099(119) ; Newly Identified Basin Code Number - 099
- ; NWRC/NPC Basin Code Number - (119)

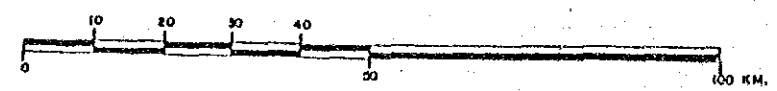


図 2.3 ルソン島の流域・河川の区分図 (3/3)

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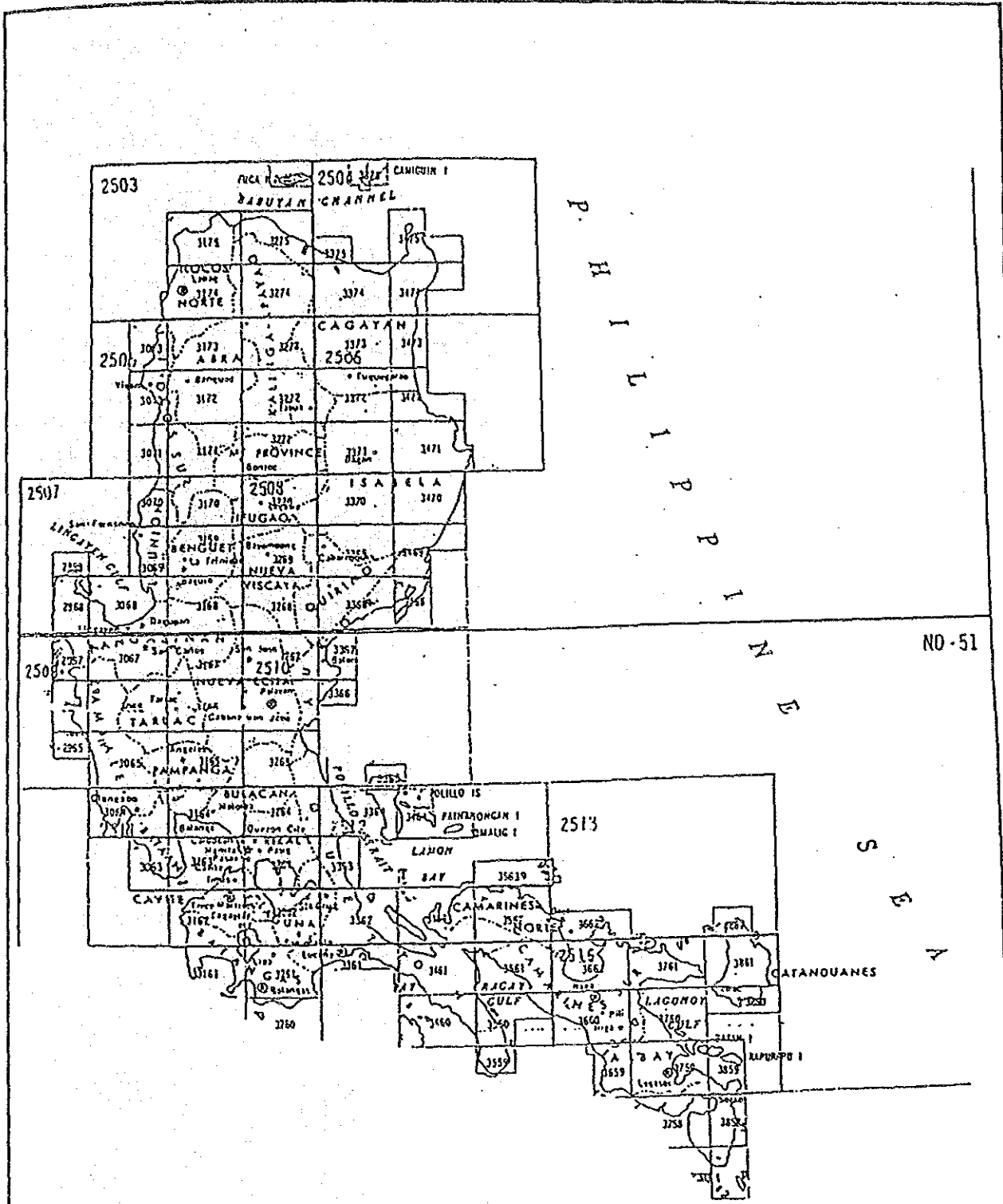


図 3.1 地形図のインデックス・マップ

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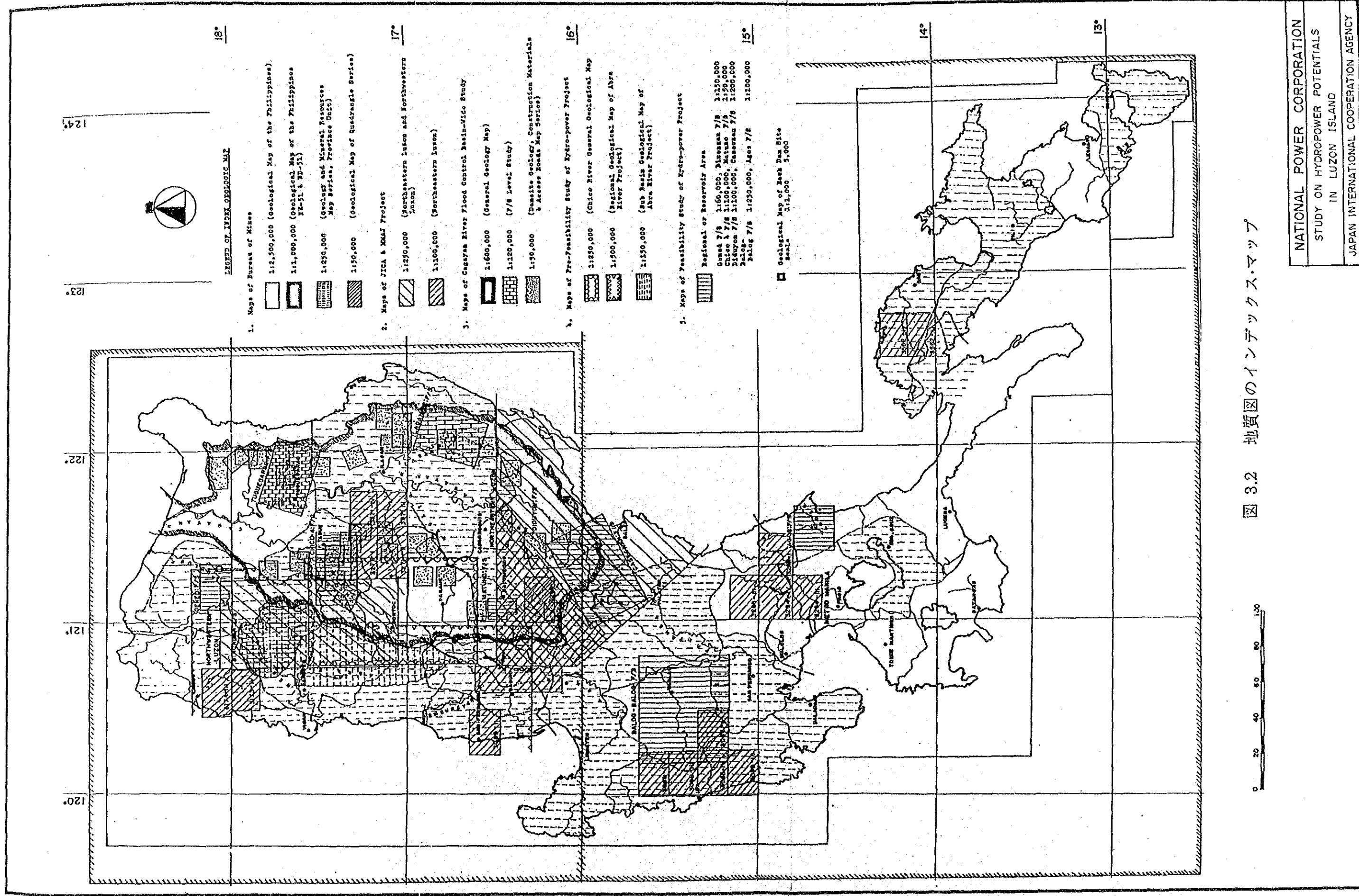


図 3.2 地質図のインデックス・マップ

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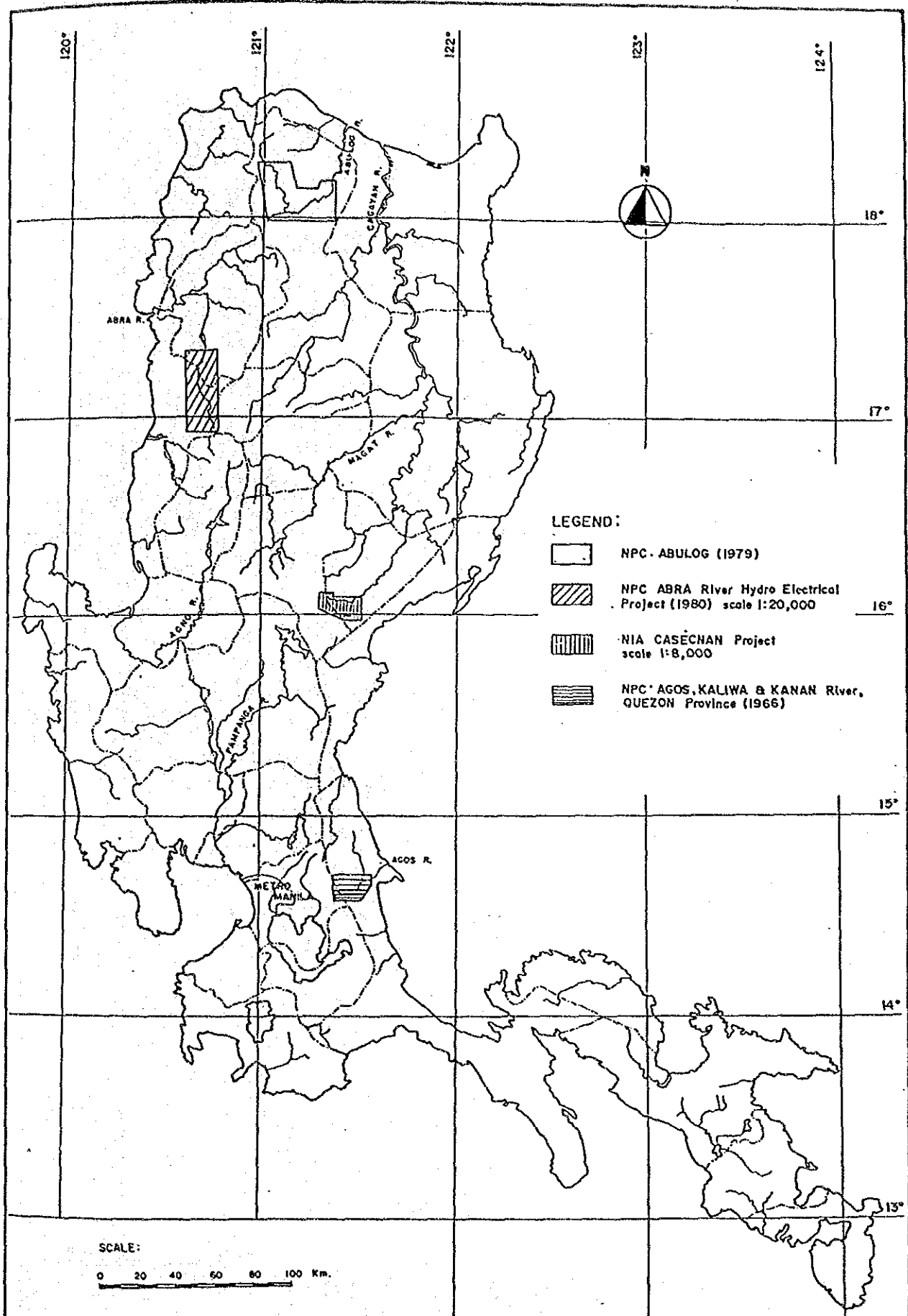


図 3.3 航空写真のインデックス・マップ

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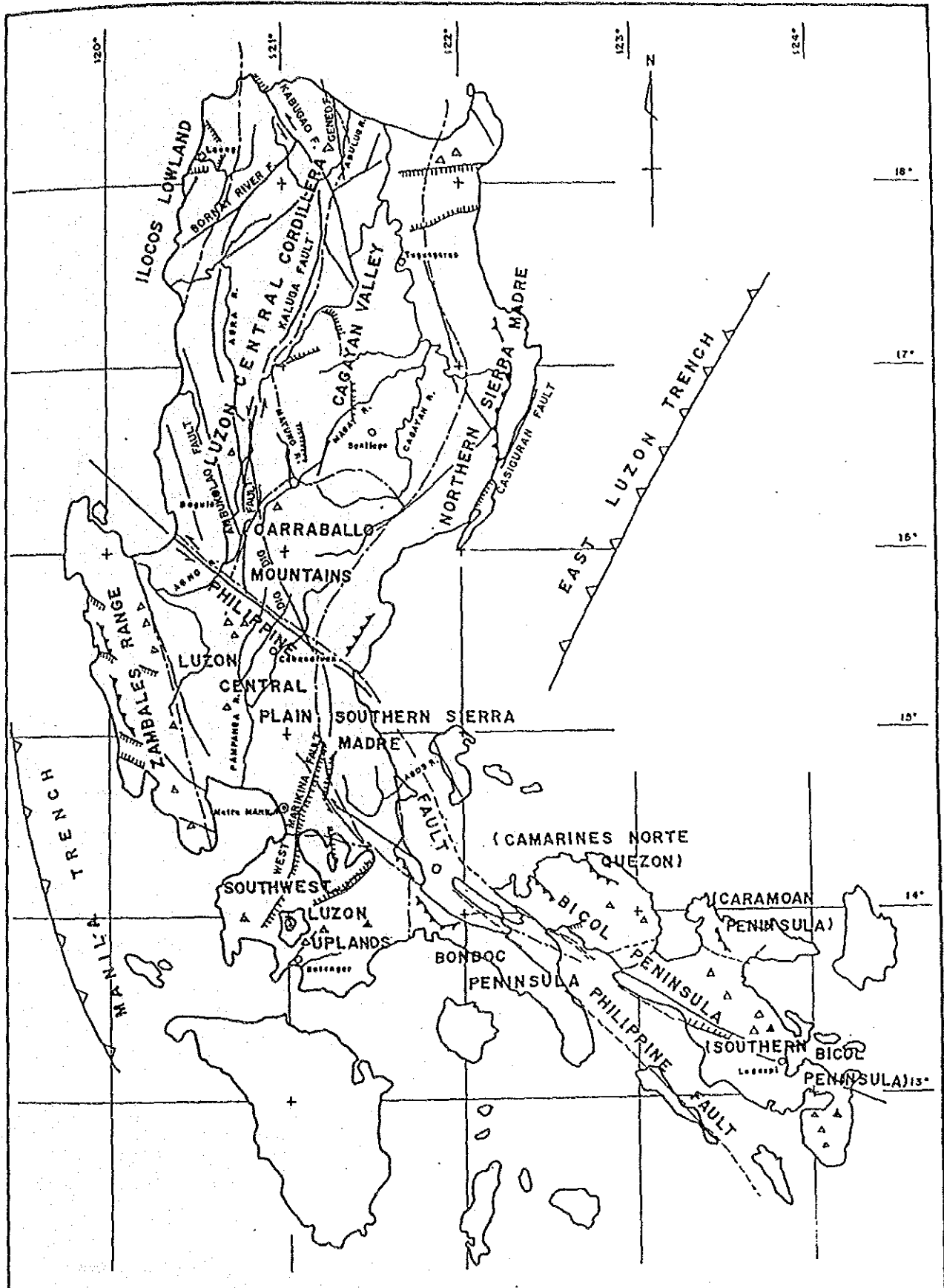
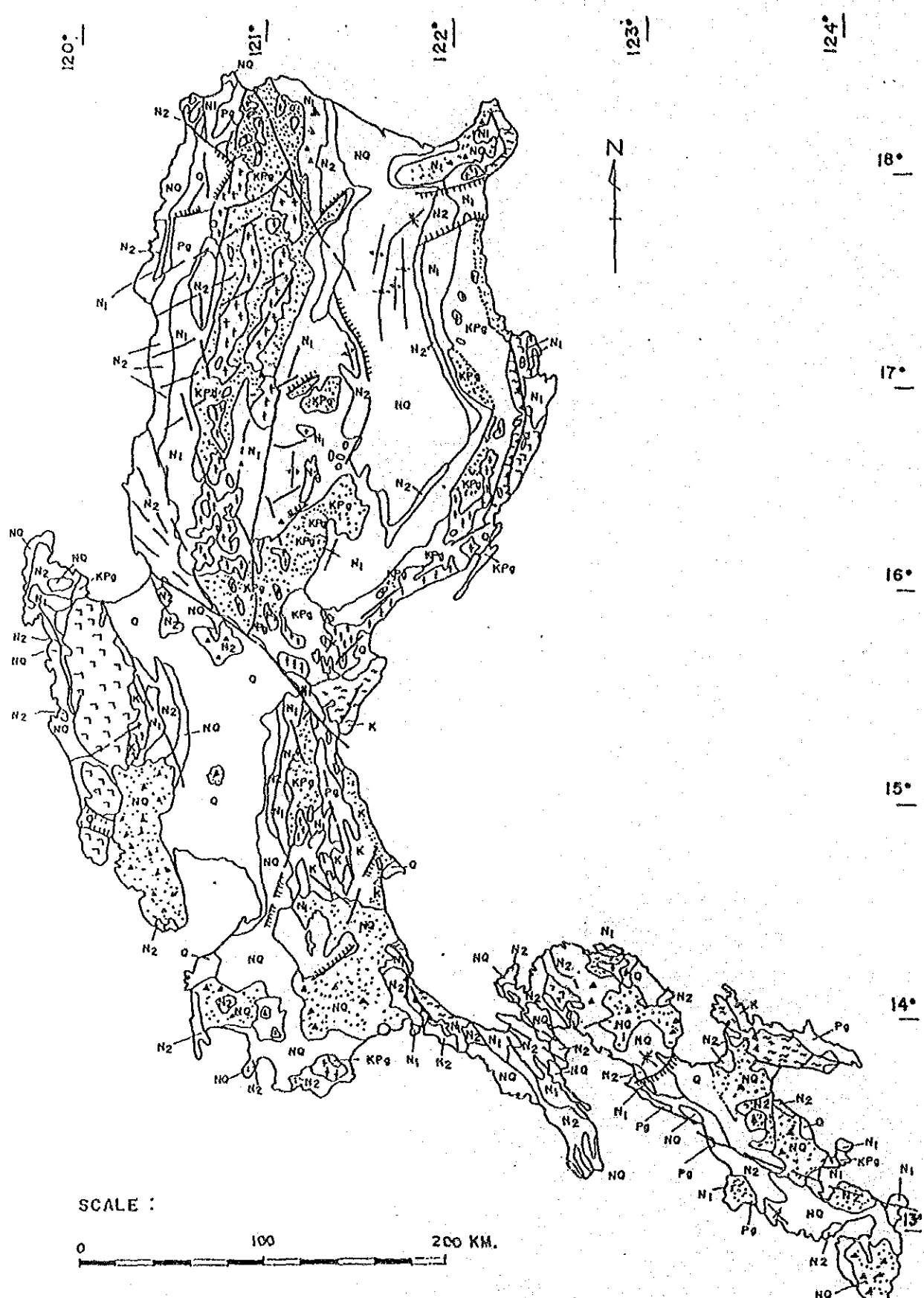


図 3.4 ルソン島の地形・地質区分図

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
SCALE :
0 100 200 KM.

Adopted from : GEOLOGICAL MAP OF THE PHILIPPINES,
Bureau of Mines.


LEGEND

| | | Age | Map Symbol | Sedimentary Rocks | Map Symbol | Volcanic Rocks | |
|----------------------|-------------|-----|------------|---|---|--|--|
| QUATERNARY | Recent | | Q | Quaternary alluvial, lacustrine, beach and residual deposits. | ▲ | Quaternary volcanics | |
| | Pleistocene | | | Marine and terrestrial sediments, includes extensive reef limestone and water-laid pyroclastics | NQ | Volcanic deposits. Mostly andesites and basalts with associated dacites and rhyodacites in places. | |
| | Pliocene | | NQ | | | | |
| CEZOZOIC TERTIARY | Miocene | | N2 | Largely marine clastics reef limestone. | N2 | Andesite-basaltic pyroclastics and lavas, dacite. | |
| | Oligocene | | N1 | Mainly marine sandstone shale and limestone some conglomerate | N1 | Mainly dacite and andesite lavas and pyroclastics | |
| | Eocene | | Pg | Mainly marine sandstone graywacke shale and limestone. | Pg | Marine andesite lavas pyroclastics | |
| | Paleocene | | | | Metasediments consisting mainly of largely graywacke and shale. | KPg | Metavolcanics, largely spilites and basalts. |
| | | | | KPg | | | |
| MESOZOIC | Cretaceous | | K | Chert, plagic to hemi-pelagic sediments, turbidites, limestone and graywacke shale. | K | Spilitic to non-spilitic basalt andesite | |

Intrusive and Basic Rocks

- Tertiary  Intermediate to acid; mainly diorite, granodiorite, quartz diorite and monzonite, tonalite, adamellite, gabbro, syenite and granite and localized facies.
- Cretaceous-paleogene  Basic and ultrabasic; mainly peridotite, dunite and layered gabbro; peridotite and dunite are generally serpentinized; troctolite, norite, trond; hemite.

Metamorphic Rocks

- Pre-Jurassic  Schist, phyllite, gneiss, marble and quartzite ranging from the greenschist to pyroxenite facies.

STRUCTURAL SYMBOLS








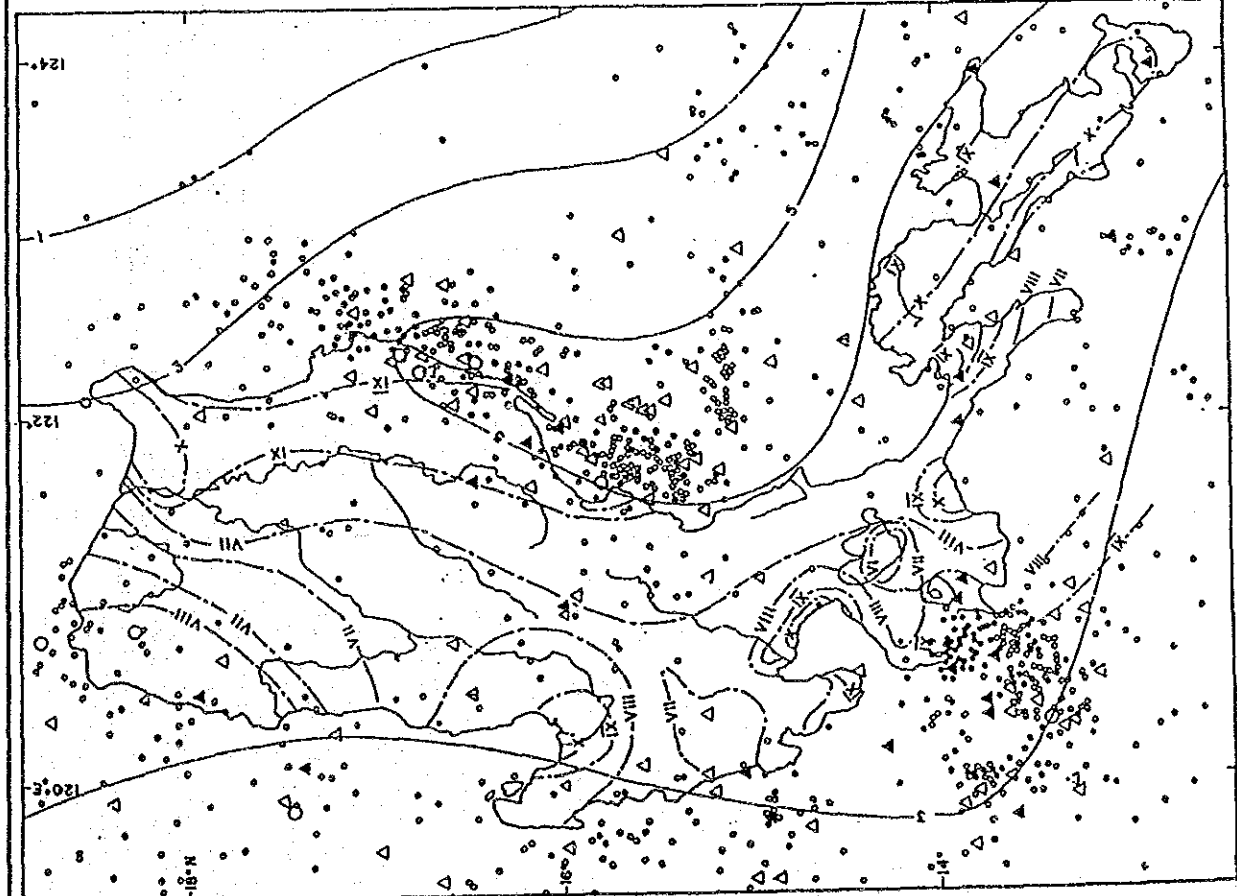
-  High-angle fault
-  Normal fault, hachures on downthrown side
-  Thrust fault, saw-teeth on overriding
-  Boundary of lithologic unit
-  Anticlinal axis
-  Synclinal axis
-  Quaternary volcanic center

図 3.5 ルソン島の地質図

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LEGEND

| EARTHQUAKE EPICENTERS | |
|-----------------------|---------------------------|
| DEPTH OF FOCUS | 4-5.9 6-7.9 UNKNOWN |
| 0-70 km. | • ○ △ |
| 70-300 km. | • ● ▲ |
| Unknown | † ϕ △ |

MAXIMUM OBSERVED INTENSITY
 ROMAN NUMBER (VII-X) INDICATE INTENSITY

SEISMIC FLUX CONTOUR
 — IN UNITS OF 10^4 ergs $\text{Km}^2 \text{yr}^{-1}$

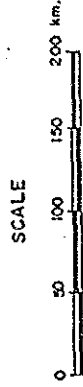


图 3.6 地震图

Adapted from: SEISMOTECTONIC MAP OF THE PHILIPPINES
 (SOUTHEAST ASIA ASSOCIATION OF SEISMOLOGY AND EARTHQUAKE
 ENGINEERING, 1965)

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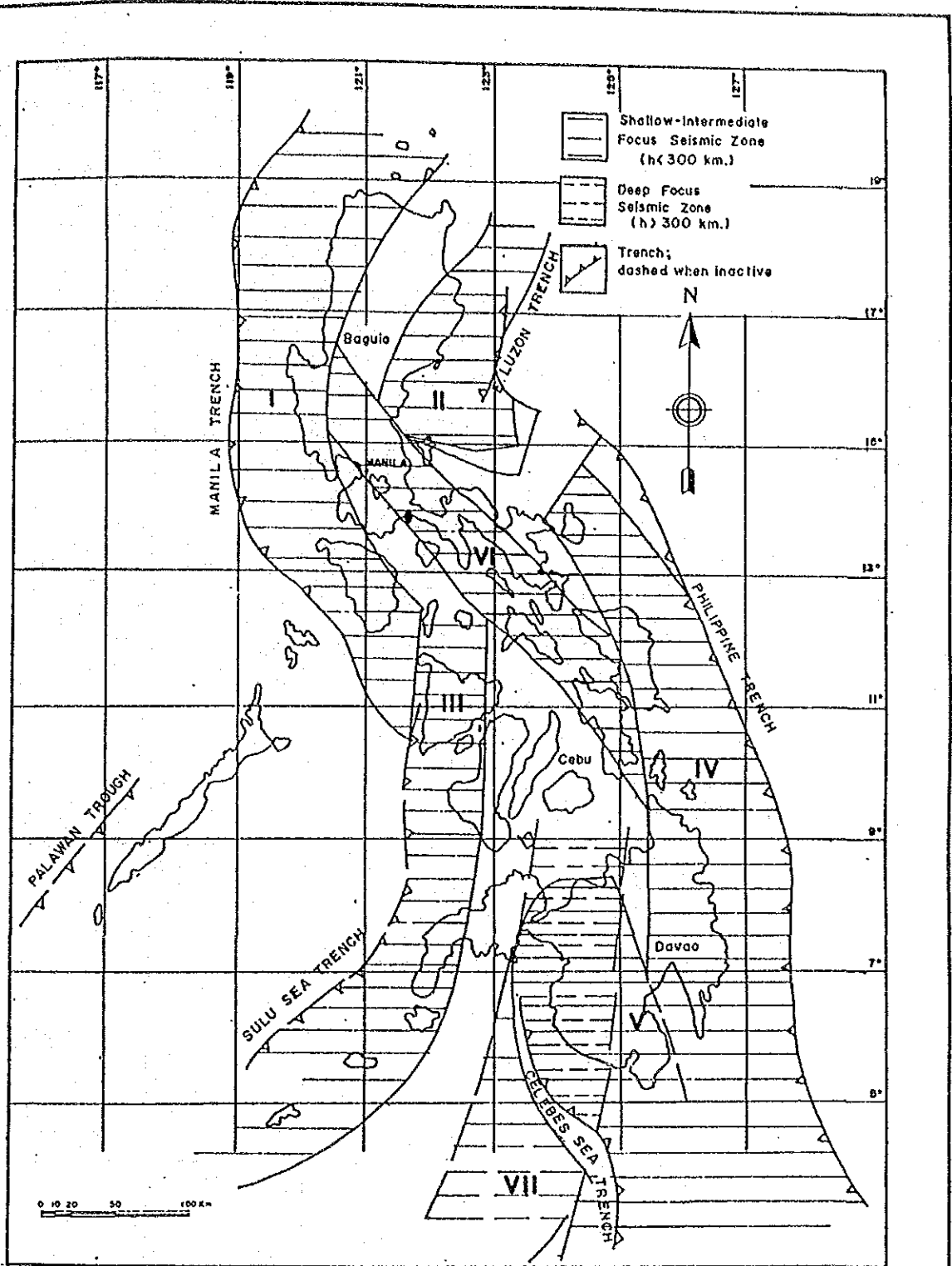


図 3.7 フィリピン全島の震源分布図

From: BMG (1981) GEOLOGY and MINERAL RESOURCES of the PHILIPPINES

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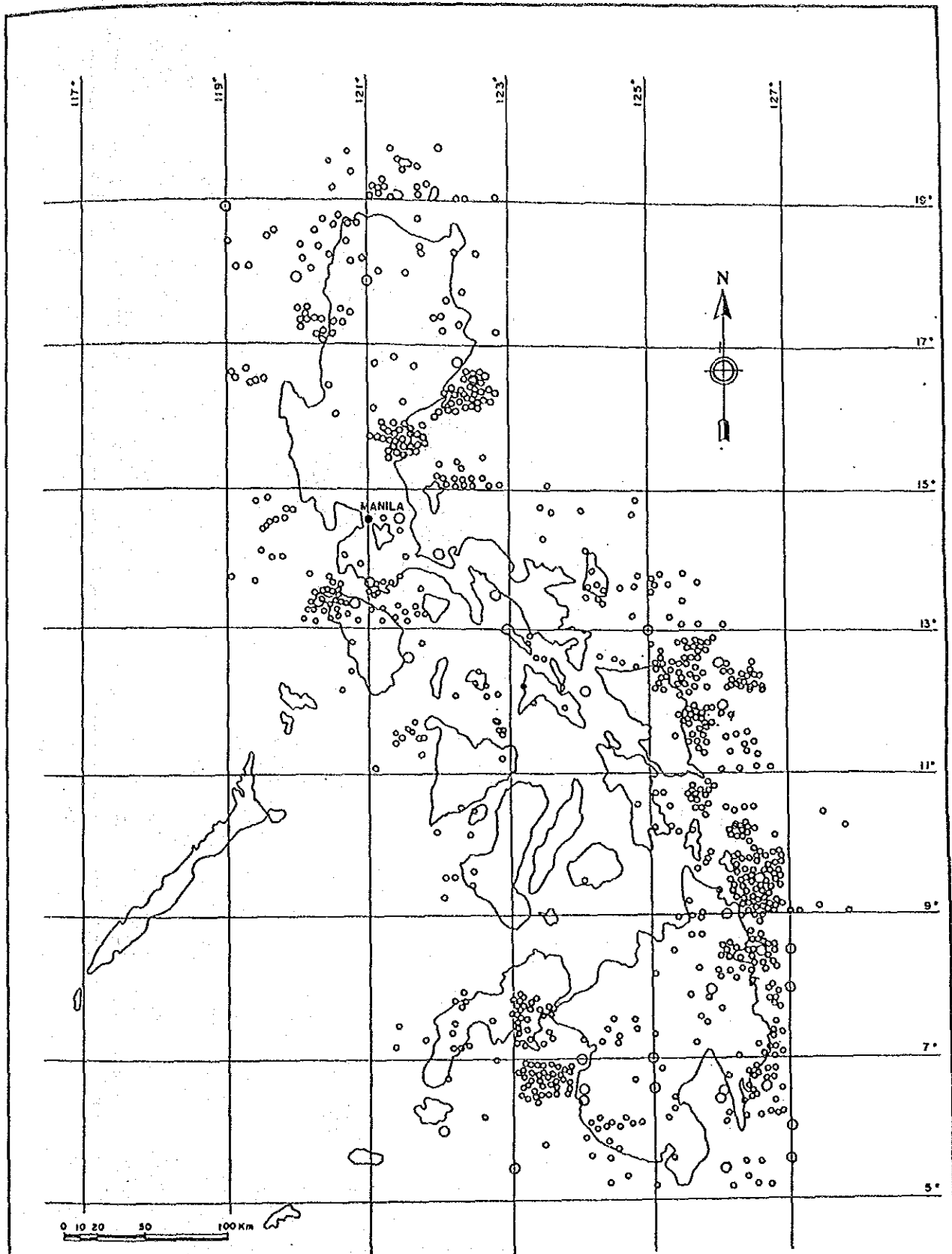


図 3.8 フィリピン全島の地震分布図

Legend :
 ○ $M \geq 7$
 ● $7 > M \geq 5$

From: NOAA EARTHQUAKE MAGNET TAPE
 DATA FILE (1655-1978) $M \geq 5, h < 70$

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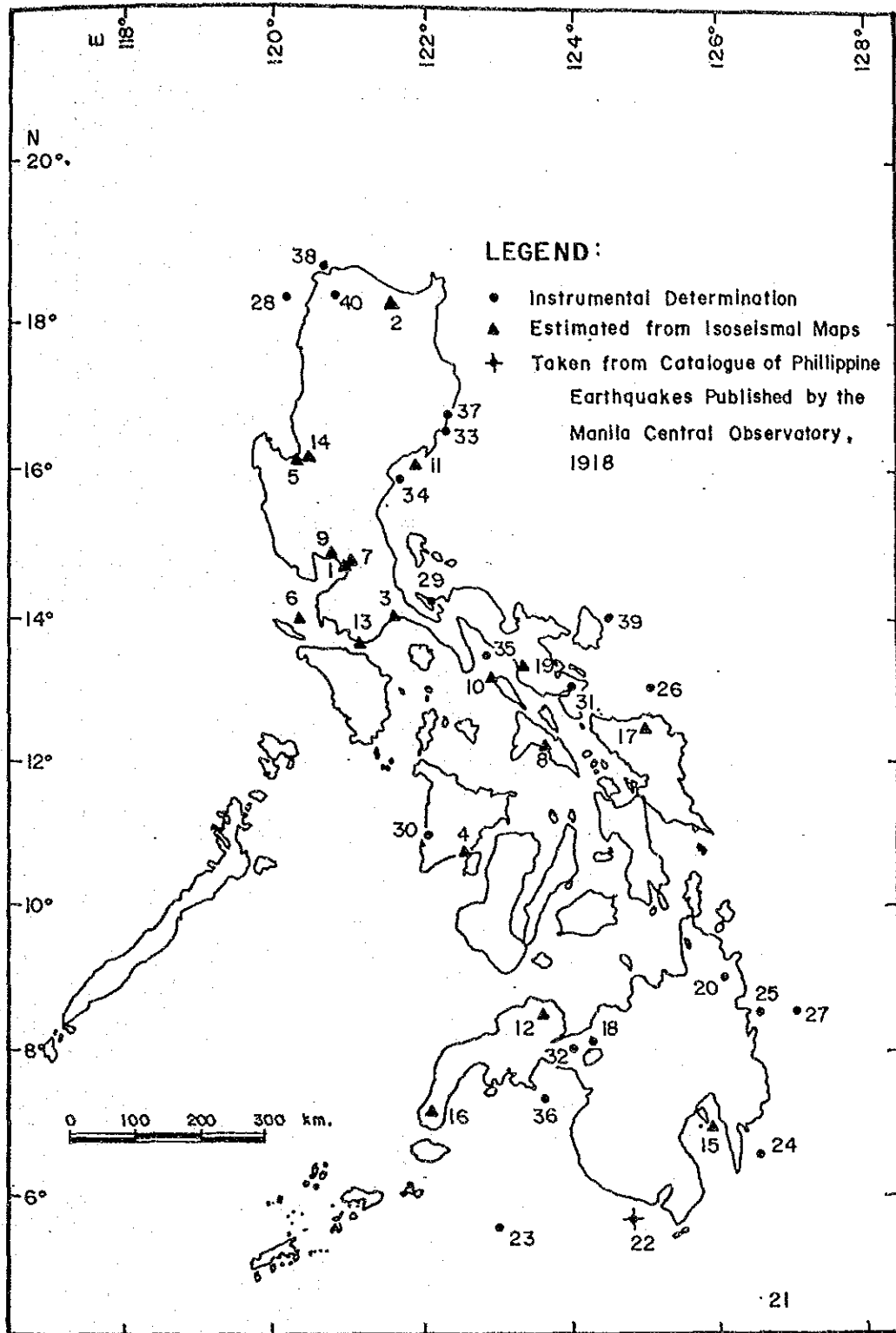


図 3.9 既往大地震の分布図

After L. C. Rolando, et al (SEASEE, Series on Seismology volume IV, Philippines 1985)

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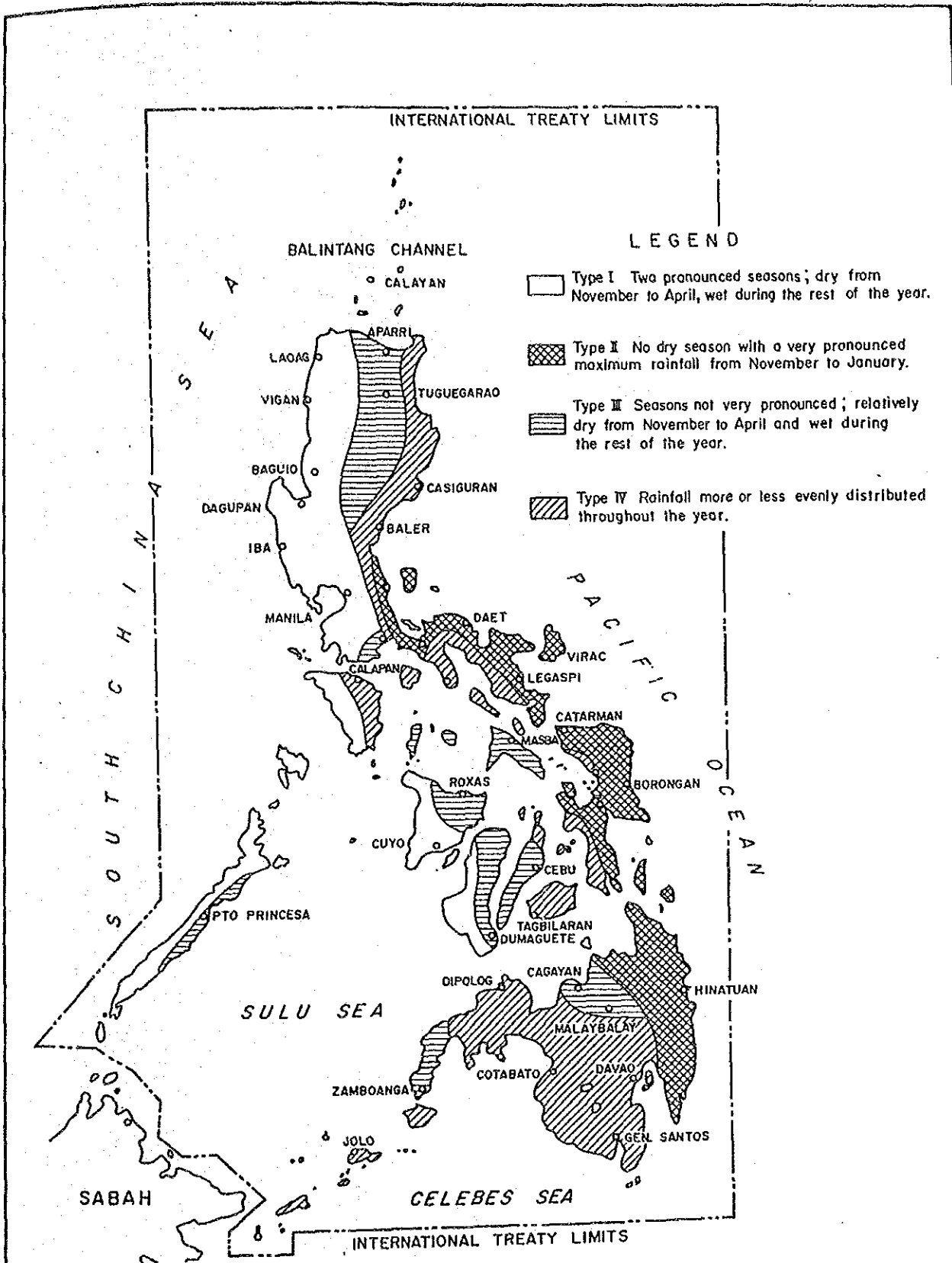


図 4.1 フィリピン気候区分

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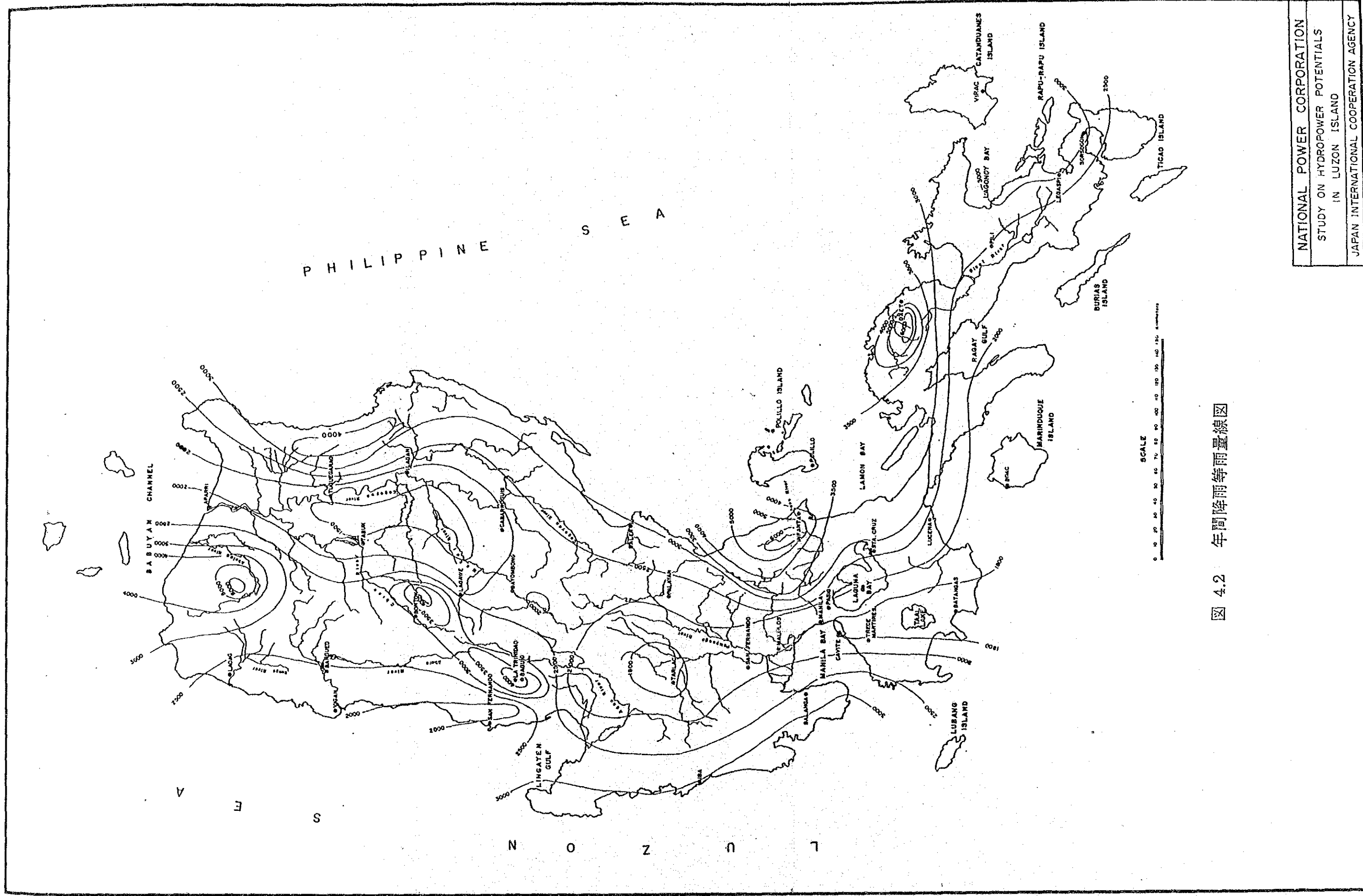
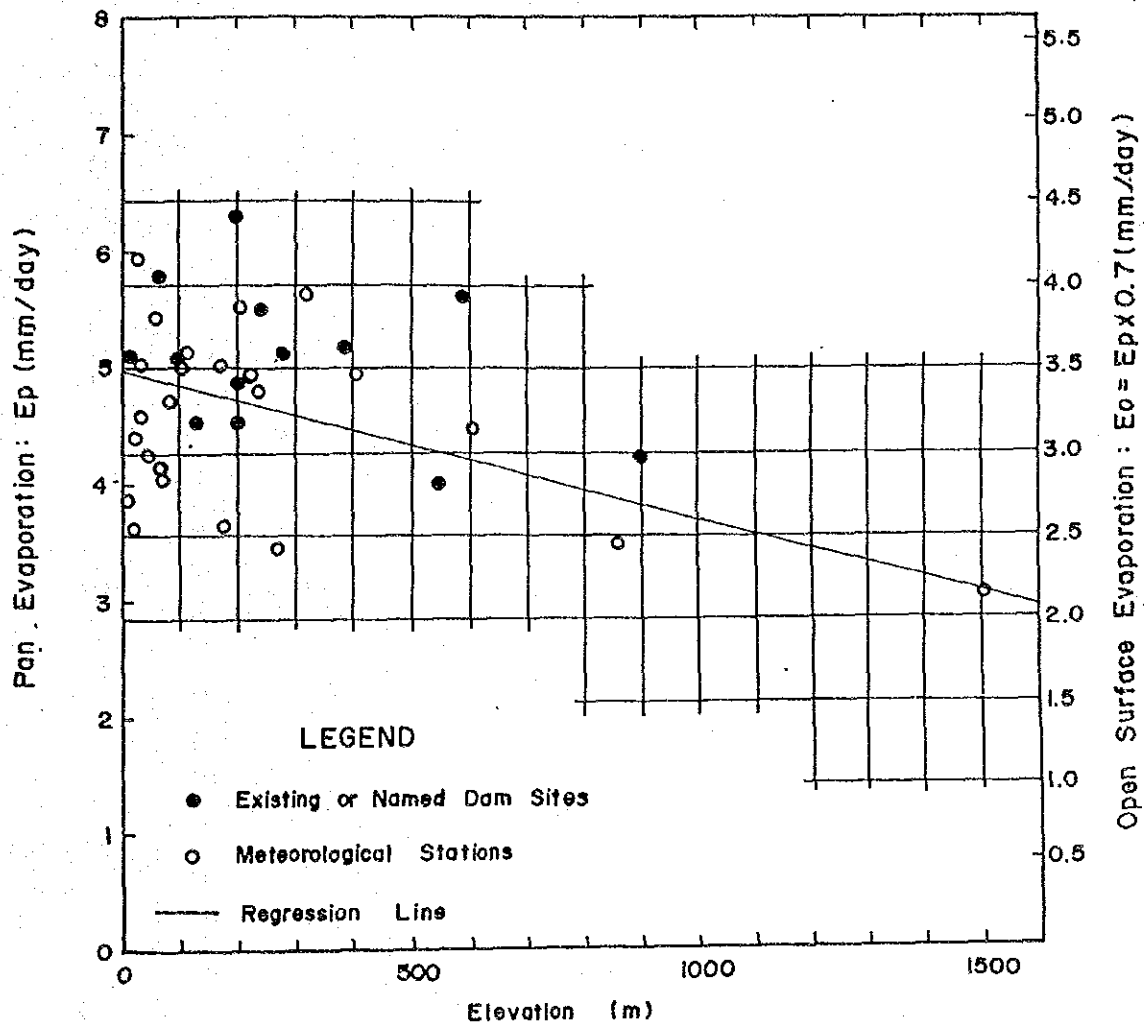


图 4.2 年間降雨等雨量线图

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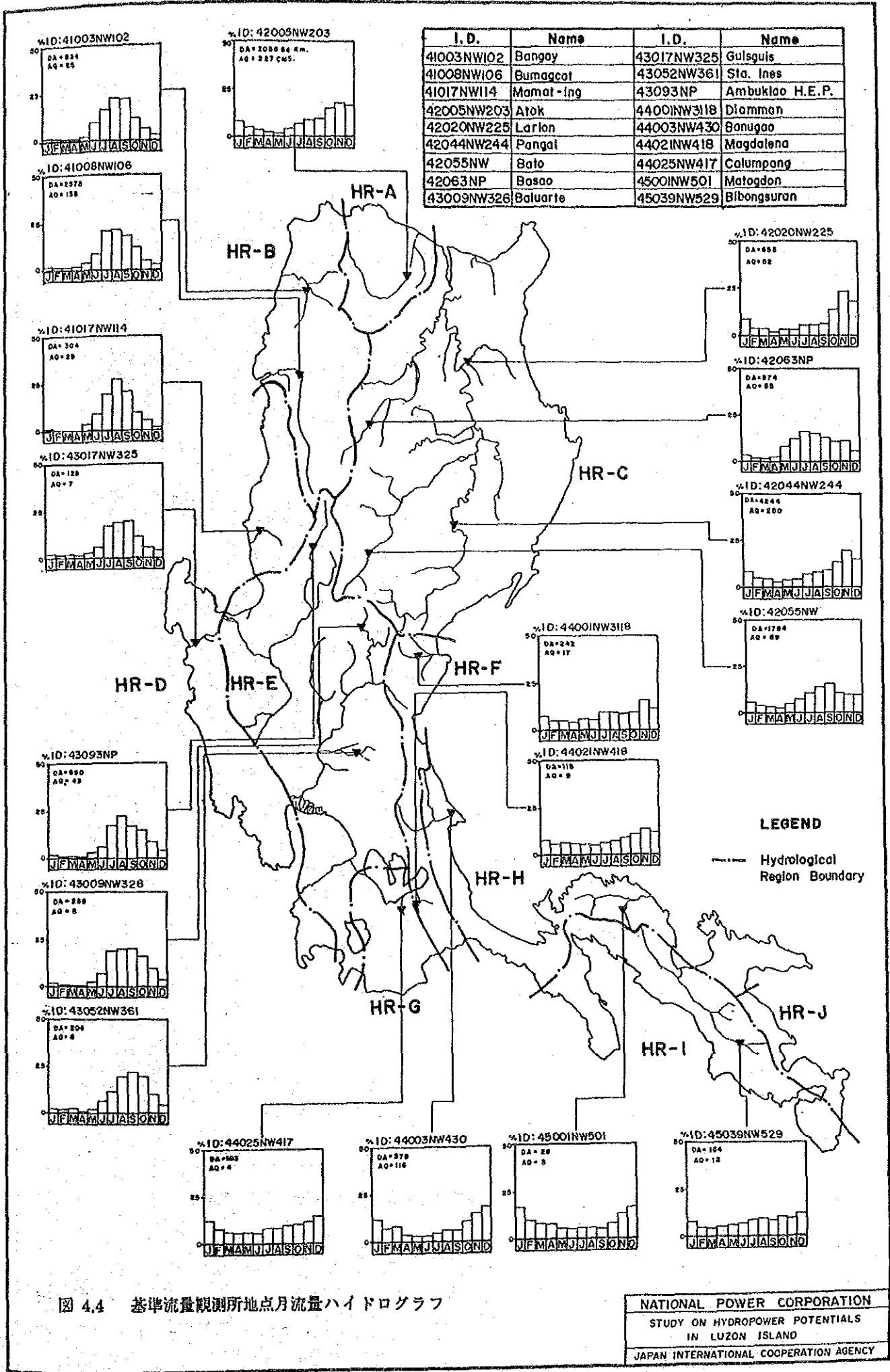


図 4.4 基準流量観測所地点月流量ハイドログラフ

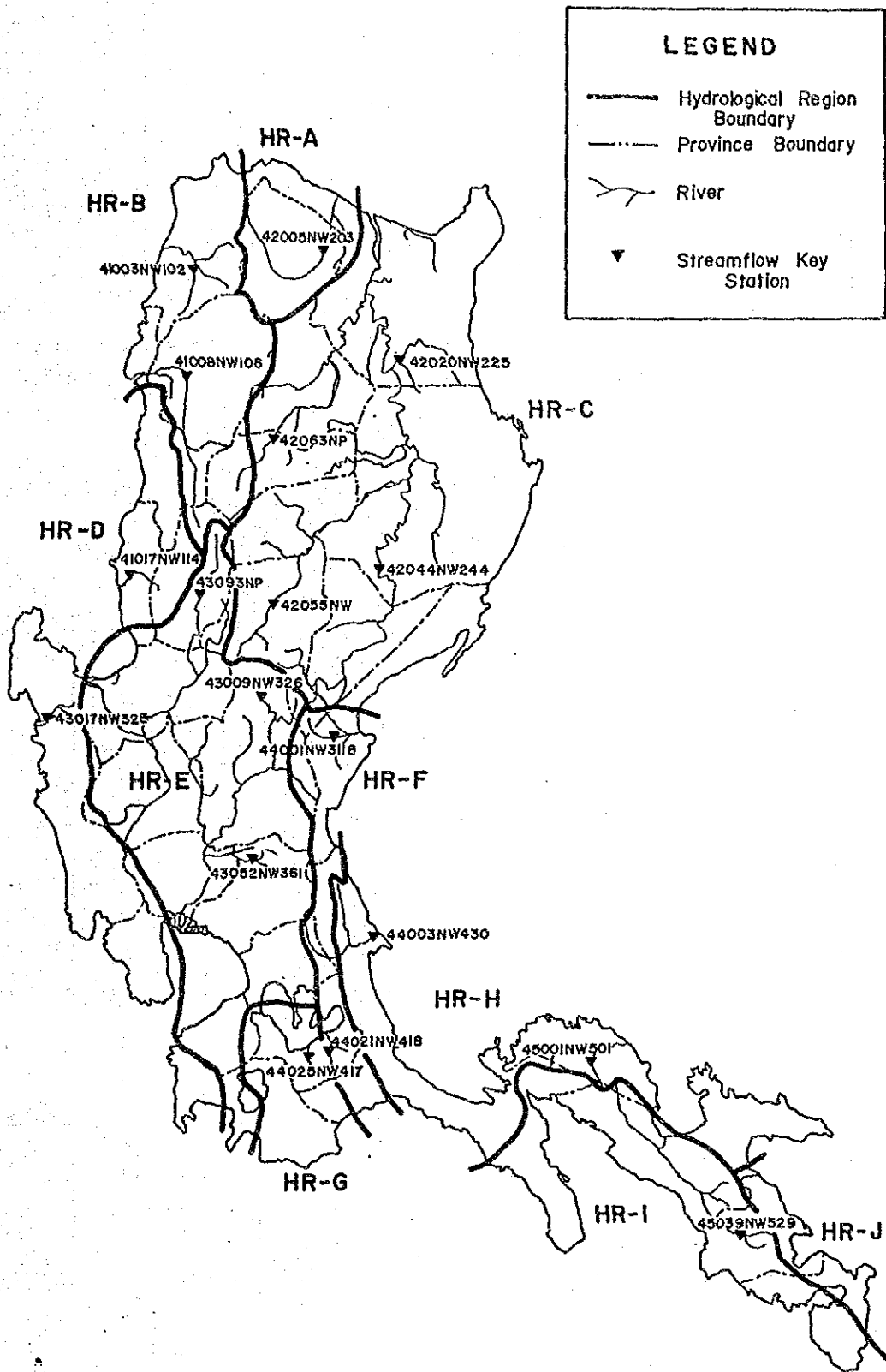
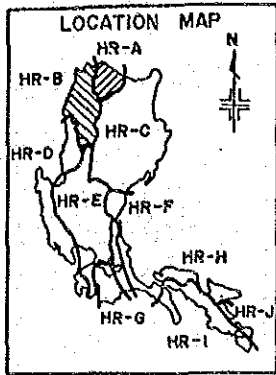


图 4.5 水文地域区分及び基準流量観測所



LEGEND

- Hydrological Region Boundary
- Rainfall Station
- ~ River

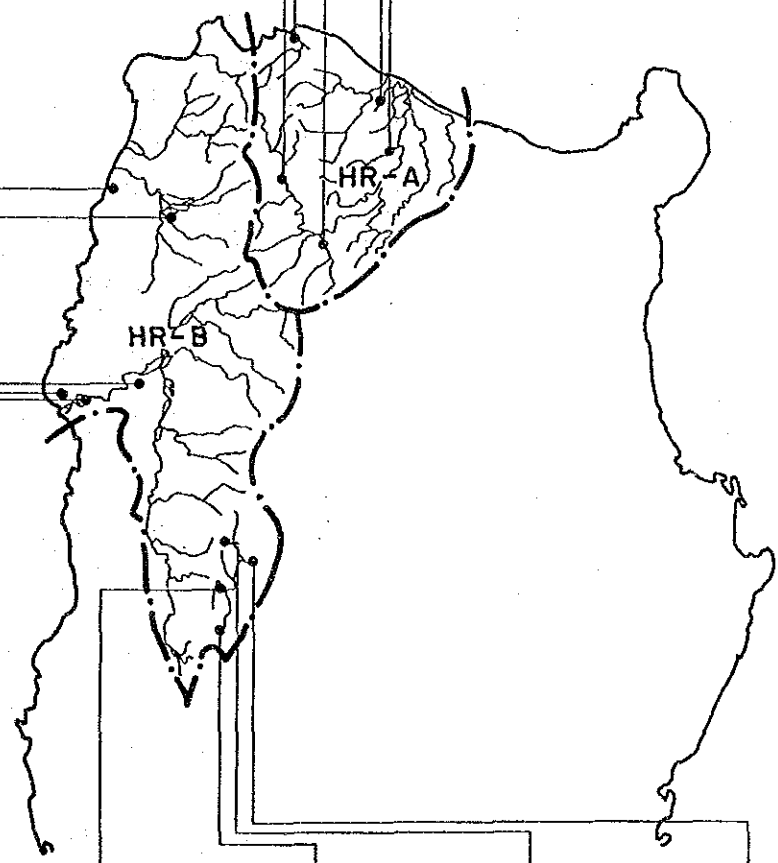
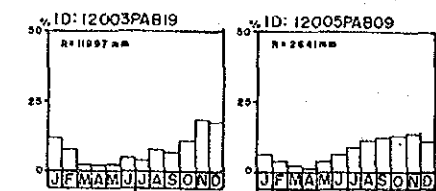
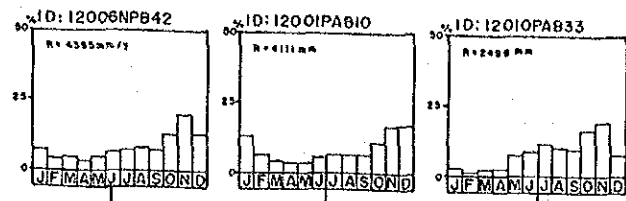
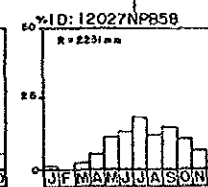
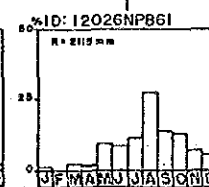
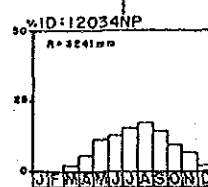
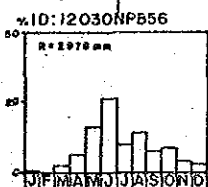
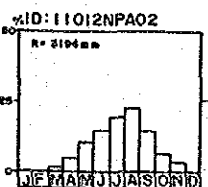
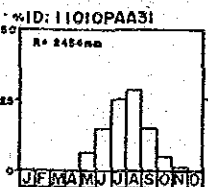
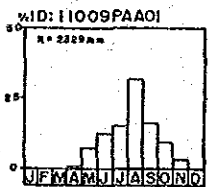
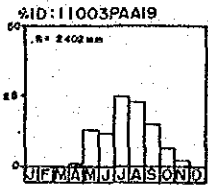
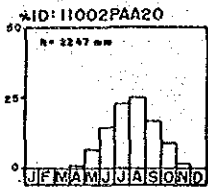


図 4.6 月雨量ハイエトグラフ(水文地域A,B)

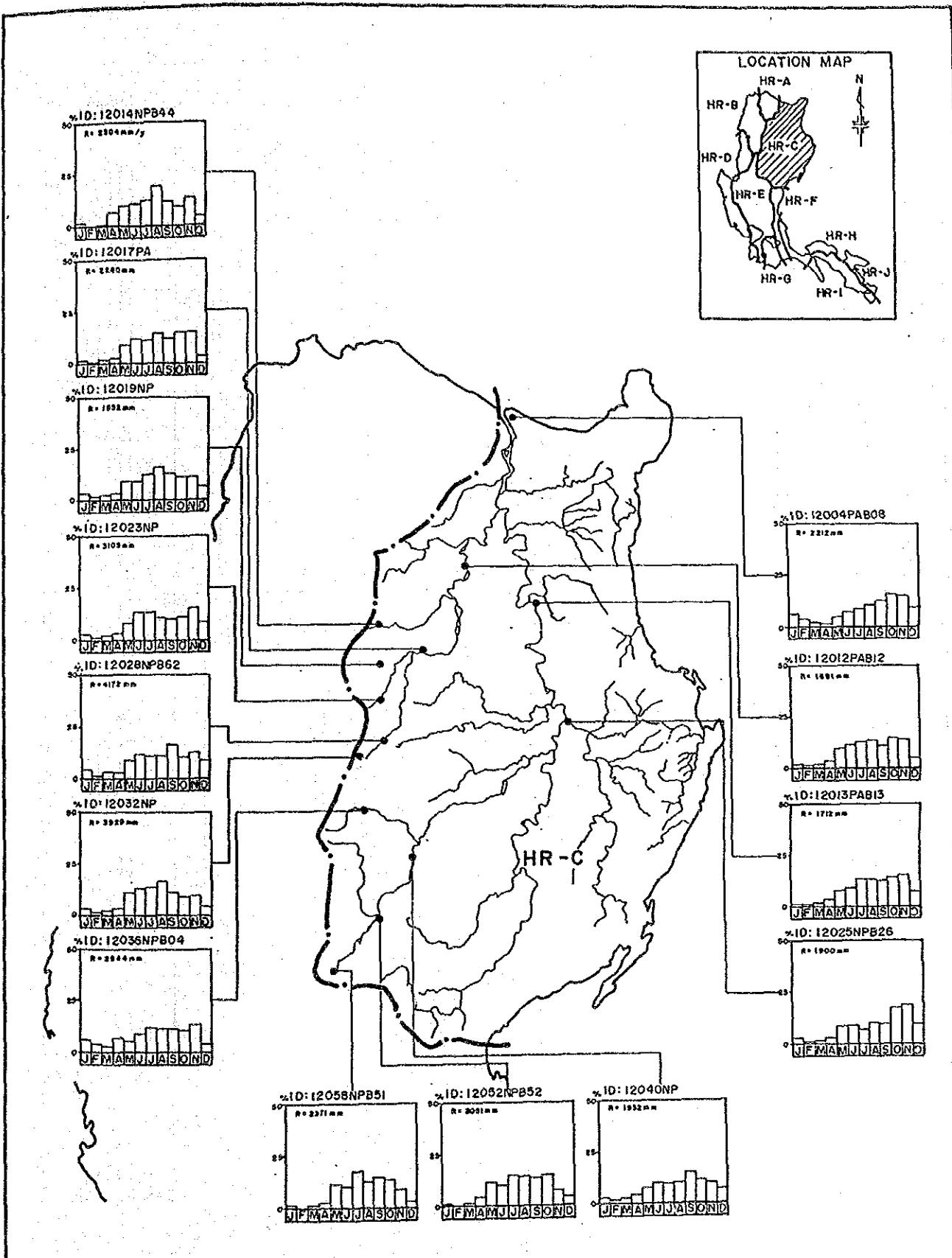


図 4.7 月雨量ハイトグラフ(水文地域 C)

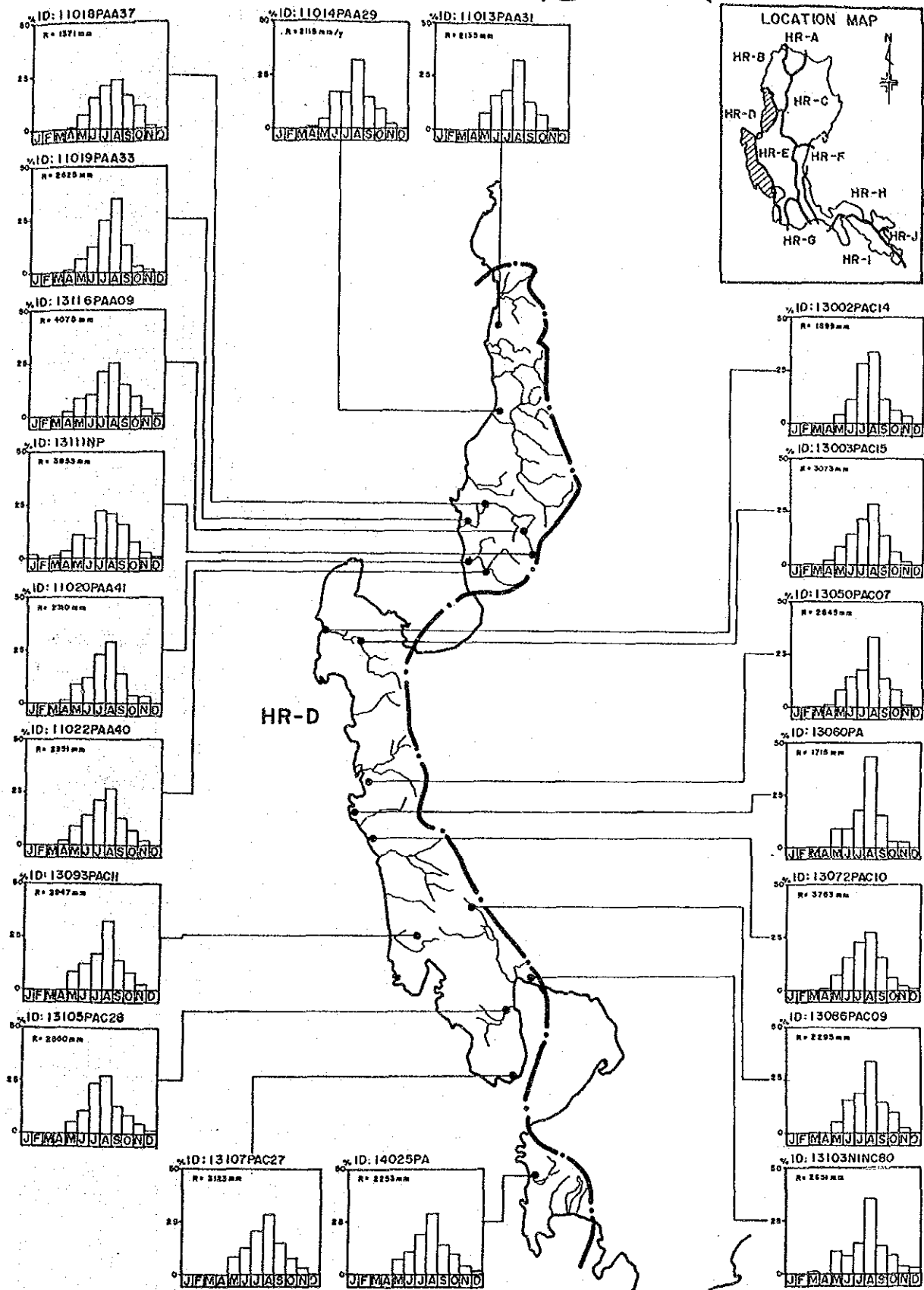


図 4.8 月雨量ハイエトグラフ(水文地域D)

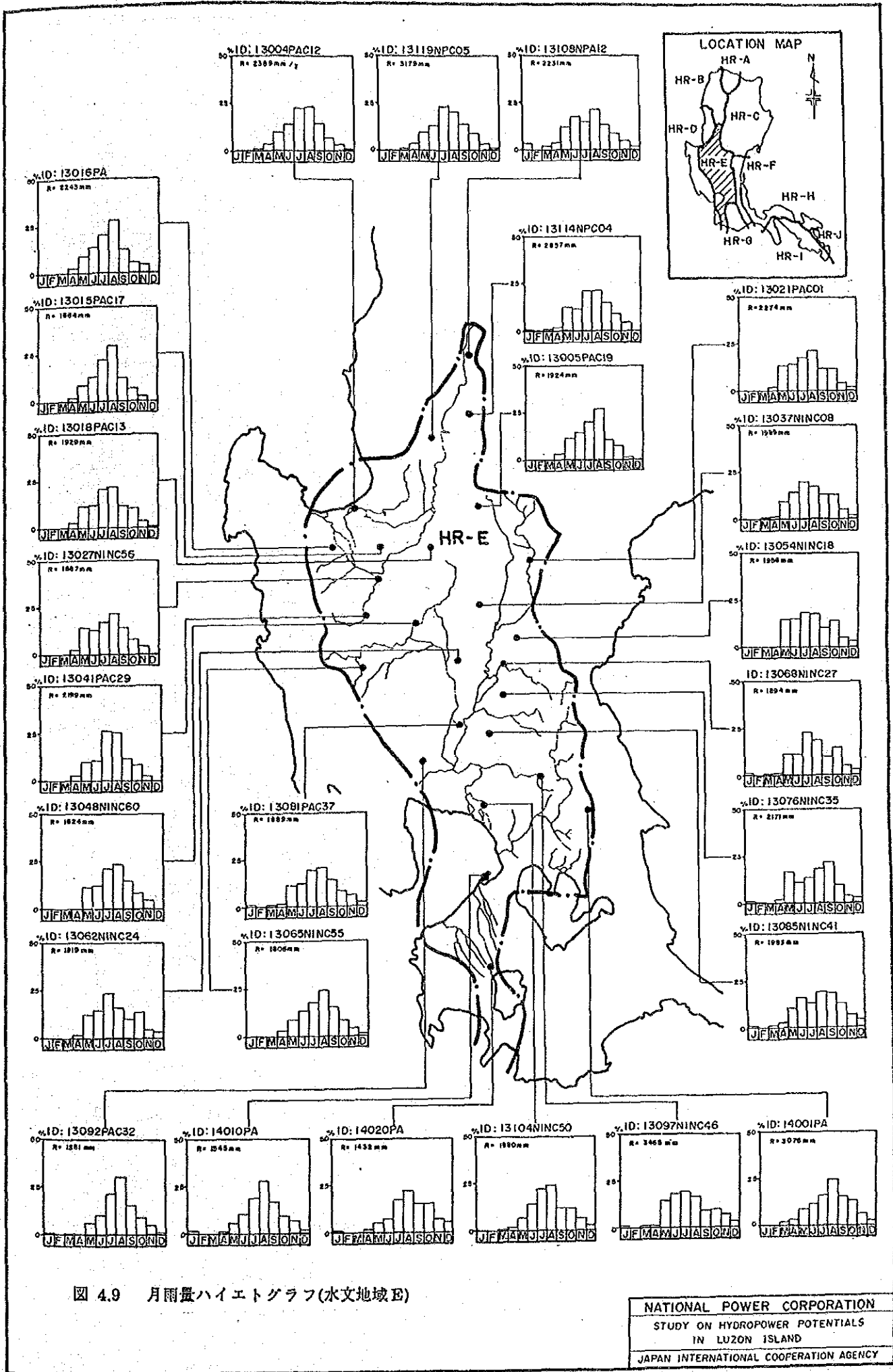


図 4.9 月雨量ハイエトグラフ(水文地域 E)

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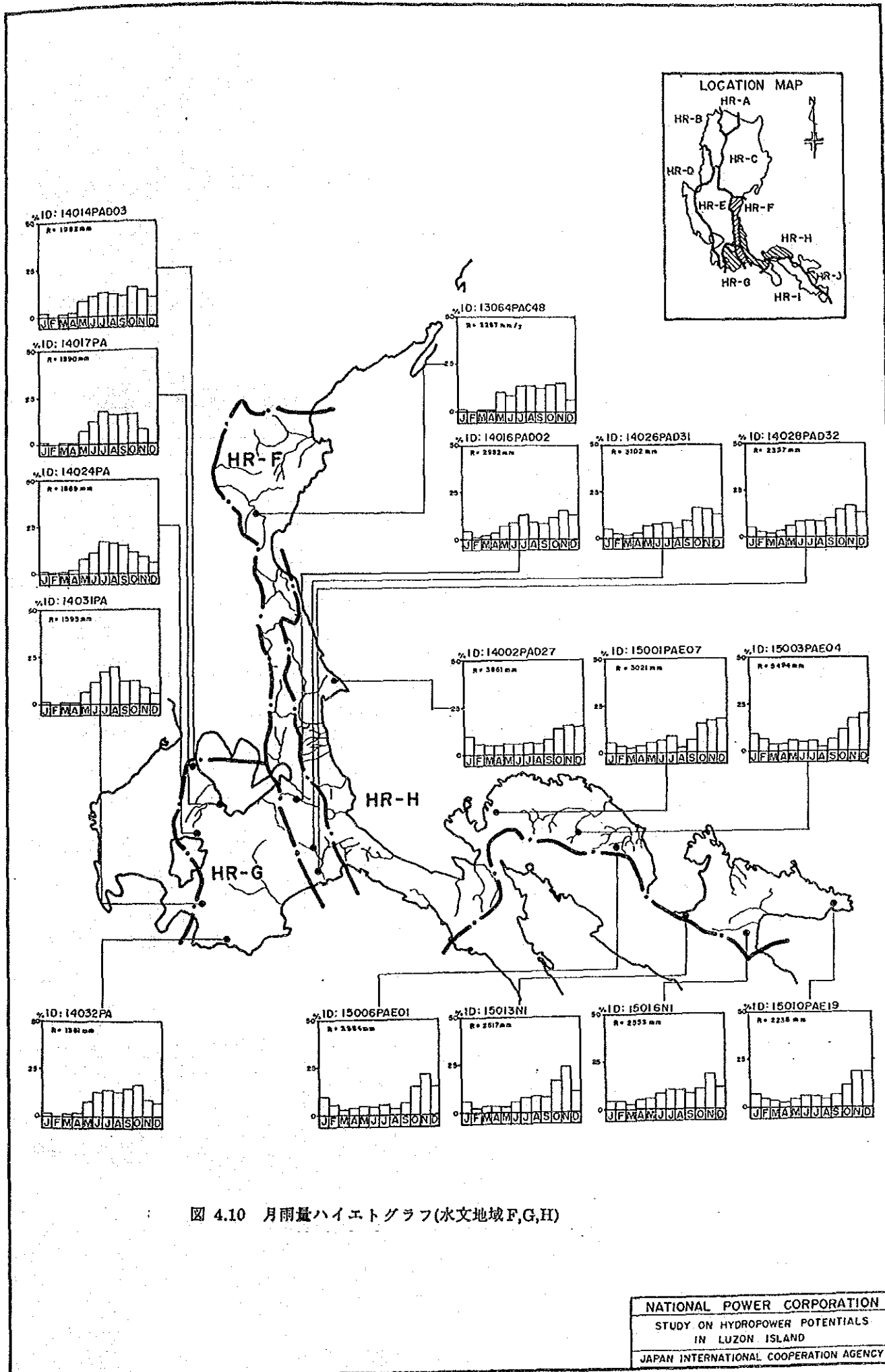


図 4.10 月雨量ハイトグラフ(水文地域F,G,H)

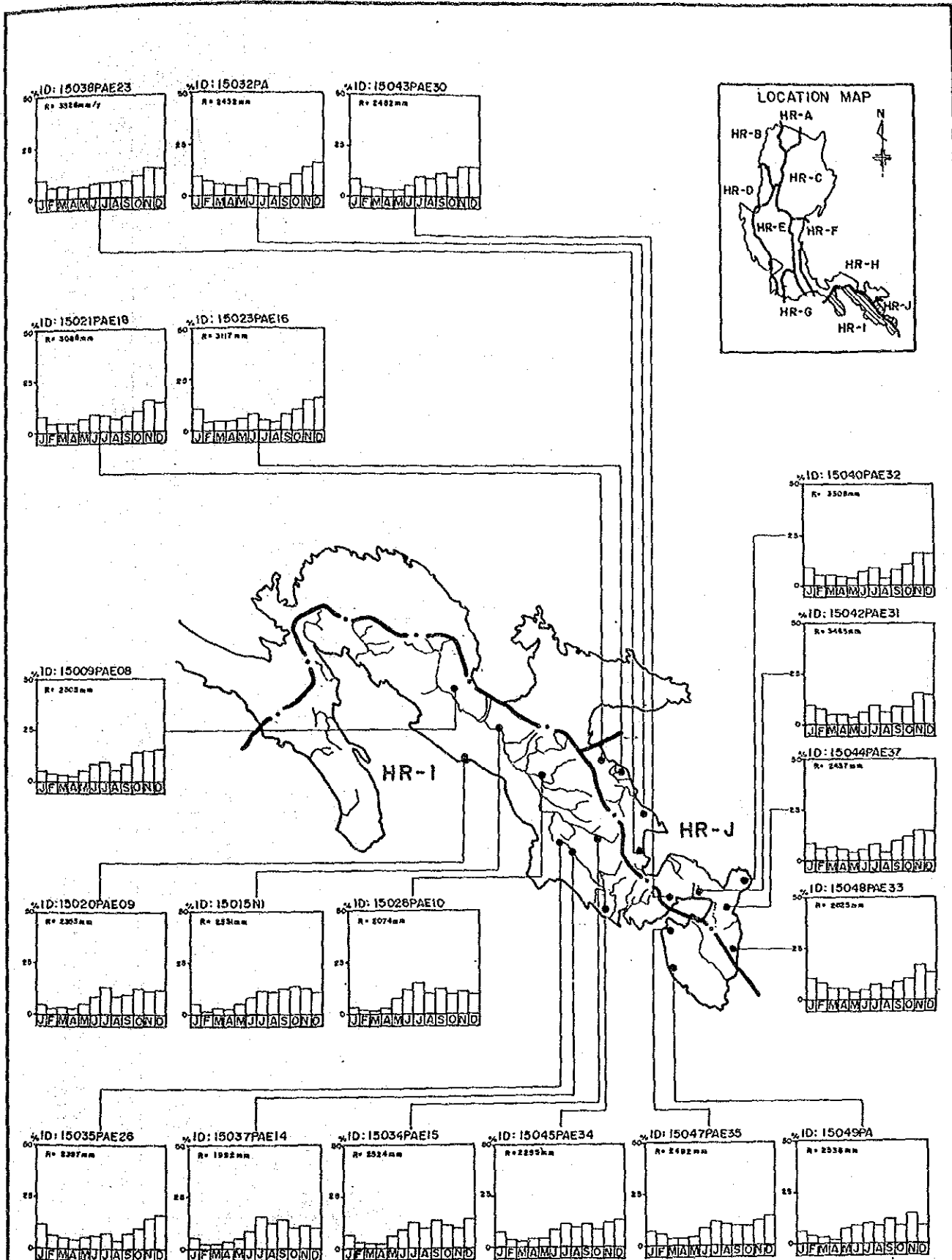
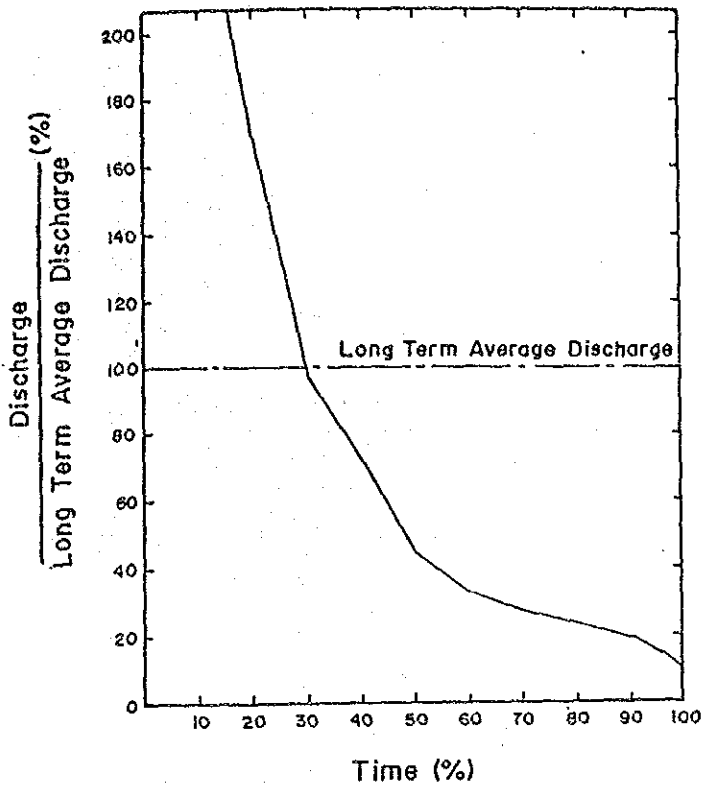


図 4.11 月雨量ハイトグラフ(水文地域I,J)

(1) Flow Duration Curve



Station : Bumagcat
 I.D. Code : 41008NW106
 River System : Abra
 Hydrological Region : B
 Drainage Area : 2,575 km²

(2) Storage Draft Curve

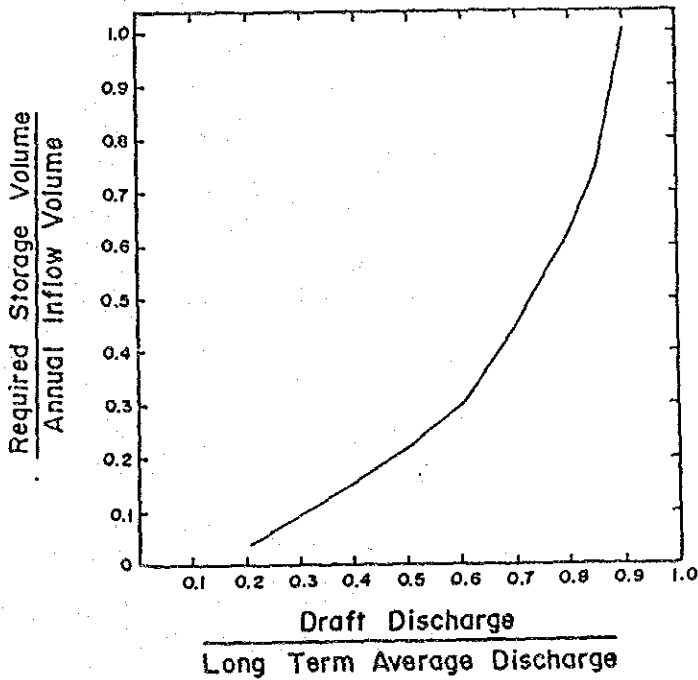


図 4.12 流況曲線並びに貯水池利用曲線

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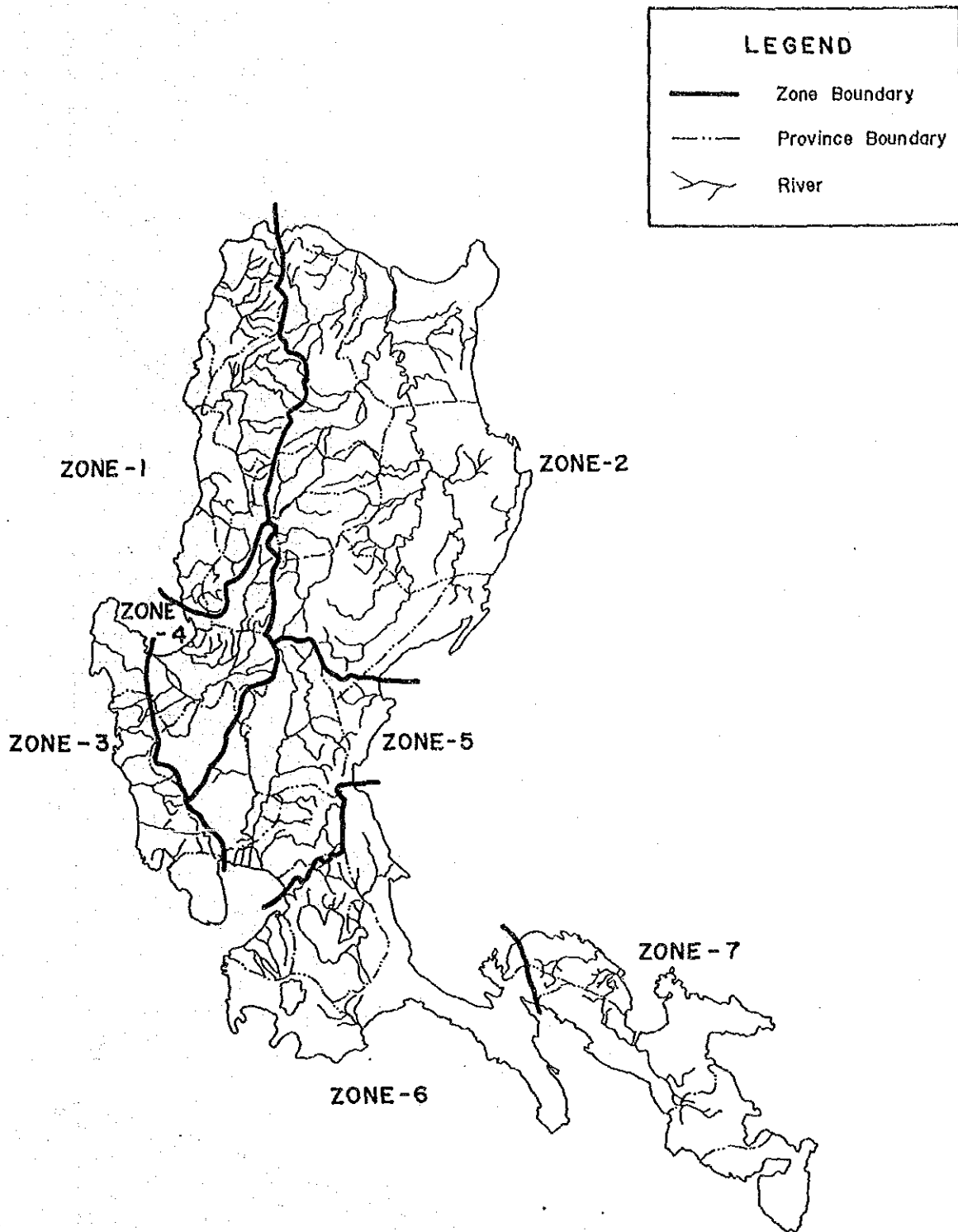
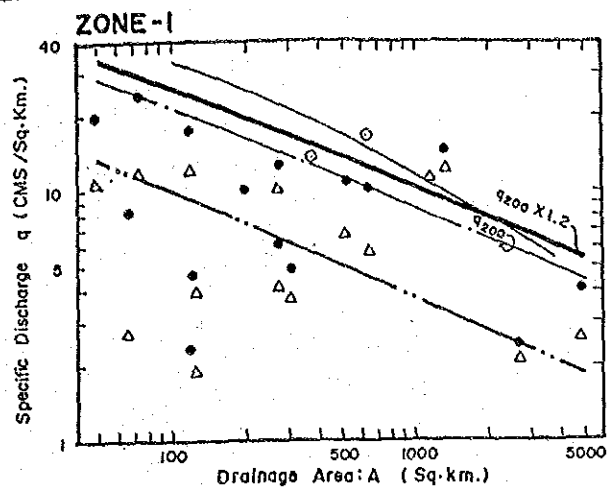


図 4.13 洪水解析に係る地域分割



LEGEND

- 200-Year Flood
- △ 25-Year Flood
- ⊙ Spillway Design Flood: Existing Fill Dam
- Spillway Design Flood: Named Fill Dam
- Design Flood Curve for Fill Dam Spillway
- - - Envelope Curve of 200-Year Floods
- Envelope Curve of Maximum Floods in Taiwan, Japan, Korea, the Philippines, and Viet-Nam (Source: Ref.)
- · - · Design Flood Curve for Fill Dam Diversion Works

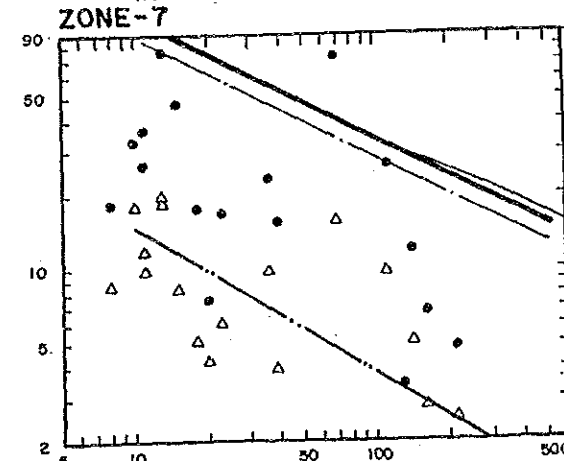
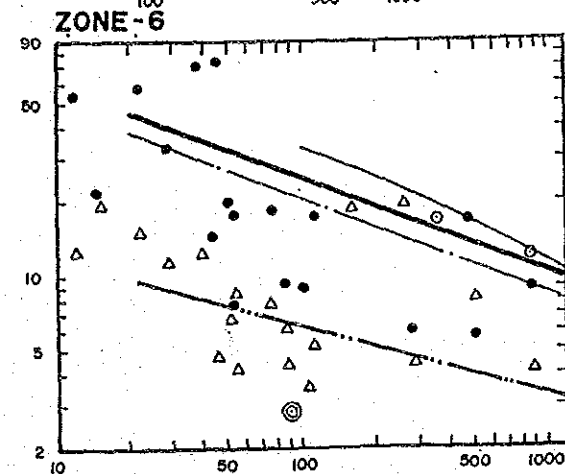
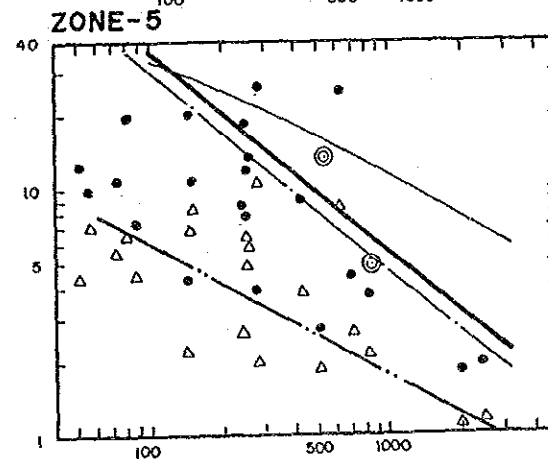
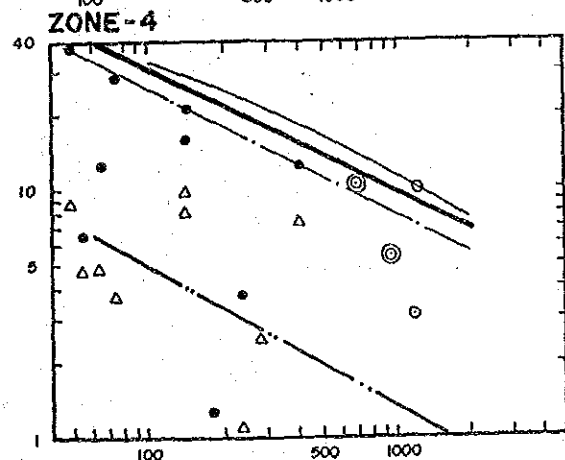
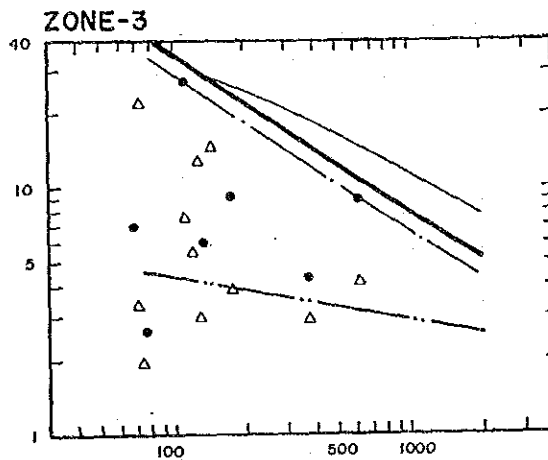
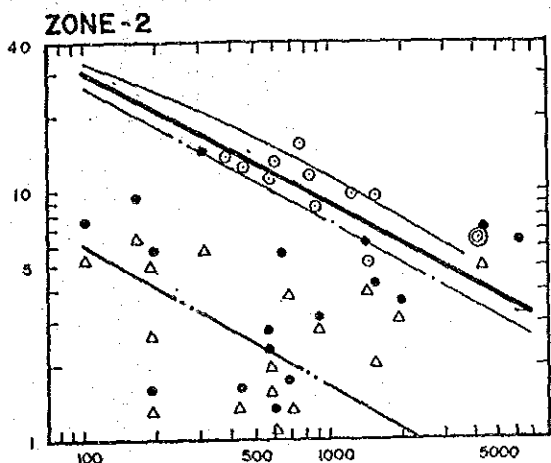


図 4.14 洪水吐並びに転流工設計洪水流量曲線

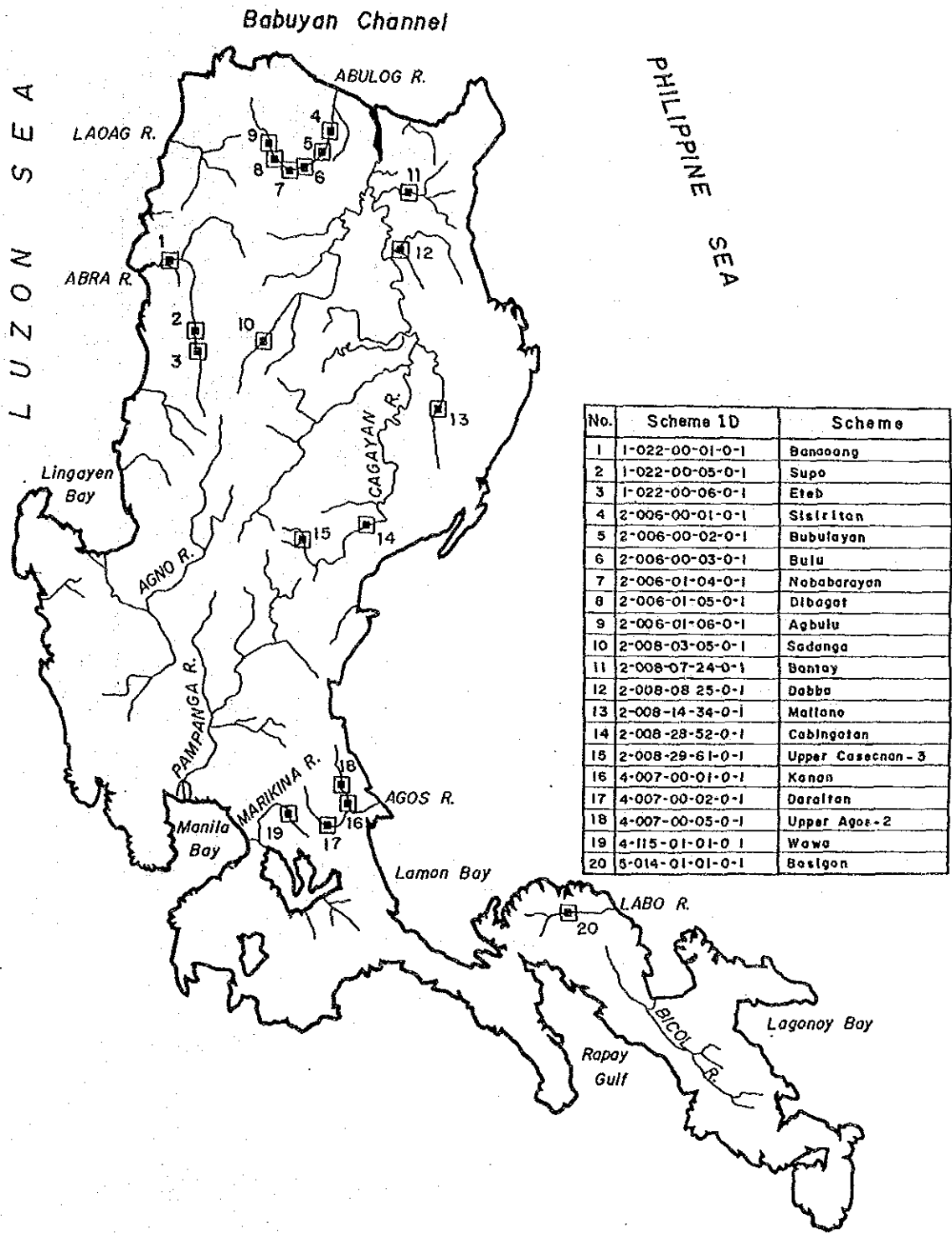
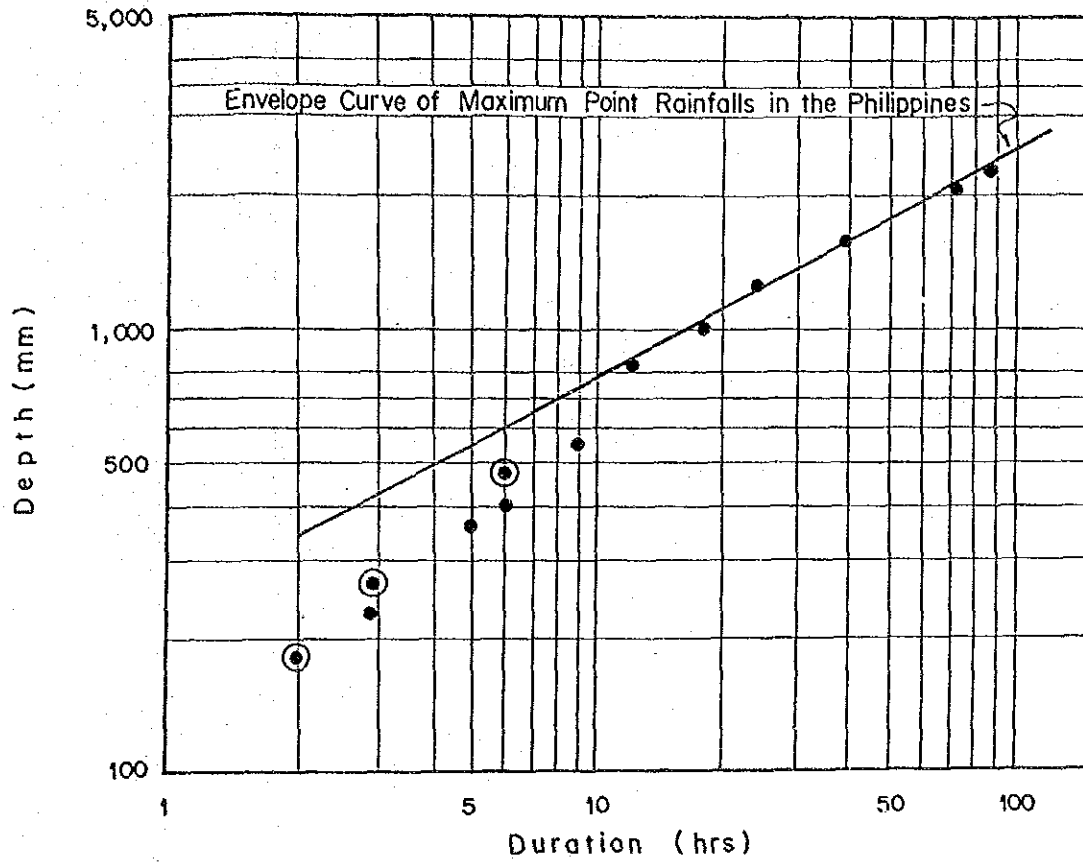


図 4.15 第一次スクリーニングを通過した貯水池式水力地点-位置図



Note: ● Observed maximum point rainfall in the Philippines
 (All rainfalls were observed in Baguio City)
 Source: Spillway design flood for potential dam
 & reservoir sites in Central Luzon Basin,
 BPW, July, 1964

⊙ Based on the data collected in this study.

図 4.16 最大雨量-継続時間曲線(フィリピン)

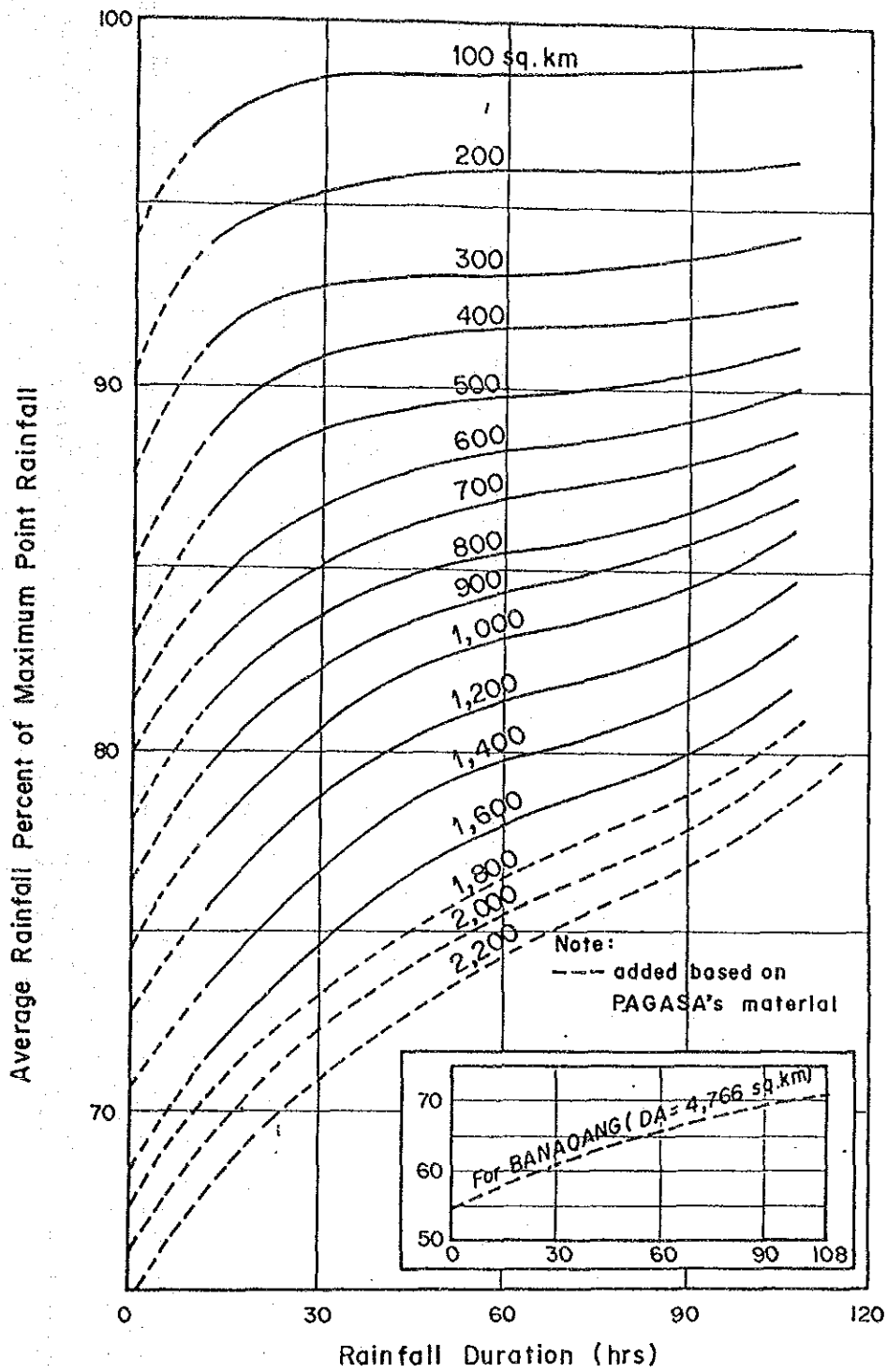


圖 4.17 D-A-D 曲線

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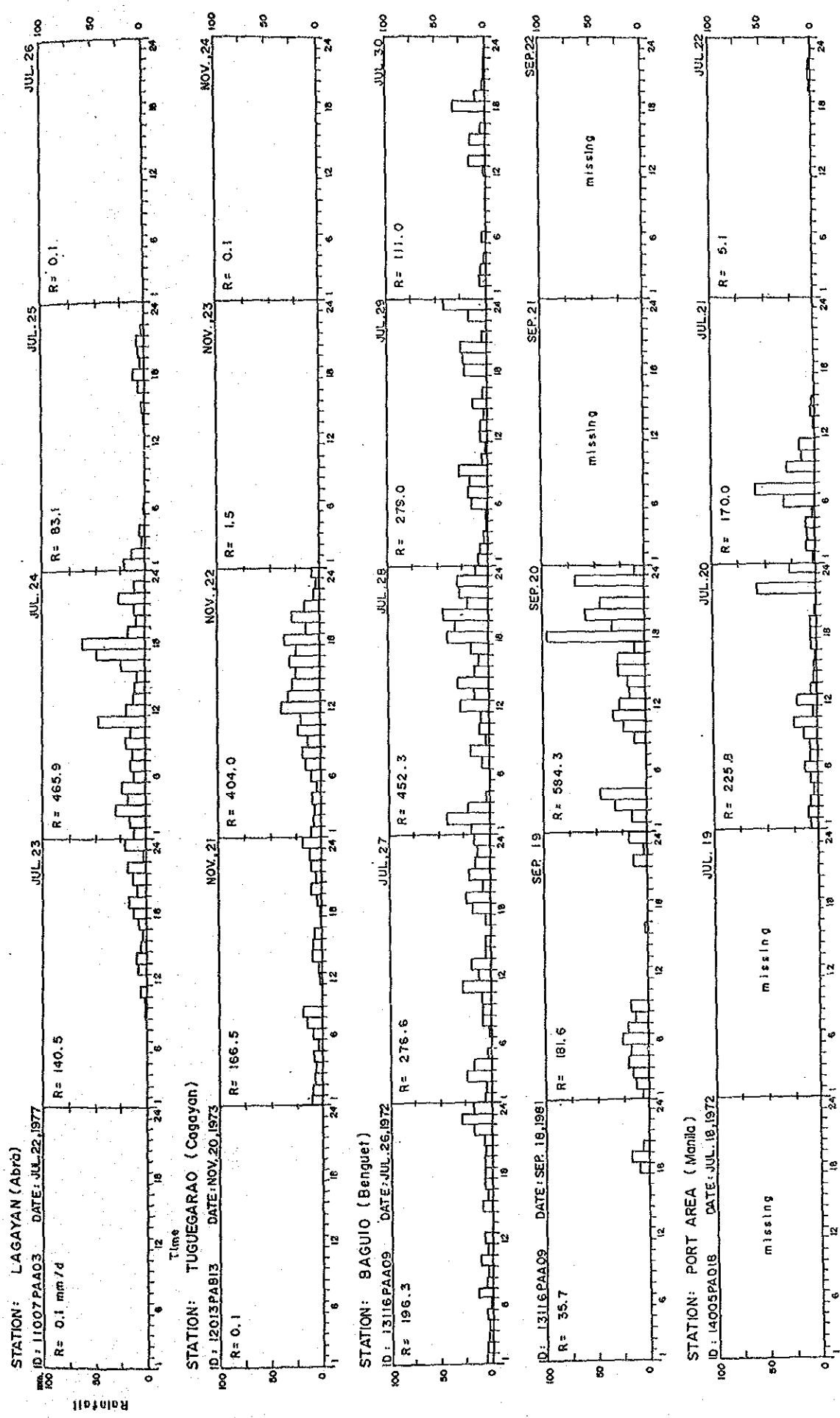


図 4.18 ルソン島内豪雨時間分布図

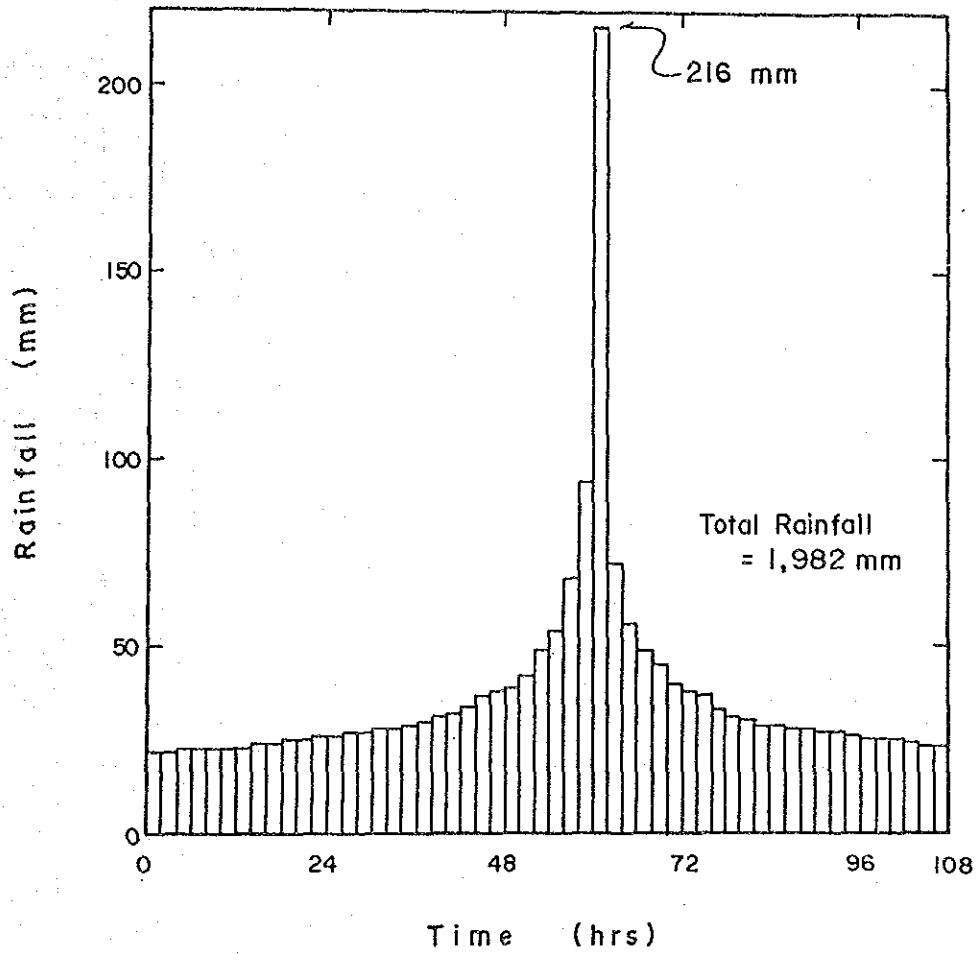
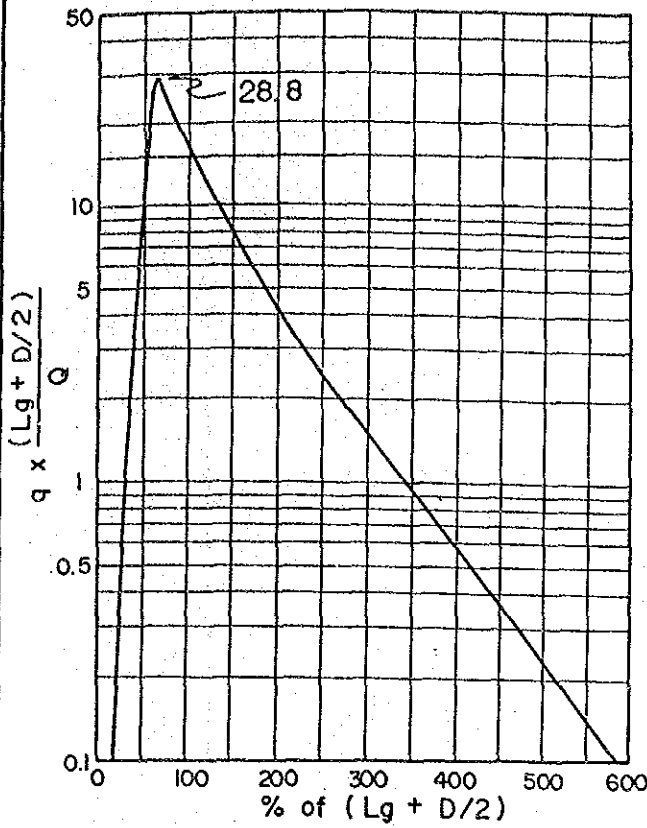
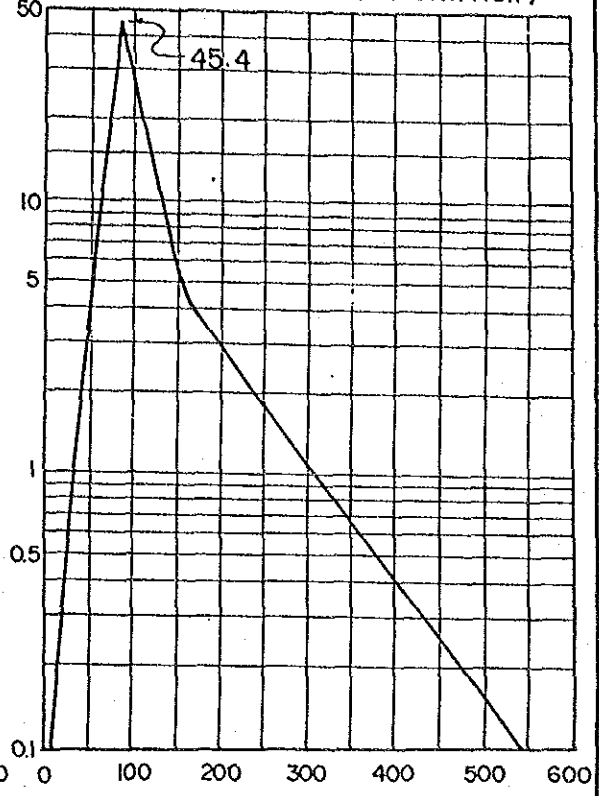


図 4.19 洪水吐設計降雨(シシリタン流域)

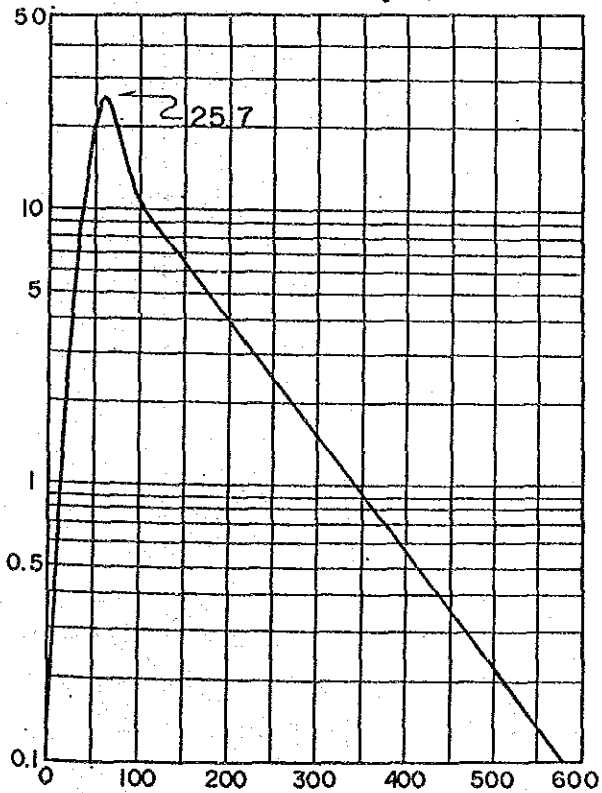
ABRA Basin (at Tapayen)



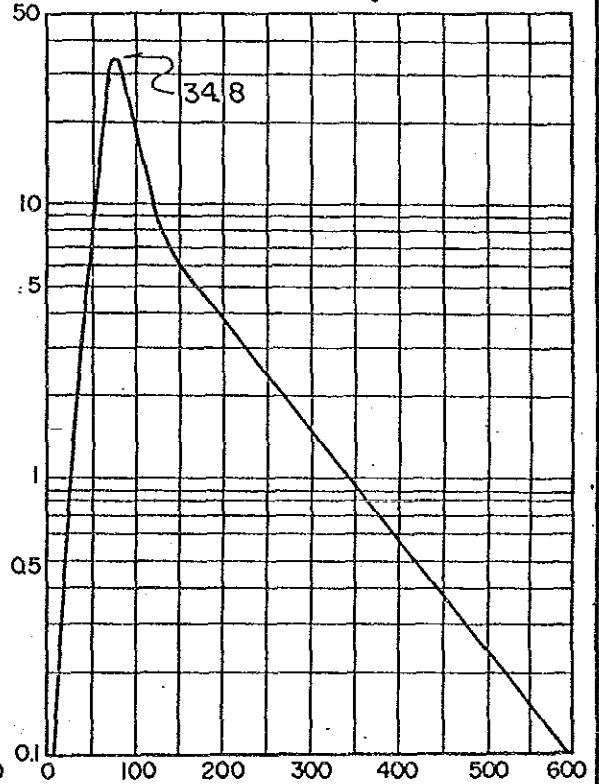
APAYAO-ABULOG Basin (at Sisiritan)



CAGAYAN Basin (at Magat)



AGOS Basin (at Banugao)



q = discharge of direct runoff (m^3/s)
 Lg = basin lag (h)

D = duration of rainfall excess (h)
 Q = direct runoff volume (m^3/s - days)

図 4.20 水系別無次元ハイドログラフ

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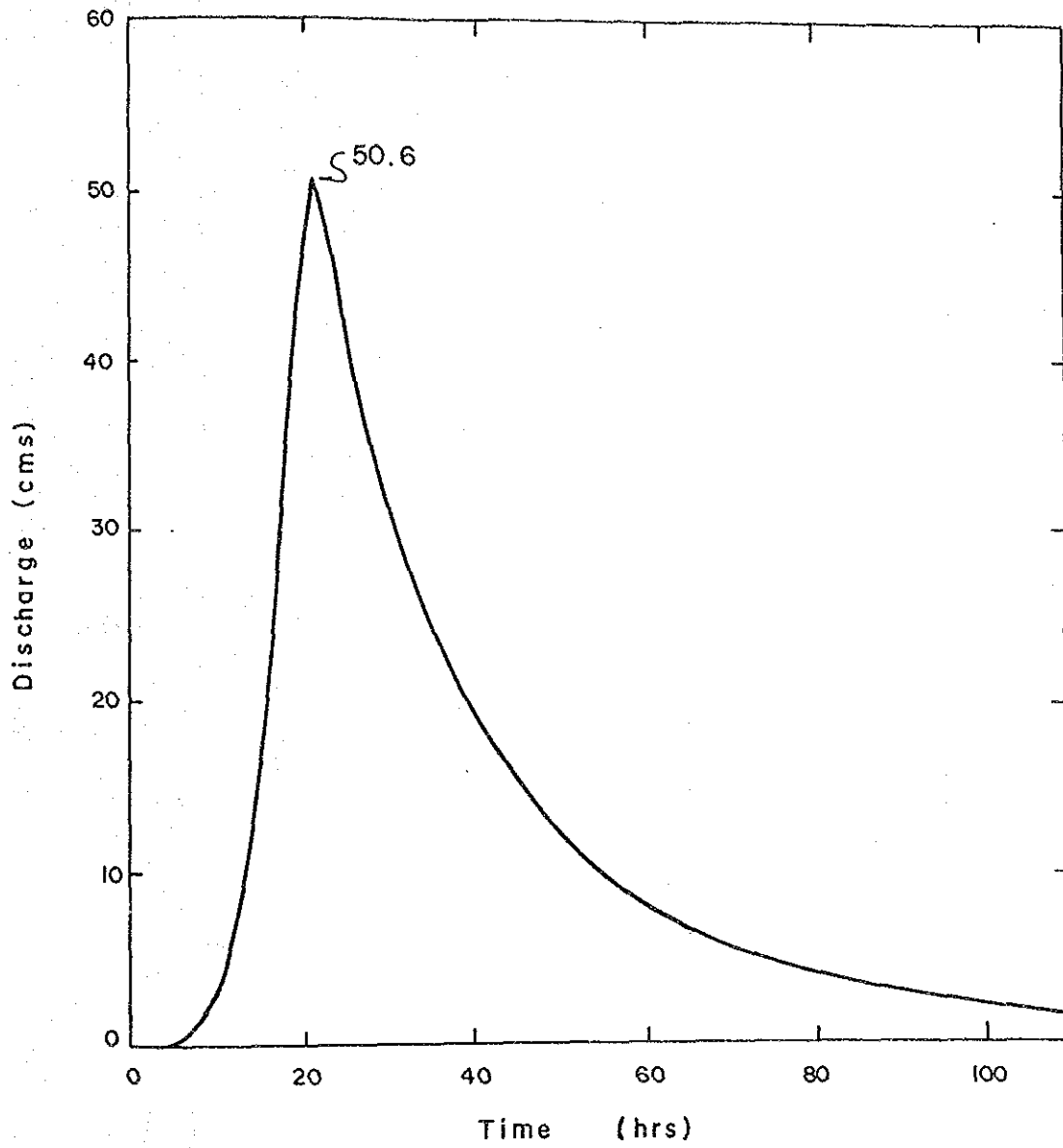
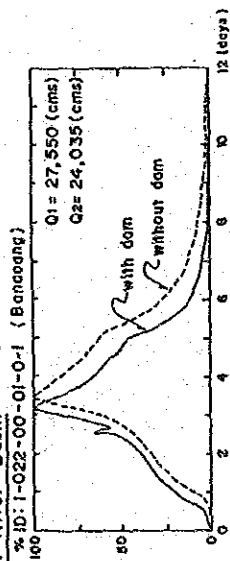


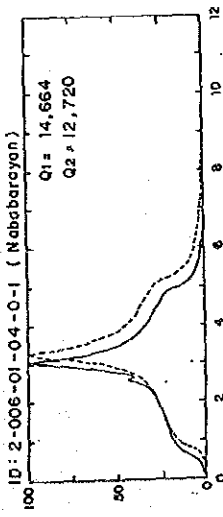
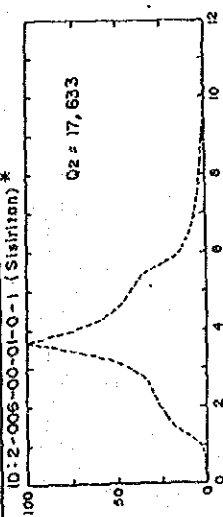
図 4.21 2時間-1mm単位図(バナオアン地点)

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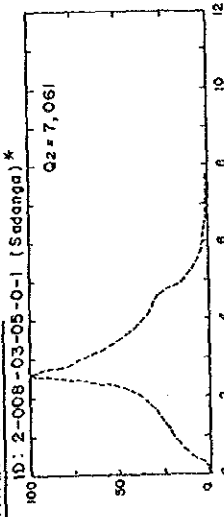
ABRA River Basin



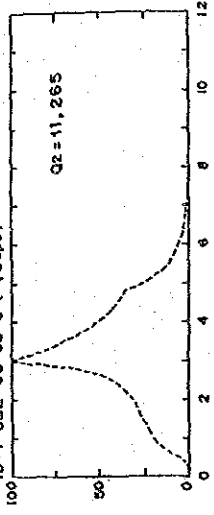
APAYAO-ABULOG River Basin



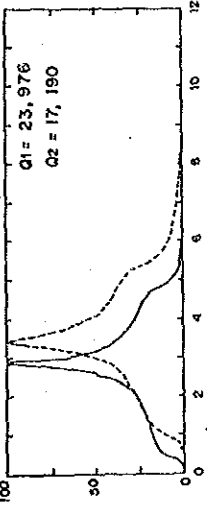
CAGAYAN River Basin



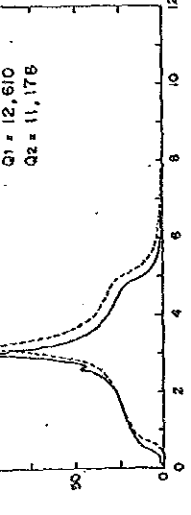
ID: 1-022-00-05-0-1 (Supo)*



ID: 2-006-00-02-0-1 (Bubulayan)



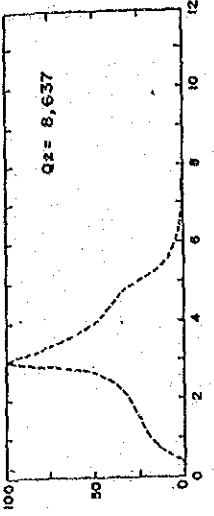
ID: 2-006-01-05-0-1 (Dibagat)



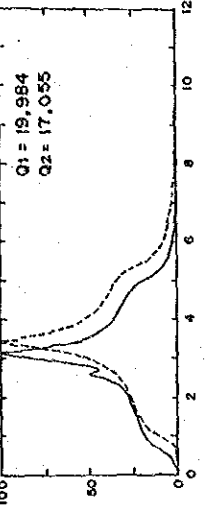
ID: 2-008-07-24-0-1 (Bantay)



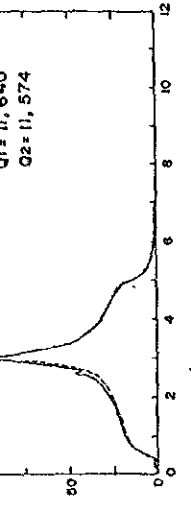
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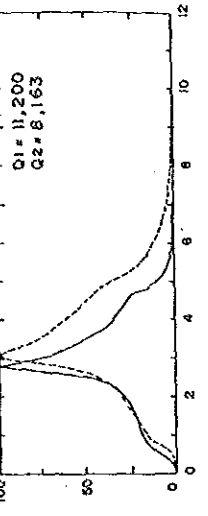
ID: 2-006-00-03-0-1 (Bulu)



ID: 2-006-01-06-0-1 (Agbulu)



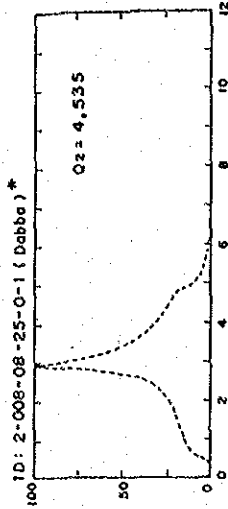
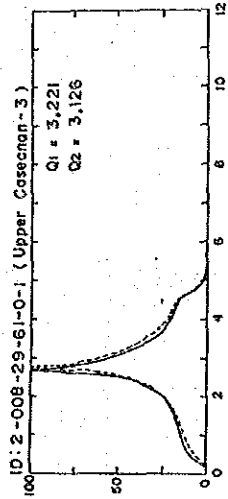
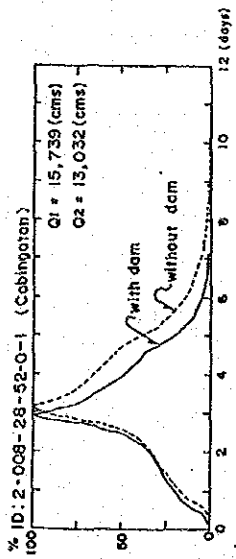
ID: 2-008-14-34-0-1 (Mollano)



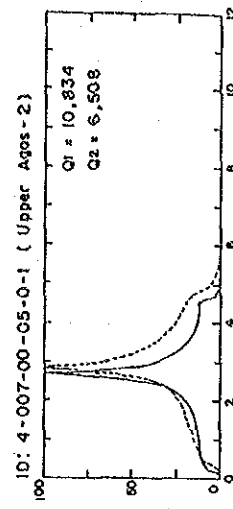
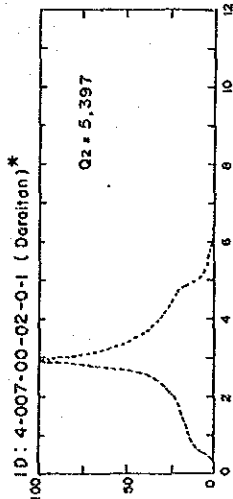
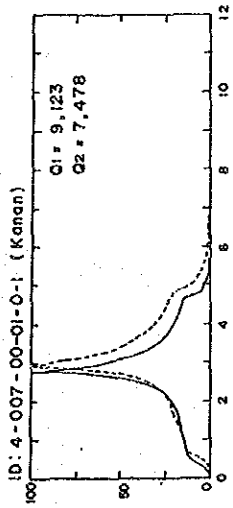
Note: Q1 = Flood peak in with dam case
 Q2 = Flood peak in without dam case
 As for scheme with (*), it is presumed that the hydrograph is common for without cases.

図 4.22 洪水吐設計のための洪水ハイドログラフ (1/2)

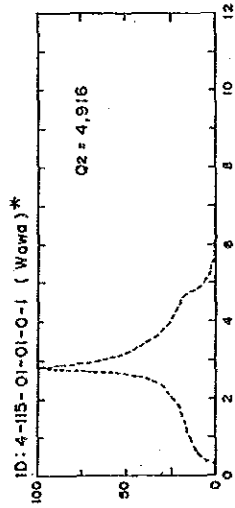
CAGAYAN River Basin



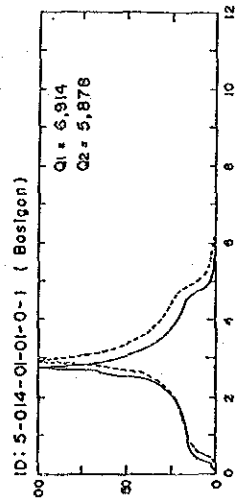
AGOS River Basin



MARIKINA River Basin



LABO River Basin



Note : Q1 = Flood peak in with dam case

Q2 = Flood peak in without dam case

As for scheme with (*), it is presumed that the hydrograph is common for with and without cases.

図 4.22 洪水吐設計のための洪水ハイドログラフ (2/2)

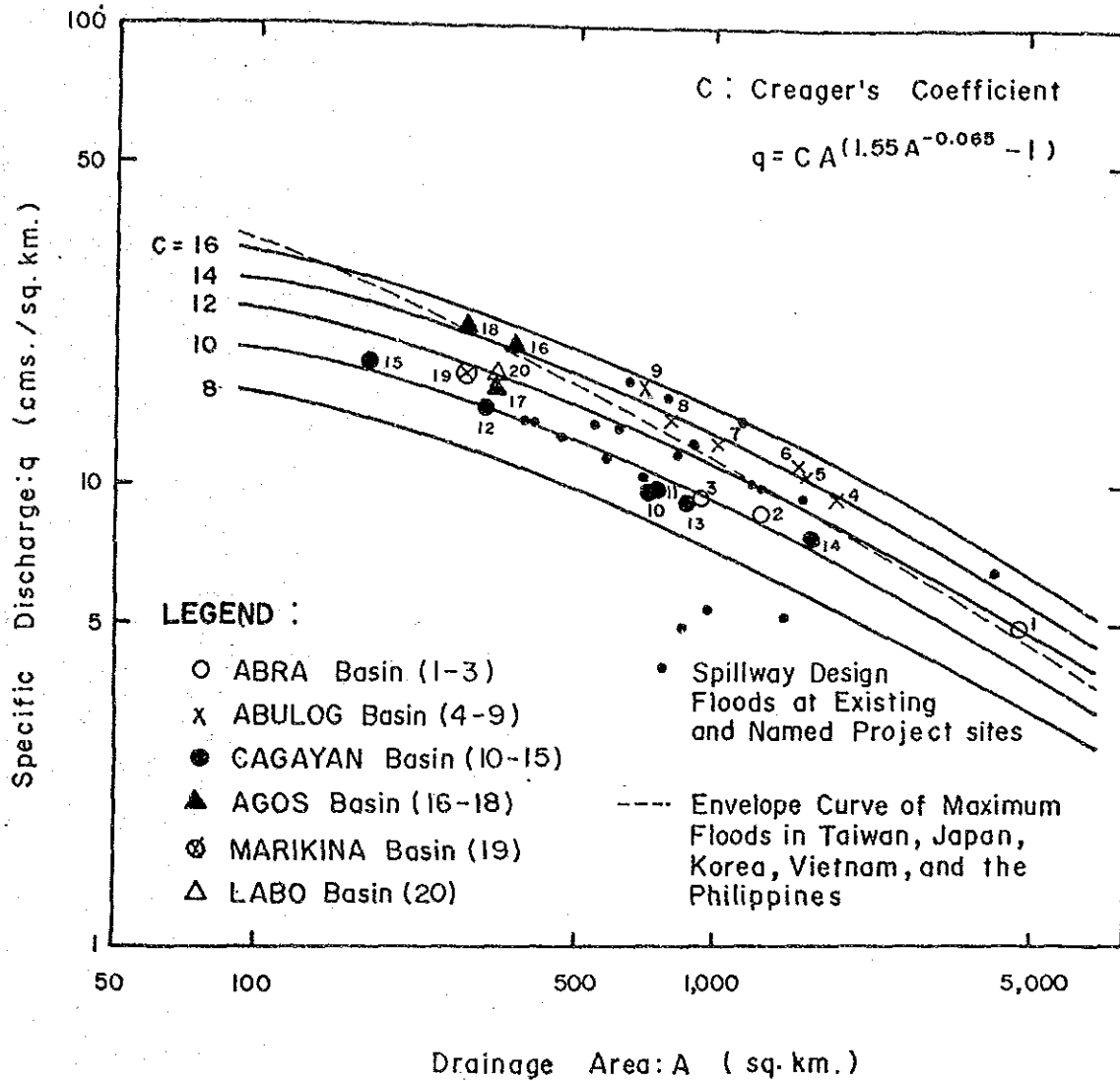
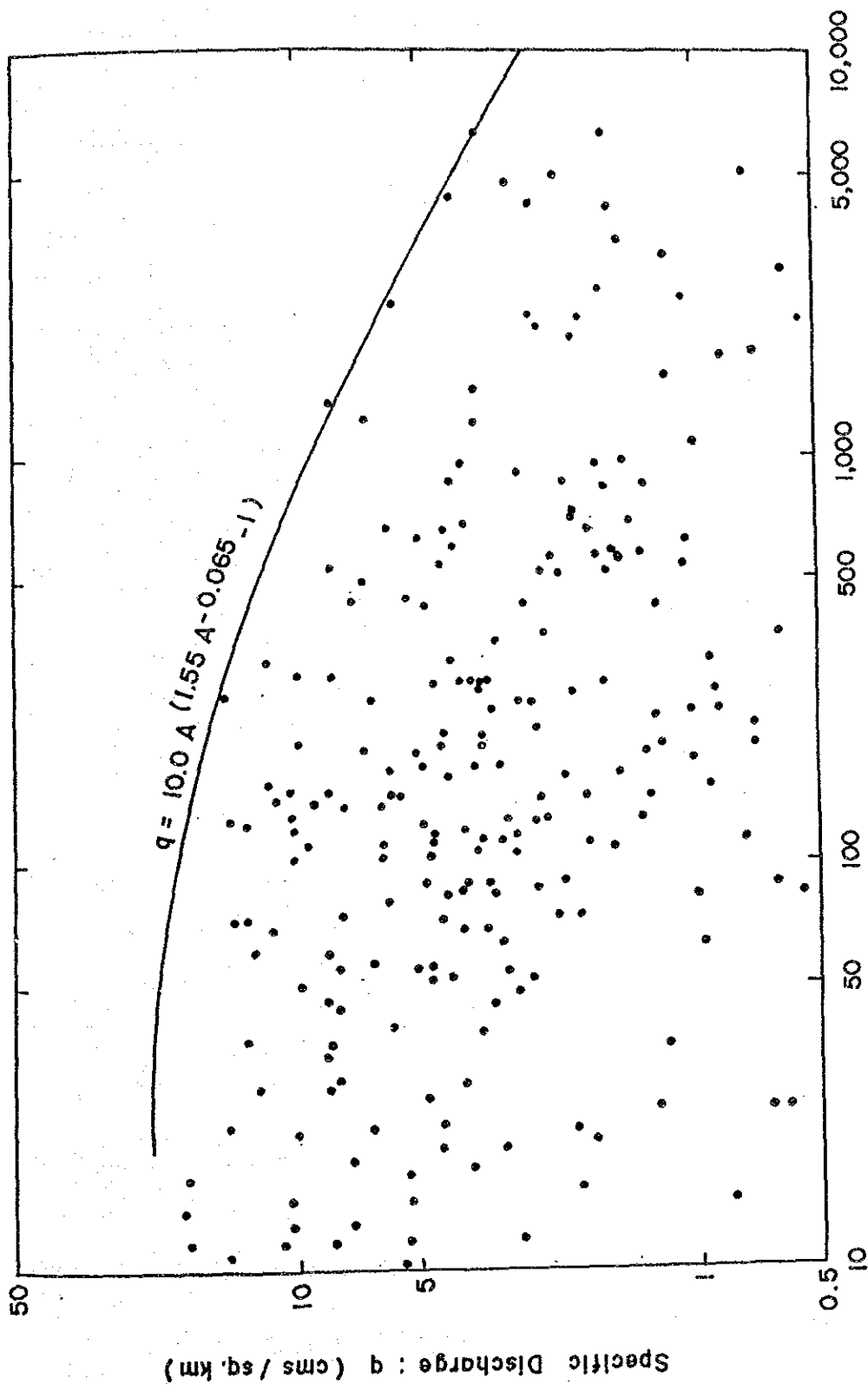


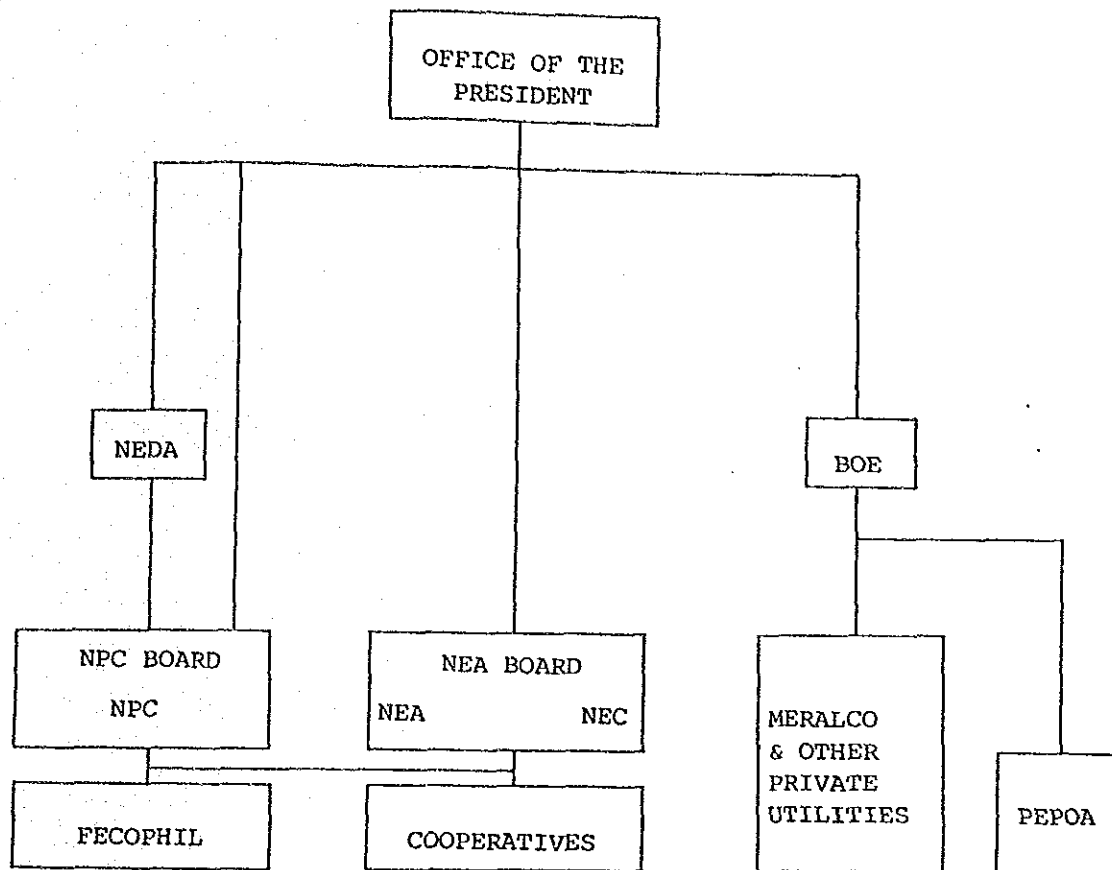
図 4.23 貯水池式水力地点のPMF



Drainage Area : A (sq. km)

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図 4.24 フィリピン内既往最大洪水包絡線



Notes:

- BOE : Board of Energy
- NEDA : National Economic and Development Authority
- NEC : National Electrification Commission
- NEA : National Electrification Administration
- NPC : National Power Corporation
- FECOPHIL : The Federation of Electric Cooperatives of the Philippines
- PEPOA : Philippine Electric Plant Owners Association

Source: NPC, NEA, and MERALCO

図 6.1 フィリピン電力事業機構図

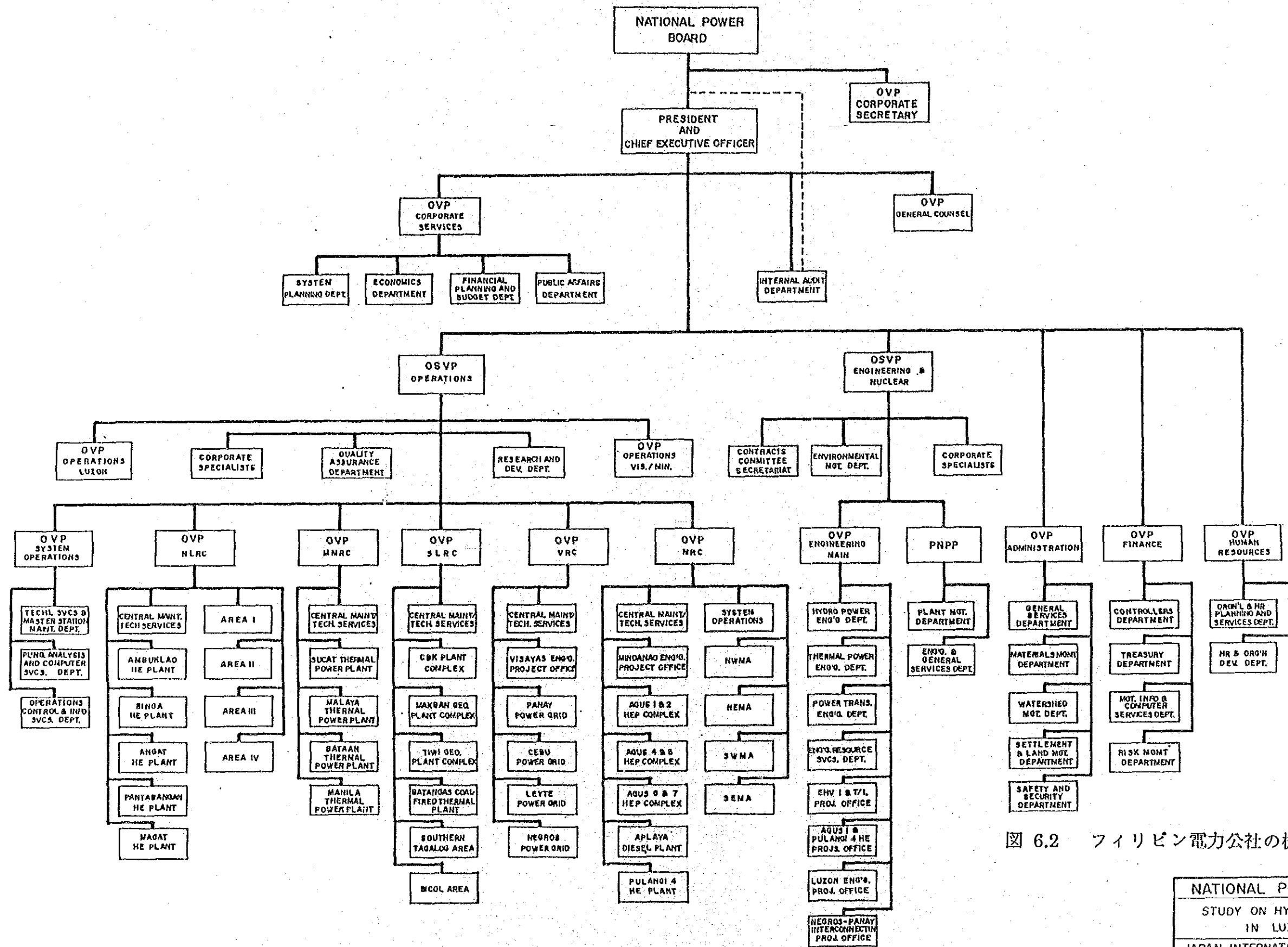
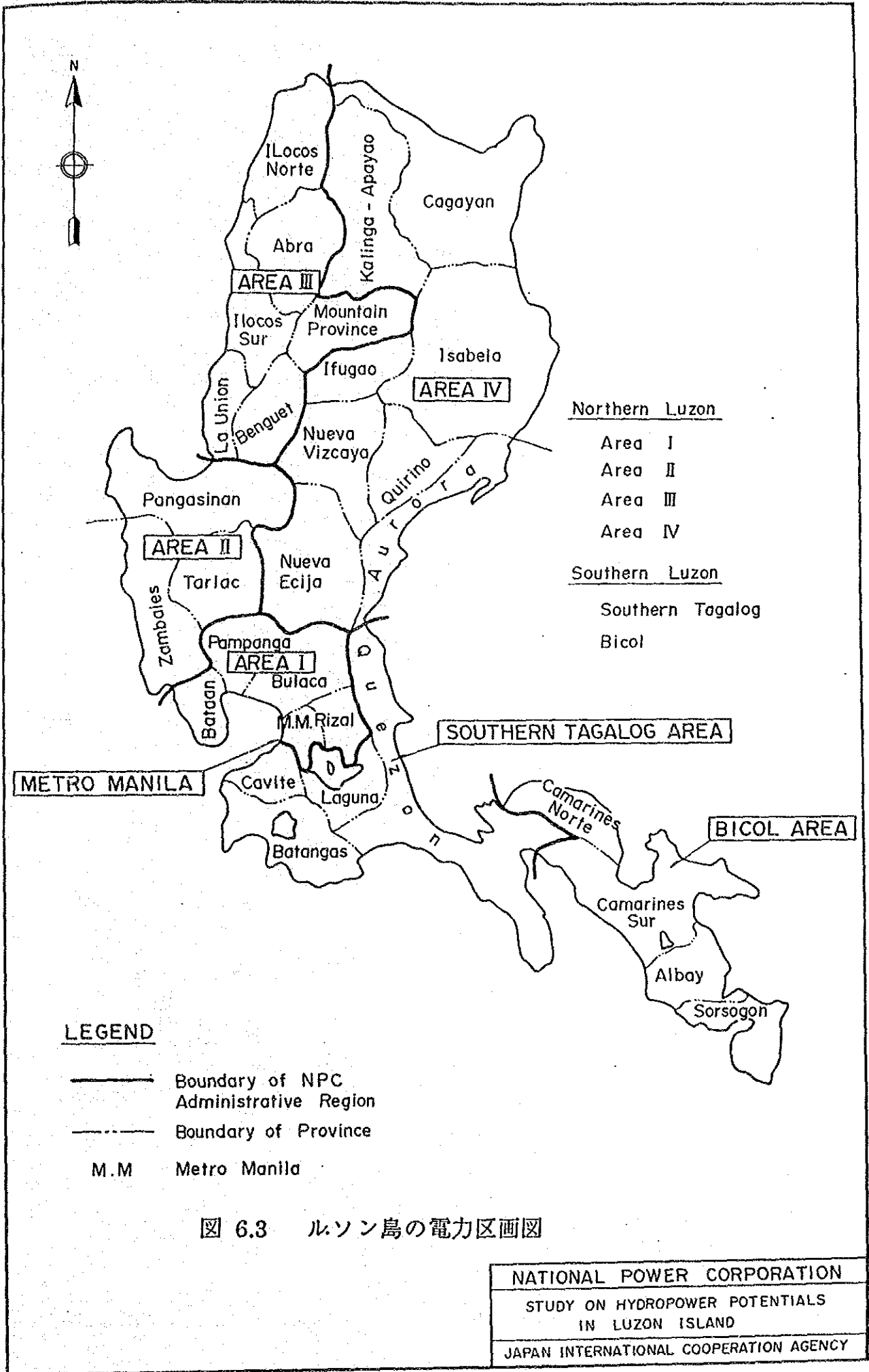
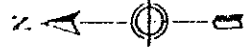


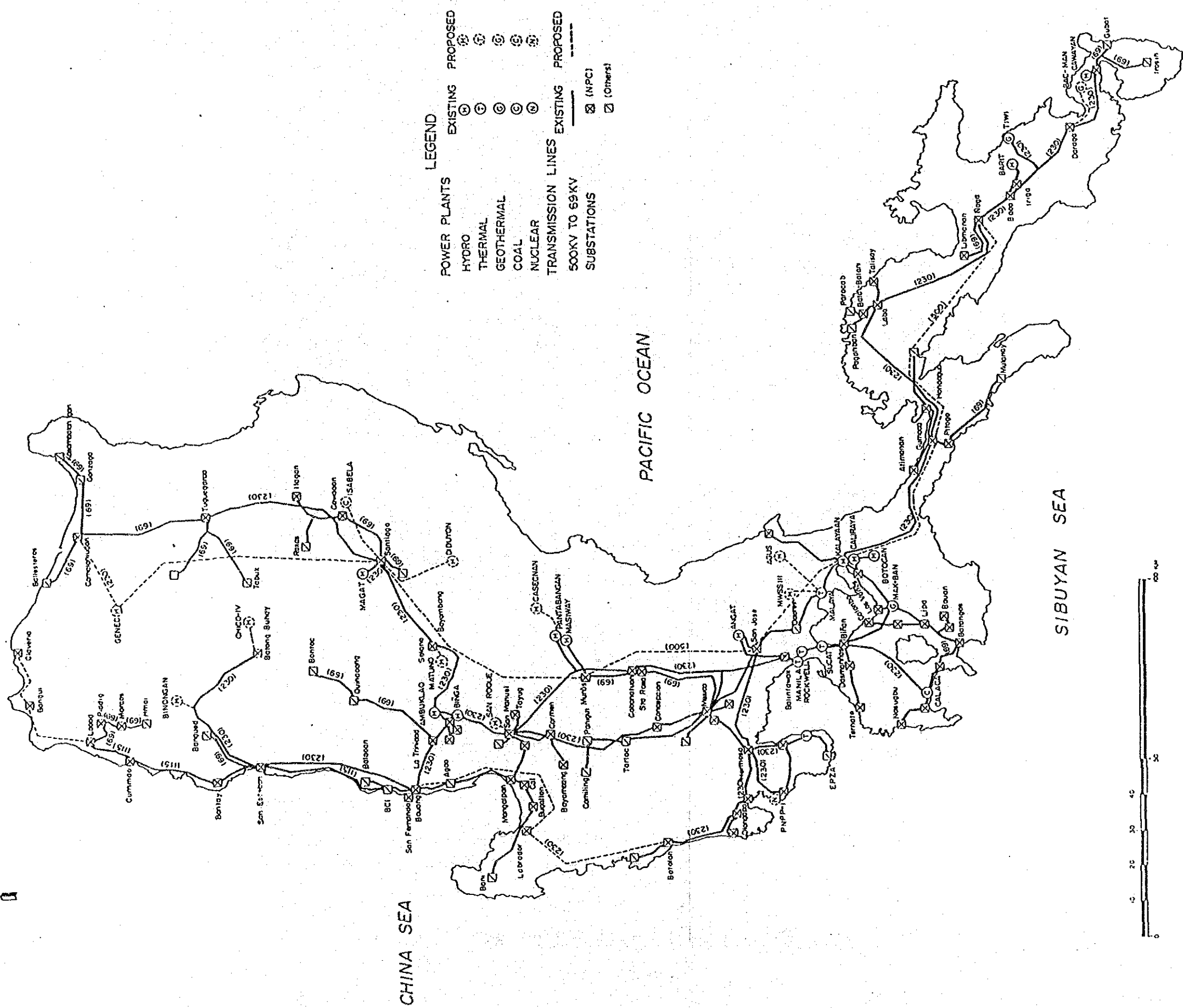
図 6.2 フィリピン電力公社の機構図

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BABUYAN CHANNEL



LEGEND

POWER PLANTS

HYDRO (H) EXISTING (H) PROPOSED (H)

THERMAL (T) EXISTING (T) PROPOSED (T)

GEOTHERMAL (G) EXISTING (G) PROPOSED (G)

COAL (C) EXISTING (C) PROPOSED (C)

NUCLEAR (N) EXISTING (N) PROPOSED (N)

TRANSMISSION LINES

500KV TO 69KV EXISTING (—) PROPOSED (---)

SUBSTATIONS

(X) (INPCI)

(□) (Others)

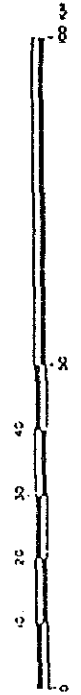


図 6.4 ルソン島の送電線系統図

APRIL 6, 1986 (SUN)
 PEAK LOAD = 1834 MW (1834 MW)
 LOAD FACTOR = 83 % (27 %)

APRIL 7, 1986 (MON)
 PEAK LOAD = 2168 MW (2168 MW)
 LOAD FACTOR = 83 % (81 %)

APRIL 8, 1986 (TUE)
 PEAK LOAD = 2185 MW (2185 MW)
 LOAD FACTOR = 88 % (78 %)

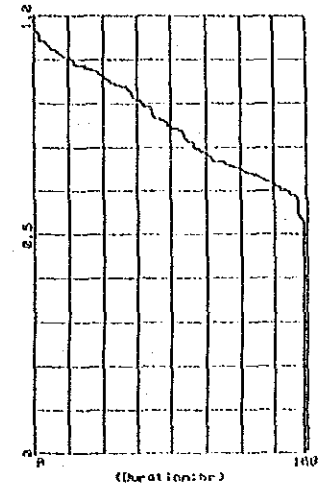
APRIL 9, 1986 (WED)
 PEAK LOAD = 2247 MW
 LOAD FACTOR = 81 %

APRIL 10, 1986 (THU)
 PEAK LOAD = 2241 MW
 LOAD FACTOR = 81 %

APRIL 11, 1986 (FRI)
 PEAK LOAD = 2328 MW
 LOAD FACTOR = 88 %

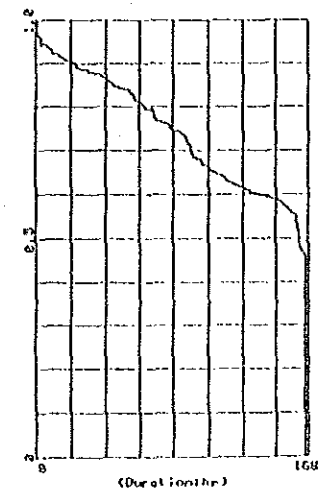
APRIL 12, 1986 (SAT)
 PEAK LOAD = 2171 MW (2171 MW)
 LOAD FACTOR = 88 % (88 %)

LOAD DURATION CURVE
 (APRIL 6-12), L.F. = 76 %

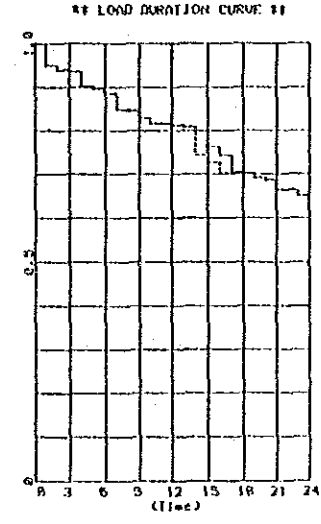
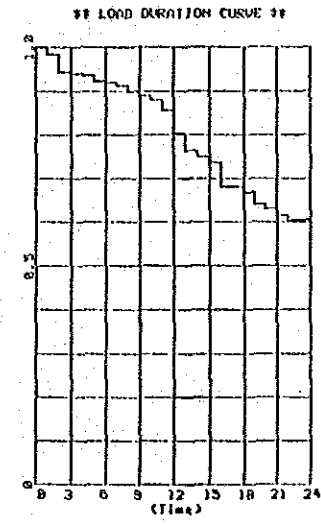
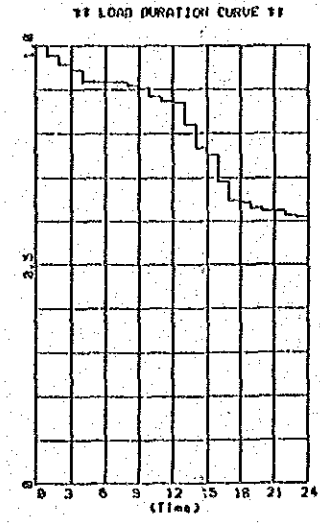
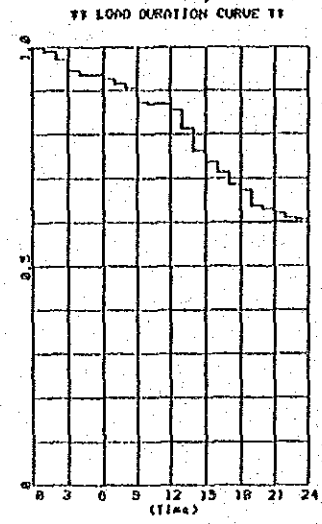
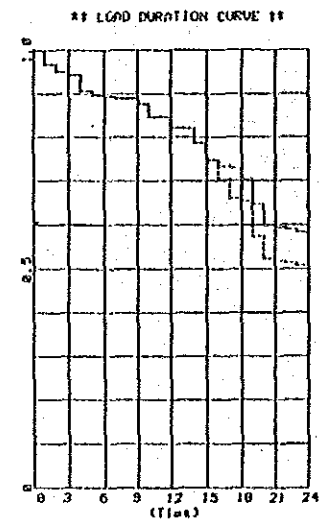
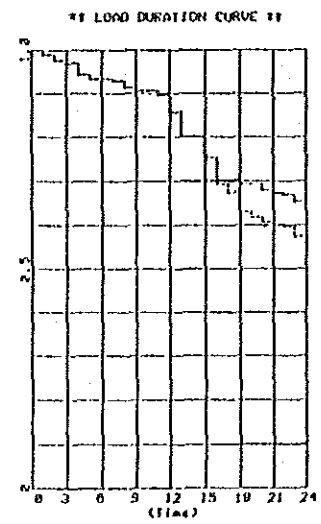
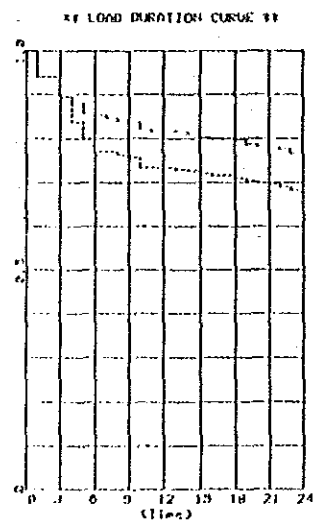
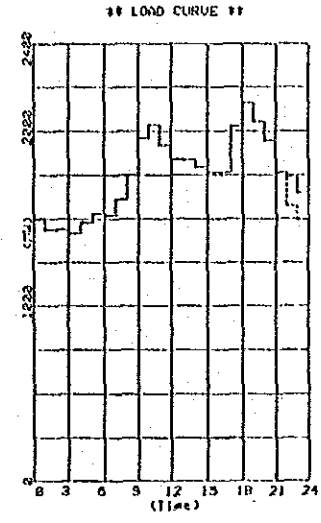
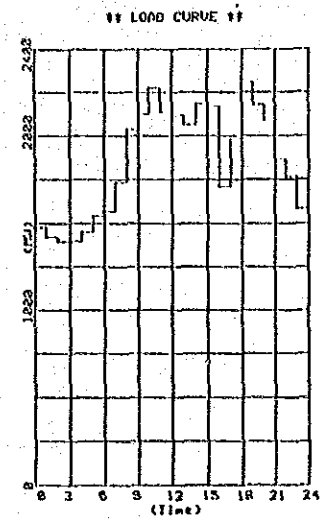
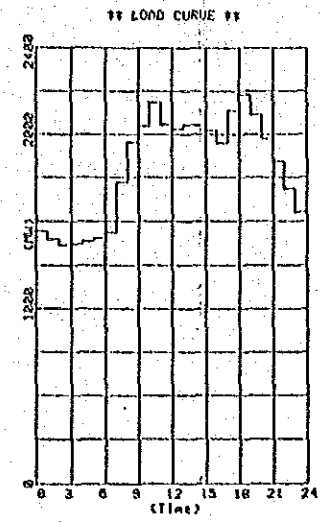
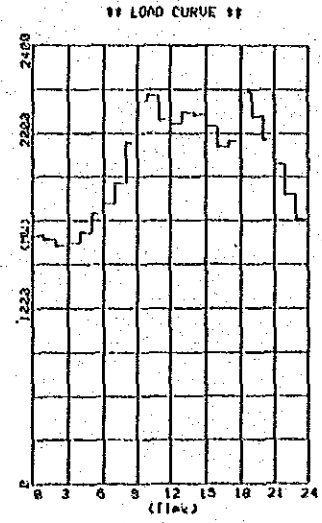
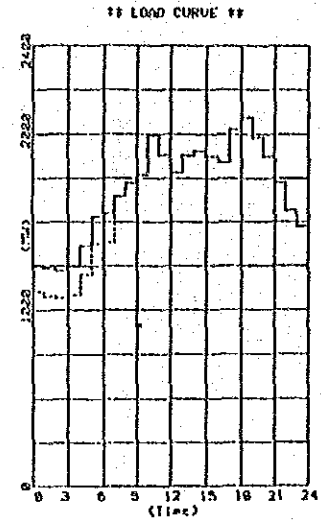
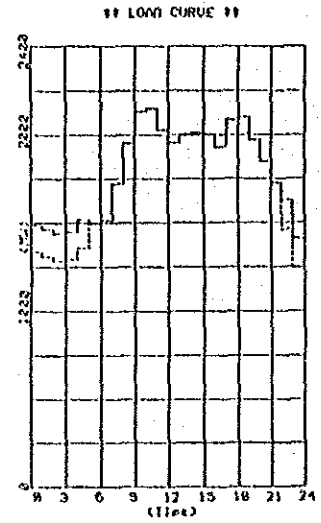
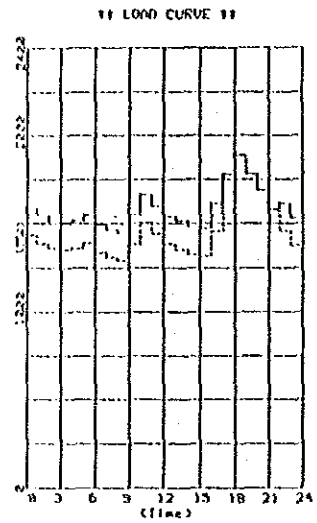


REMARK: INCL. POWER FOR PUMPING.

LOAD DURATION CURVE
 (APRIL 6-12), L.F. = 74 %



REMARK: EXCL. POWER FOR PUMPING.



Remarks: (1): Figures in parenthesis show peak load and load factor in case of w/o pumping for Kalayaan P/S.
 (2): Dotted lines show load duration curve in case of w/o pumping for Kalayaan P/S.

図 6.5 代表的な日負荷曲線及び日負荷継続曲線(1986年4月6日-12日)

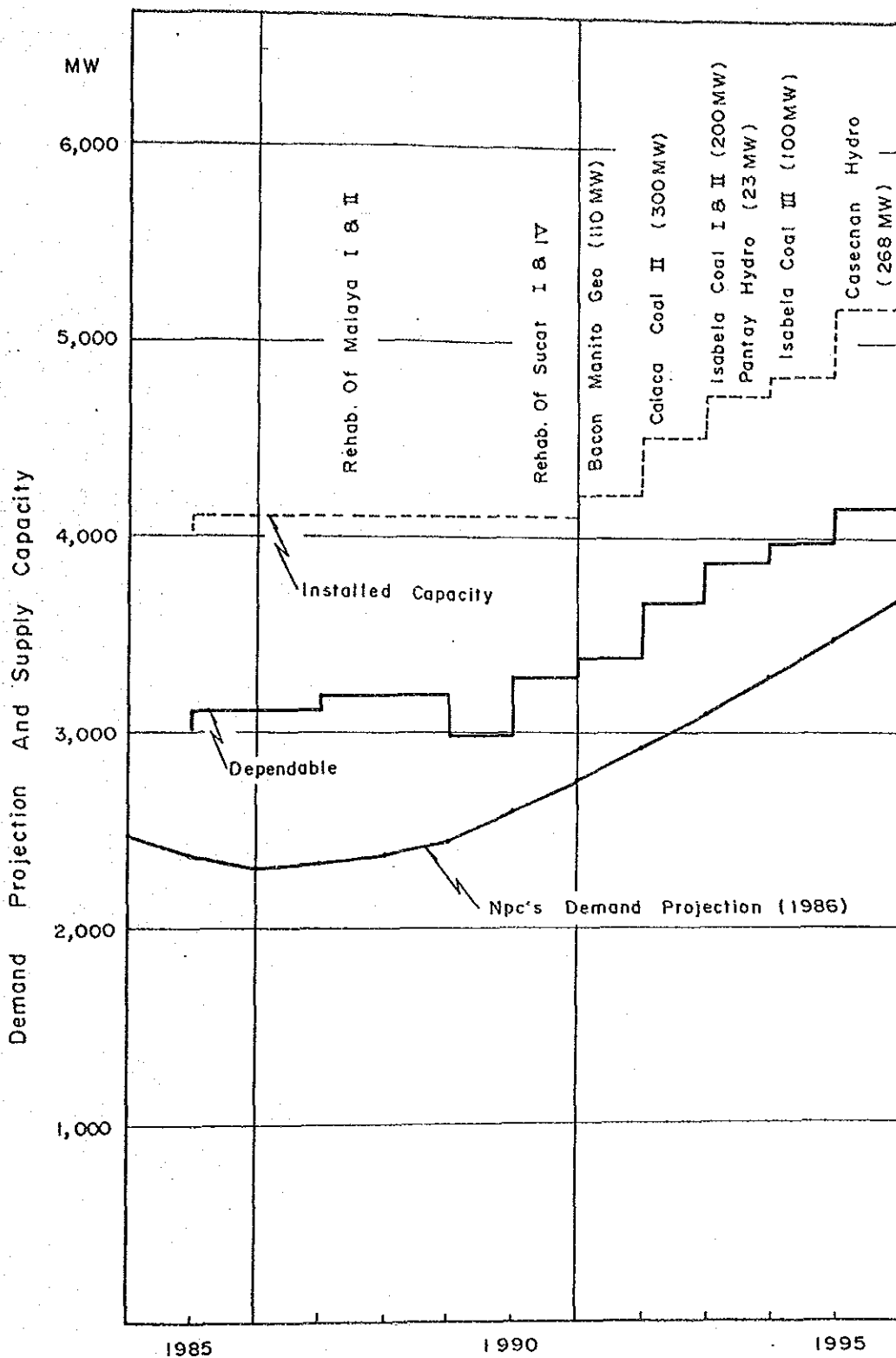
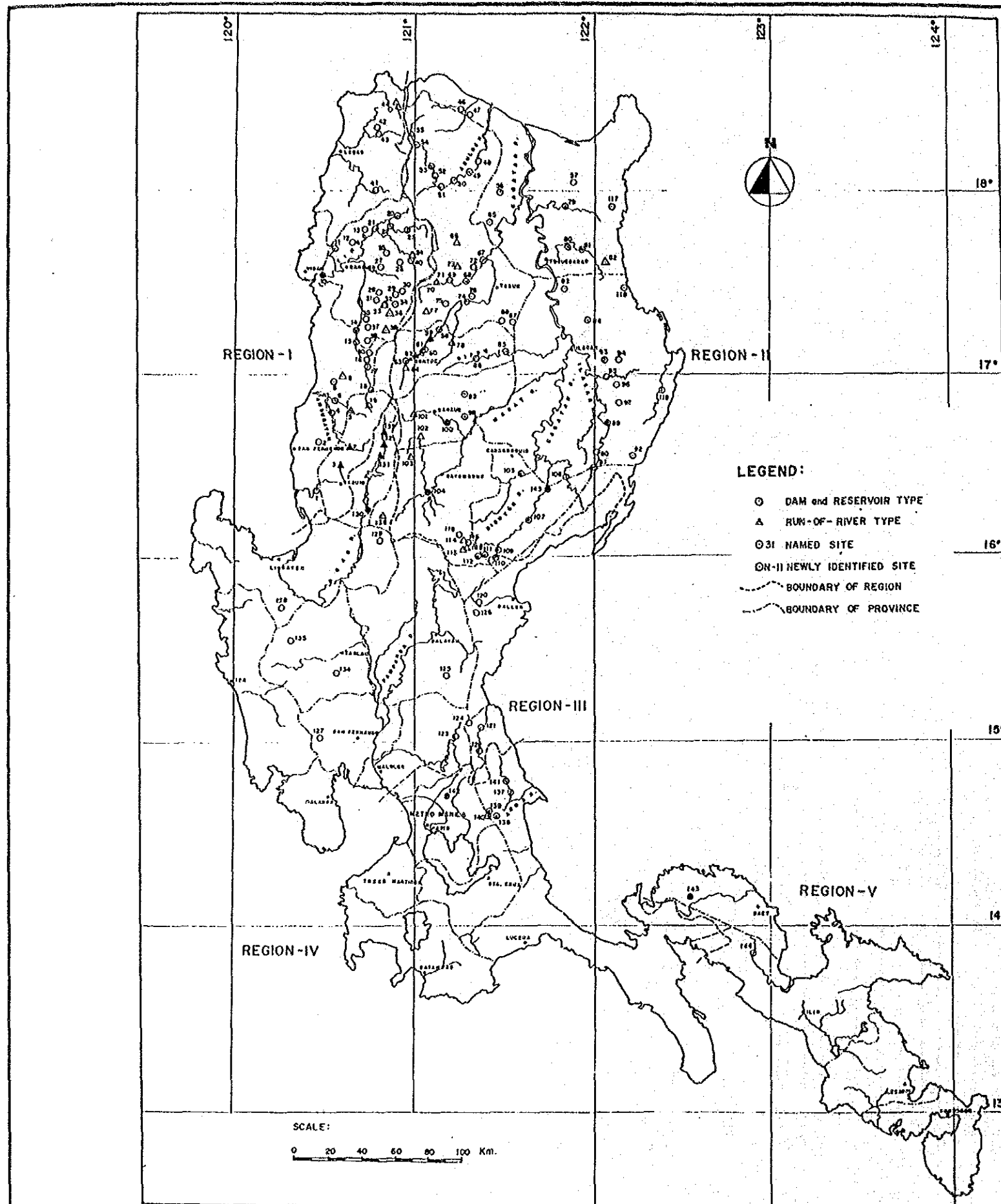


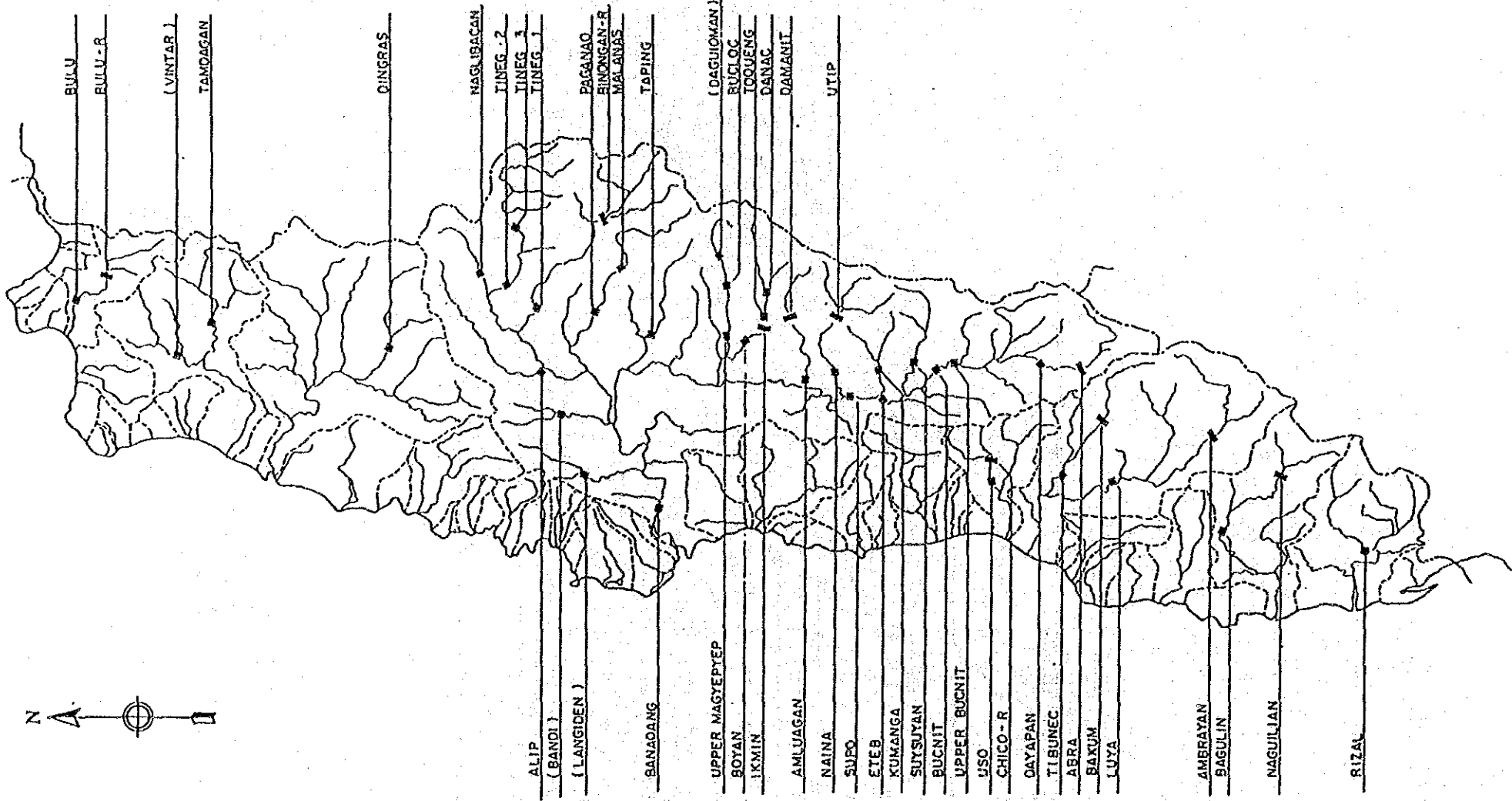
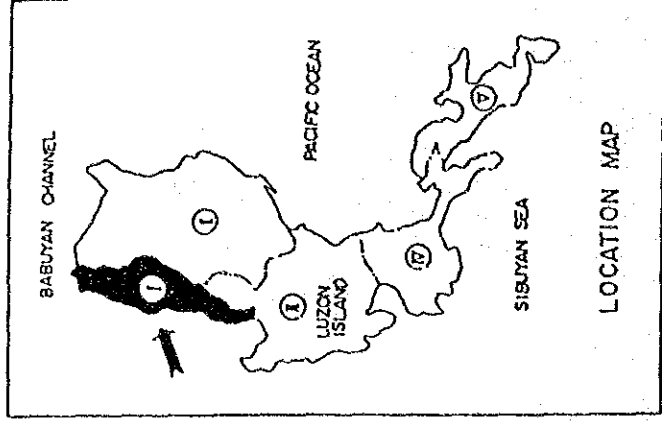
図 6.6 ルソン系統の電力需要予測及び設備投入計画(1986年-1995年)

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List of Assessment Sites

| NO. | PROJECT ID # | PROJECT NAME | NO. | PROJECT ID # | PROJECT NAME | NO. | PROJECT ID # | PROJECT NAME |
|-----|---------------|--------------|-----|--------------|--------------|-----|--------------|--------------|
| 1 | 1-0-1-0 | REAL | 51 | 1-27-1-22-0 | BOYAN | 81 | 2-0-3-4-0 | ENHOC-2A |
| 2 | 1-1-0-1-0 | WAGLAN | 52 | 1-27-1-23-0 | LOYAN | 82 | 2-0-3-4-0 | ENHOC-2B |
| 3 | 1-2-0-2-0 | WAGLAN | 53 | 1-27-1-24-0 | LOYAN | 83 | 2-0-3-4-0 | ENHOC-2C |
| 4 | 1-3-0-3-0 | WAGLAN | 54 | 1-27-1-25-0 | LOYAN | 84 | 2-0-3-4-0 | ENHOC-2D |
| 5 | 1-4-0-4-0 | WAGLAN | 55 | 1-27-1-26-0 | LOYAN | 85 | 2-0-3-4-0 | ENHOC-2E |
| 6 | 1-5-0-5-0 | WAGLAN | 56 | 1-27-1-27-0 | LOYAN | 86 | 2-0-3-4-0 | ENHOC-2F |
| 7 | 1-6-0-6-0 | WAGLAN | 57 | 1-27-1-28-0 | LOYAN | 87 | 2-0-3-4-0 | ENHOC-2G |
| 8 | 1-7-0-7-0 | WAGLAN | 58 | 1-27-1-29-0 | LOYAN | 88 | 2-0-3-4-0 | ENHOC-2H |
| 9 | 1-8-0-8-0 | WAGLAN | 59 | 1-27-1-30-0 | LOYAN | 89 | 2-0-3-4-0 | ENHOC-2I |
| 10 | 1-9-0-9-0 | WAGLAN | 60 | 1-27-1-31-0 | LOYAN | 90 | 2-0-3-4-0 | ENHOC-2J |
| 11 | 1-10-0-10-0 | WAGLAN | 61 | 1-27-1-32-0 | LOYAN | 91 | 2-0-3-4-0 | ENHOC-2K |
| 12 | 1-11-0-11-0 | WAGLAN | 62 | 1-27-1-33-0 | LOYAN | 92 | 2-0-3-4-0 | ENHOC-2L |
| 13 | 1-12-0-12-0 | WAGLAN | 63 | 1-27-1-34-0 | LOYAN | 93 | 2-0-3-4-0 | ENHOC-2M |
| 14 | 1-13-0-13-0 | WAGLAN | 64 | 1-27-1-35-0 | LOYAN | 94 | 2-0-3-4-0 | ENHOC-2N |
| 15 | 1-14-0-14-0 | WAGLAN | 65 | 1-27-1-36-0 | LOYAN | 95 | 2-0-3-4-0 | ENHOC-2O |
| 16 | 1-15-0-15-0 | WAGLAN | 66 | 1-27-1-37-0 | LOYAN | 96 | 2-0-3-4-0 | ENHOC-2P |
| 17 | 1-16-0-16-0 | WAGLAN | 67 | 1-27-1-38-0 | LOYAN | 97 | 2-0-3-4-0 | ENHOC-2Q |
| 18 | 1-17-0-17-0 | WAGLAN | 68 | 1-27-1-39-0 | LOYAN | 98 | 2-0-3-4-0 | ENHOC-2R |
| 19 | 1-18-0-18-0 | WAGLAN | 69 | 1-27-1-40-0 | LOYAN | 99 | 2-0-3-4-0 | ENHOC-2S |
| 20 | 1-19-0-19-0 | WAGLAN | 70 | 1-27-1-41-0 | LOYAN | 100 | 2-0-3-4-0 | ENHOC-2T |
| 21 | 1-20-0-20-0 | WAGLAN | 71 | 1-27-1-42-0 | LOYAN | 101 | 2-0-3-4-0 | ENHOC-2U |
| 22 | 1-21-0-21-0 | WAGLAN | 72 | 1-27-1-43-0 | LOYAN | 102 | 2-0-3-4-0 | ENHOC-2V |
| 23 | 1-22-0-22-0 | WAGLAN | 73 | 1-27-1-44-0 | LOYAN | 103 | 2-0-3-4-0 | ENHOC-2W |
| 24 | 1-23-0-23-0 | WAGLAN | 74 | 1-27-1-45-0 | LOYAN | 104 | 2-0-3-4-0 | ENHOC-2X |
| 25 | 1-24-0-24-0 | WAGLAN | 75 | 1-27-1-46-0 | LOYAN | 105 | 2-0-3-4-0 | ENHOC-2Y |
| 26 | 1-25-0-25-0 | WAGLAN | 76 | 1-27-1-47-0 | LOYAN | 106 | 2-0-3-4-0 | ENHOC-2Z |
| 27 | 1-26-0-26-0 | WAGLAN | 77 | 1-27-1-48-0 | LOYAN | 107 | 2-0-3-4-0 | ENHOC-3A |
| 28 | 1-27-0-27-0 | WAGLAN | 78 | 1-27-1-49-0 | LOYAN | 108 | 2-0-3-4-0 | ENHOC-3B |
| 29 | 1-28-0-28-0 | WAGLAN | 79 | 1-27-1-50-0 | LOYAN | 109 | 2-0-3-4-0 | ENHOC-3C |
| 30 | 1-29-0-29-0 | WAGLAN | 80 | 1-27-1-51-0 | LOYAN | 110 | 2-0-3-4-0 | ENHOC-3D |
| 31 | 1-30-0-30-0 | WAGLAN | 81 | 1-27-1-52-0 | LOYAN | 111 | 2-0-3-4-0 | ENHOC-3E |
| 32 | 1-31-0-31-0 | WAGLAN | 82 | 1-27-1-53-0 | LOYAN | 112 | 2-0-3-4-0 | ENHOC-3F |
| 33 | 1-32-0-32-0 | WAGLAN | 83 | 1-27-1-54-0 | LOYAN | 113 | 2-0-3-4-0 | ENHOC-3G |
| 34 | 1-33-0-33-0 | WAGLAN | 84 | 1-27-1-55-0 | LOYAN | 114 | 2-0-3-4-0 | ENHOC-3H |
| 35 | 1-34-0-34-0 | WAGLAN | 85 | 1-27-1-56-0 | LOYAN | 115 | 2-0-3-4-0 | ENHOC-3I |
| 36 | 1-35-0-35-0 | WAGLAN | 86 | 1-27-1-57-0 | LOYAN | 116 | 2-0-3-4-0 | ENHOC-3J |
| 37 | 1-36-0-36-0 | WAGLAN | 87 | 1-27-1-58-0 | LOYAN | 117 | 2-0-3-4-0 | ENHOC-3K |
| 38 | 1-37-0-37-0 | WAGLAN | 88 | 1-27-1-59-0 | LOYAN | 118 | 2-0-3-4-0 | ENHOC-3L |
| 39 | 1-38-0-38-0 | WAGLAN | 89 | 1-27-1-60-0 | LOYAN | 119 | 2-0-3-4-0 | ENHOC-3M |
| 40 | 1-39-0-39-0 | WAGLAN | 90 | 1-27-1-61-0 | LOYAN | 120 | 2-0-3-4-0 | ENHOC-3N |
| 41 | 1-40-0-40-0 | WAGLAN | 91 | 1-27-1-62-0 | LOYAN | 121 | 2-0-3-4-0 | ENHOC-3O |
| 42 | 1-41-0-41-0 | WAGLAN | 92 | 1-27-1-63-0 | LOYAN | 122 | 2-0-3-4-0 | ENHOC-3P |
| 43 | 1-42-0-42-0 | WAGLAN | 93 | 1-27-1-64-0 | LOYAN | 123 | 2-0-3-4-0 | ENHOC-3Q |
| 44 | 1-43-0-43-0 | WAGLAN | 94 | 1-27-1-65-0 | LOYAN | 124 | 2-0-3-4-0 | ENHOC-3R |
| 45 | 1-44-0-44-0 | WAGLAN | 95 | 1-27-1-66-0 | LOYAN | 125 | 2-0-3-4-0 | ENHOC-3S |
| 46 | 1-45-0-45-0 | WAGLAN | 96 | 1-27-1-67-0 | LOYAN | 126 | 2-0-3-4-0 | ENHOC-3T |
| 47 | 1-46-0-46-0 | WAGLAN | 97 | 1-27-1-68-0 | LOYAN | 127 | 2-0-3-4-0 | ENHOC-3U |
| 48 | 1-47-0-47-0 | WAGLAN | 98 | 1-27-1-69-0 | LOYAN | 128 | 2-0-3-4-0 | ENHOC-3V |
| 49 | 1-48-0-48-0 | WAGLAN | 99 | 1-27-1-70-0 | LOYAN | 129 | 2-0-3-4-0 | ENHOC-3W |
| 50 | 1-49-0-49-0 | WAGLAN | 100 | 1-27-1-71-0 | LOYAN | 130 | 2-0-3-4-0 | ENHOC-3X |
| 51 | 1-50-0-50-0 | WAGLAN | 101 | 1-27-1-72-0 | LOYAN | 131 | 2-0-3-4-0 | ENHOC-3Y |
| 52 | 1-51-0-51-0 | WAGLAN | 102 | 1-27-1-73-0 | LOYAN | 132 | 2-0-3-4-0 | ENHOC-3Z |
| 53 | 1-52-0-52-0 | WAGLAN | 103 | 1-27-1-74-0 | LOYAN | 133 | 2-0-3-4-0 | ENHOC-4A |
| 54 | 1-53-0-53-0 | WAGLAN | 104 | 1-27-1-75-0 | LOYAN | 134 | 2-0-3-4-0 | ENHOC-4B |
| 55 | 1-54-0-54-0 | WAGLAN | 105 | 1-27-1-76-0 | LOYAN | 135 | 2-0-3-4-0 | ENHOC-4C |
| 56 | 1-55-0-55-0 | WAGLAN | 106 | 1-27-1-77-0 | LOYAN | 136 | 2-0-3-4-0 | ENHOC-4D |
| 57 | 1-56-0-56-0 | WAGLAN | 107 | 1-27-1-78-0 | LOYAN | 137 | 2-0-3-4-0 | ENHOC-4E |
| 58 | 1-57-0-57-0 | WAGLAN | 108 | 1-27-1-79-0 | LOYAN | 138 | 2-0-3-4-0 | ENHOC-4F |
| 59 | 1-58-0-58-0 | WAGLAN | 109 | 1-27-1-80-0 | LOYAN | 139 | 2-0-3-4-0 | ENHOC-4G |
| 60 | 1-59-0-59-0 | WAGLAN | 110 | 1-27-1-81-0 | LOYAN | 140 | 2-0-3-4-0 | ENHOC-4H |
| 61 | 1-60-0-60-0 | WAGLAN | 111 | 1-27-1-82-0 | LOYAN | 141 | 2-0-3-4-0 | ENHOC-4I |
| 62 | 1-61-0-61-0 | WAGLAN | 112 | 1-27-1-83-0 | LOYAN | 142 | 2-0-3-4-0 | ENHOC-4J |
| 63 | 1-62-0-62-0 | WAGLAN | 113 | 1-27-1-84-0 | LOYAN | 143 | 2-0-3-4-0 | ENHOC-4K |
| 64 | 1-63-0-63-0 | WAGLAN | 114 | 1-27-1-85-0 | LOYAN | 144 | 2-0-3-4-0 | ENHOC-4L |
| 65 | 1-64-0-64-0 | WAGLAN | 115 | 1-27-1-86-0 | LOYAN | 145 | 2-0-3-4-0 | ENHOC-4M |
| 66 | 1-65-0-65-0 | WAGLAN | 116 | 1-27-1-87-0 | LOYAN | 146 | 2-0-3-4-0 | ENHOC-4N |
| 67 | 1-66-0-66-0 | WAGLAN | 117 | 1-27-1-88-0 | LOYAN | 147 | 2-0-3-4-0 | ENHOC-4O |
| 68 | 1-67-0-67-0 | WAGLAN | 118 | 1-27-1-89-0 | LOYAN | 148 | 2-0-3-4-0 | ENHOC-4P |
| 69 | 1-68-0-68-0 | WAGLAN | 119 | 1-27-1-90-0 | LOYAN | 149 | 2-0-3-4-0 | ENHOC-4Q |
| 70 | 1-69-0-69-0 | WAGLAN | 120 | 1-27-1-91-0 | LOYAN | 150 | 2-0-3-4-0 | ENHOC-4R |
| 71 | 1-70-0-70-0 | WAGLAN | 121 | 1-27-1-92-0 | LOYAN | 151 | 2-0-3-4-0 | ENHOC-4S |
| 72 | 1-71-0-71-0 | WAGLAN | 122 | 1-27-1-93-0 | LOYAN | 152 | 2-0-3-4-0 | ENHOC-4T |
| 73 | 1-72-0-72-0 | WAGLAN | 123 | 1-27-1-94-0 | LOYAN | 153 | 2-0-3-4-0 | ENHOC-4U |
| 74 | 1-73-0-73-0 | WAGLAN | 124 | 1-27-1-95-0 | LOYAN | 154 | 2-0-3-4-0 | ENHOC-4V |
| 75 | 1-74-0-74-0 | WAGLAN | 125 | 1-27-1-96-0 | LOYAN | 155 | 2-0-3-4-0 | ENHOC-4W |
| 76 | 1-75-0-75-0 | WAGLAN | 126 | 1-27-1-97-0 | LOYAN | 156 | 2-0-3-4-0 | ENHOC-4X |
| 77 | 1-76-0-76-0 | WAGLAN | 127 | 1-27-1-98-0 | LOYAN | 157 | 2-0-3-4-0 | ENHOC-4Y |
| 78 | 1-77-0-77-0 | WAGLAN | 128 | 1-27-1-99-0 | LOYAN | 158 | 2-0-3-4-0 | ENHOC-4Z |
| 79 | 1-78-0-78-0 | WAGLAN | 129 | 1-27-1-100-0 | LOYAN | 159 | 2-0-3-4-0 | ENHOC-5A |
| 80 | 1-79-0-79-0 | WAGLAN | 130 | 1-27-1-101-0 | LOYAN | 160 | 2-0-3-4-0 | ENHOC-5B |
| 81 | 1-80-0-80-0 | WAGLAN | 131 | 1-27-1-102-0 | LOYAN | 161 | 2-0-3-4-0 | ENHOC-5C |
| 82 | 1-81-0-81-0 | WAGLAN | 132 | 1-27-1-103-0 | LOYAN | 162 | 2-0-3-4-0 | ENHOC-5D |
| 83 | 1-82-0-82-0 | WAGLAN | 133 | 1-27-1-104-0 | LOYAN | 163 | 2-0-3-4-0 | ENHOC-5E |
| 84 | 1-83-0-83-0 | WAGLAN | 134 | 1-27-1-105-0 | LOYAN | 164 | 2-0-3-4-0 | ENHOC-5F |
| 85 | 1-84-0-84-0 | WAGLAN | 135 | 1-27-1-106-0 | LOYAN | 165 | 2-0-3-4-0 | ENHOC-5G |
| 86 | 1-85-0-85-0 | WAGLAN | 136 | 1-27-1-107-0 | LOYAN | 166 | 2-0-3-4-0 | ENHOC-5H |
| 87 | 1-86-0-86-0 | WAGLAN | 137 | 1-27-1-108-0 | LOYAN | 167 | 2-0-3-4-0 | ENHOC-5I |
| 88 | 1-87-0-87-0 | WAGLAN | 138 | 1-27-1-109-0 | LOYAN | 168 | 2-0-3-4-0 | ENHOC-5J |
| 89 | 1-88-0-88-0 | WAGLAN | 139 | 1-27-1-110-0 | LOYAN | 169 | 2-0-3-4-0 | ENHOC-5K |
| 90 | 1-89-0-89-0 | WAGLAN | 140 | 1-27-1-111-0 | LOYAN | 170 | 2-0-3-4-0 | ENHOC-5L |
| 91 | 1-90-0-90-0 | WAGLAN | 141 | 1-27-1-112-0 | LOYAN | 171 | 2-0-3-4-0 | ENHOC-5M |
| 92 | 1-91-0-91-0 | WAGLAN | 142 | 1-27-1-113-0 | LOYAN | 172 | 2-0-3-4-0 | ENHOC-5N |
| 93 | 1-92-0-92-0 | WAGLAN | 143 | 1-27-1-114-0 | LOYAN | 173 | 2-0-3-4-0 | ENHOC-5O |
| 94 | 1-93-0-93-0 | WAGLAN | 144 | 1-27-1-115-0 | LOYAN | 174 | 2-0-3-4-0 | ENHOC-5P |
| 95 | 1-94-0-94-0 | WAGLAN | 145 | 1-27-1-116-0 | LOYAN | 175 | 2-0-3-4-0 | ENHOC-5Q |
| 96 | 1-95-0-95-0 | WAGLAN | 146 | 1-27-1-117-0 | LOYAN | 176 | 2-0-3-4-0 | ENHOC-5R |
| 97 | 1-96-0-96-0 | WAGLAN | 147 | 1-27-1-118-0 | LOYAN | 177 | 2-0-3-4-0 | ENHOC-5S |
| 98 | 1-97-0-97-0 | WAGLAN | 148 | 1-27-1-119-0 | LOYAN | 178 | 2-0-3-4-0 | ENHOC-5T |
| 99 | 1-98-0-98-0 | WAGLAN | 149 | 1-27-1-120-0 | LOYAN | 179 | 2-0-3-4-0 | ENHOC-5U |
| 100 | 1-99-0-99-0 | WAGLAN | 150 | 1-27-1-121-0 | LOYAN | 180 | 2-0-3-4-0 | ENHOC-5V |
| 101 | 1-100-0-100-0 | WAGLAN | 151 | 1-27-1-122-0 | LOYAN | 181 | 2-0-3-4-0 | ENHOC-5W |
| 102 | 1-101-0-101-0 | WAGLAN | 152 | 1-27-1-123-0 | LOYAN | 182 | 2-0-3-4-0 | ENHOC-5X |
| 103 | 1-102-0-102-0 | WAGLAN | 153 | 1-27-1-124-0 | LOYAN | 183 | 2-0-3-4-0 | ENHOC-5Y |
| 104 | 1-103-0-103-0 | WAGLAN | 154 | 1-27-1-125-0 | LOYAN | 184 | 2-0-3-4-0 | ENHOC-5Z |
| 105 | 1-104-0-104-0 | WAGLAN | 155 | 1-27-1-126-0 | LOYAN | 185 | 2-0-3-4-0 | ENHOC-6A |
| 106 | 1-105-0-105-0 | WAGLAN | 156 | 1-27-1-127-0 | LOYAN | 186 | 2-0-3-4-0 | ENHOC-6B |
| 107 | 1-106-0-106-0 | WAGLAN | 157 | 1-27-1-128-0 | LOYAN | 187 | 2-0-3-4-0 | ENHOC-6C |
| 108 | 1-107-0-107-0 | WAGLAN | 158 | 1-27-1-129-0 | LOYAN | 188 | 2-0-3-4-0 | ENHOC-6D |
| 109 | 1-108-0-108-0 | WAGLAN | 159 | 1-27-1-130-0 | LOYAN | 189 | 2-0-3-4-0 | ENHOC-6E |
| 110 | 1-109-0-109-0 | WAGLAN | 160 | 1-27-1-131-0 | LOYAN | 190 | 2-0-3-4-0 | ENHOC-6F |
| 111 | 1-110-0-110-0 | WAGLAN | 161 | 1-27-1-132-0 | LOYAN | 191 | 2-0-3-4-0 | ENHOC-6G |
| 112 | 1-111-0-111-0 | WAGLAN | 162 | 1-27-1-133-0 | LOYAN | 192 | 2-0-3-4-0 | ENHOC-6H |
| 113 | 1-112-0-112-0 | WAGLAN | 163 | 1-27-1-134-0 | LOYAN | 193 | 2-0-3-4-0 | ENHOC-6I |
| 114 | 1-113-0-113-0 | WAGLAN | 164 | 1-27-1-135-0 | LOYAN | 194 | 2-0-3-4-0 | ENHOC-6J |
| 115 | 1-114-0-114-0 | WAGLAN | 165 | 1-27-1-136-0 | LOYAN | 195 | 2-0-3-4-0 | ENHOC-6K |
| 116 | 1-115-0-115-0 | WAGLAN | 166 | 1-27-1-137-0 | LOYAN | 196 | 2-0-3-4-0 | ENHOC-6L |
| 117 | 1-116-0-116-0 | WAGLAN | 167 | 1-27-1-138-0 | LOYAN | 197 | 2-0-3-4-0 | ENHOC-6M |
| 118 | 1-117-0-117-0 | WAGLAN | 168 | 1-27-1-139-0 | LOYAN | 198 | 2-0-3-4-0 | ENHOC-6N |
| 119 | 1-118-0-118-0 | WAGLAN | 169 | 1-27-1-140-0 | LOYAN | 199 | 2-0-3-4-0 | ENHOC-6O |
| 120 | 1-119-0-119-0 | WAGLAN | 170 | 1-27-1-141-0 | | | | |



LEGEND

- : Reservoir Type (Named)
- ▲ : Reservoir Type (Newly Identified)
- ▬ : R.O.R Type (Newly Identified)
- ⋯ : Boundary of Water Resources Region
- ⋯ : Boundary of River Basin
- : River / Stream

图 7.2 計畫水力地点位置图, 水資源区 1

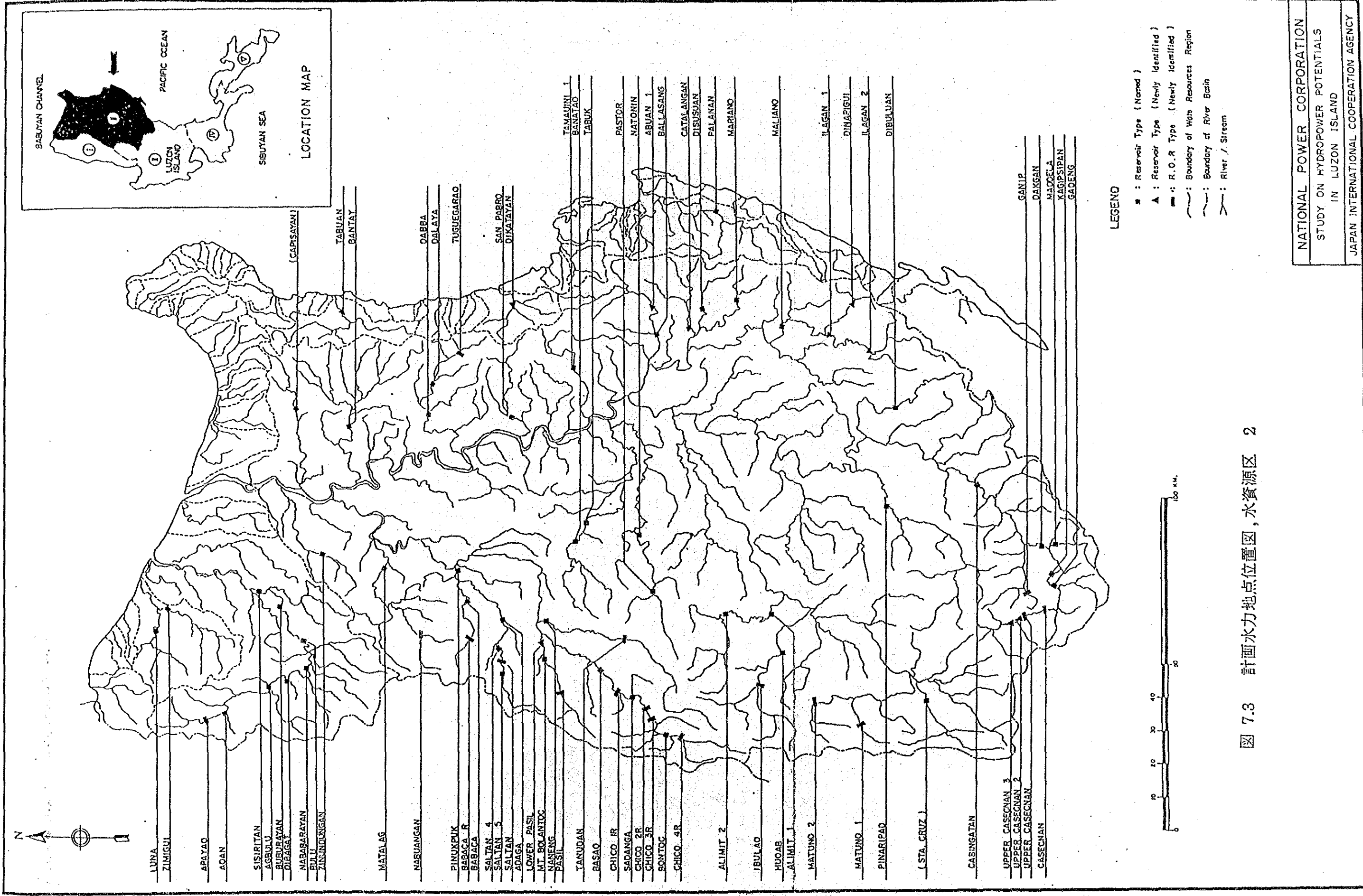


图 7.3 計畫水力地点位置图, 水资源区 2

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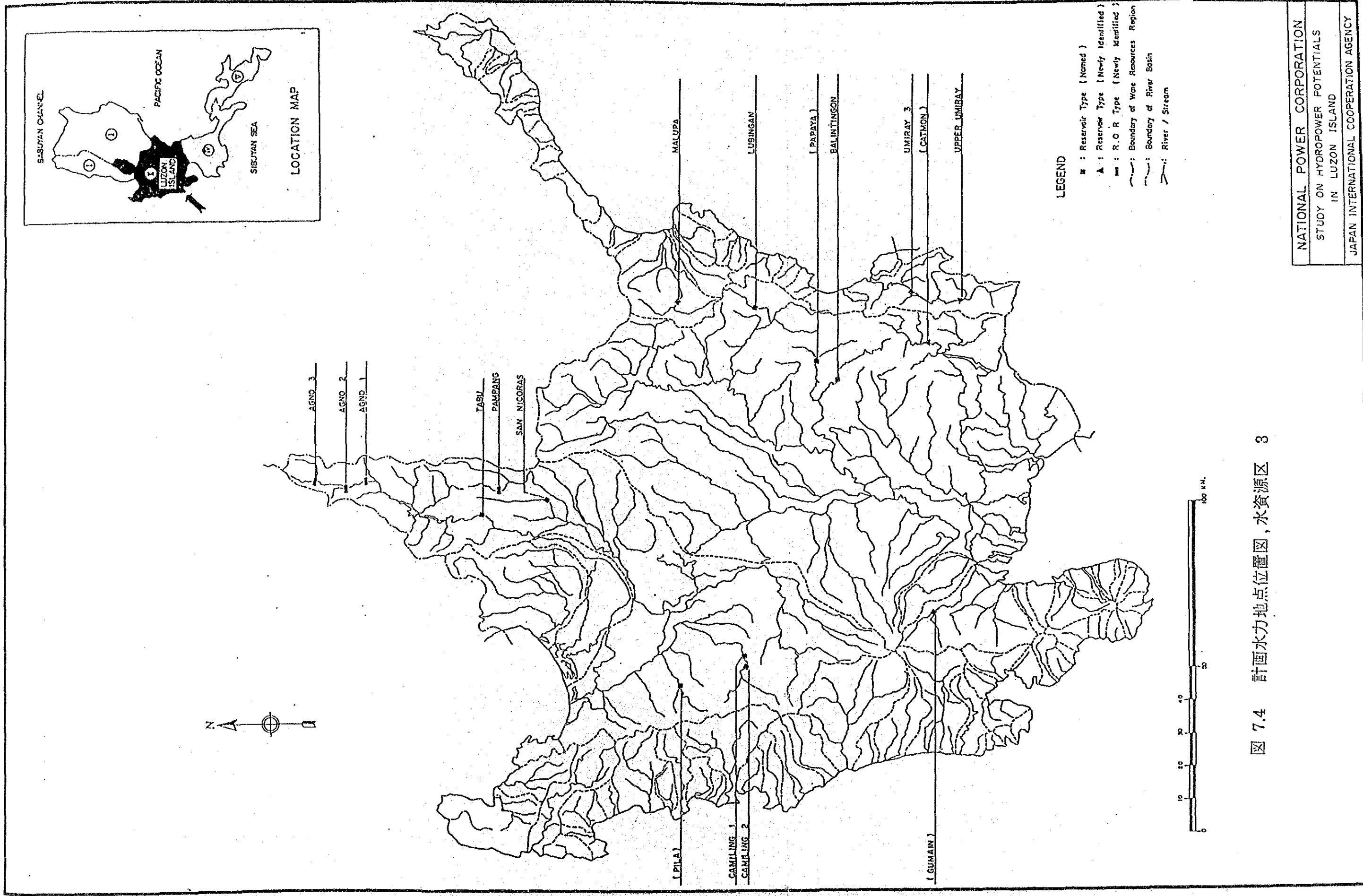


图 7.4 計画水力地点位置图, 水资源区 3

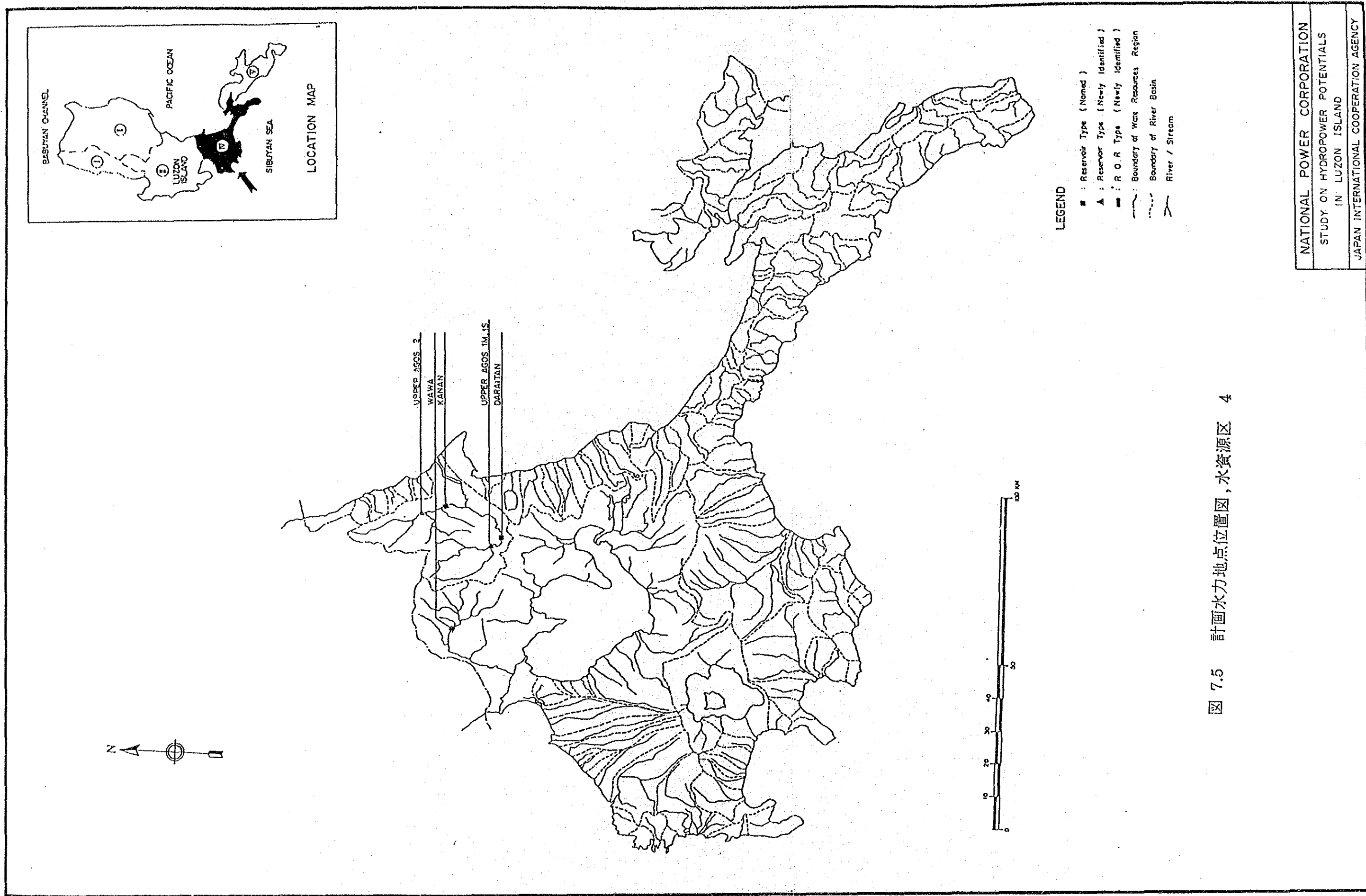


图 7.5 計画水力地点位置図, 水資源区 4

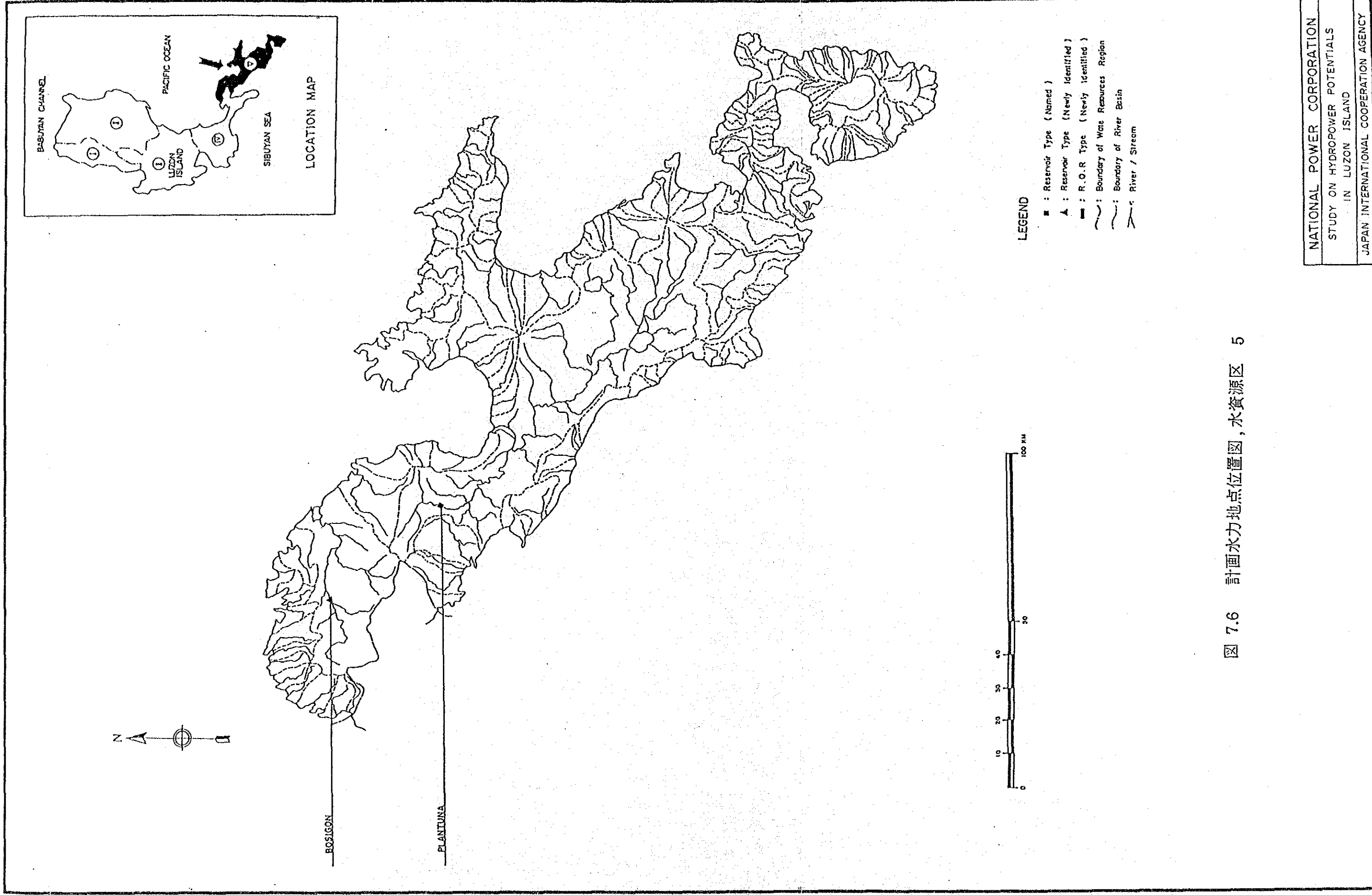


图 7.6 計畫水力地点位置图, 水资源区 5

Station ID : 41008 NW106
 Station : Bumagcat
 River : Abra

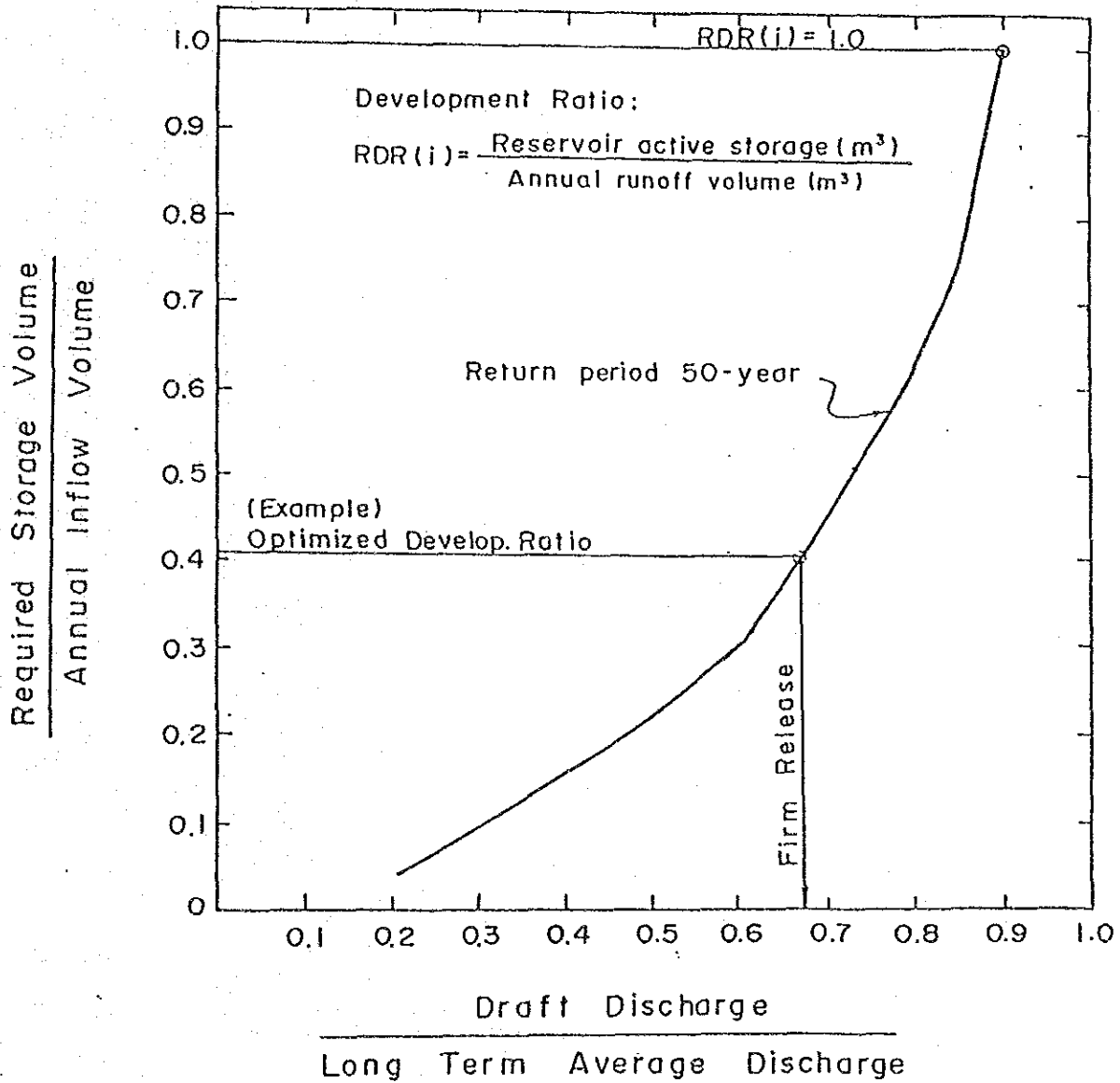


圖 8.1 貯水池利用曲線

Station ID NO. : 41008 NW 106
 Station : Bumagcat
 River : Abra

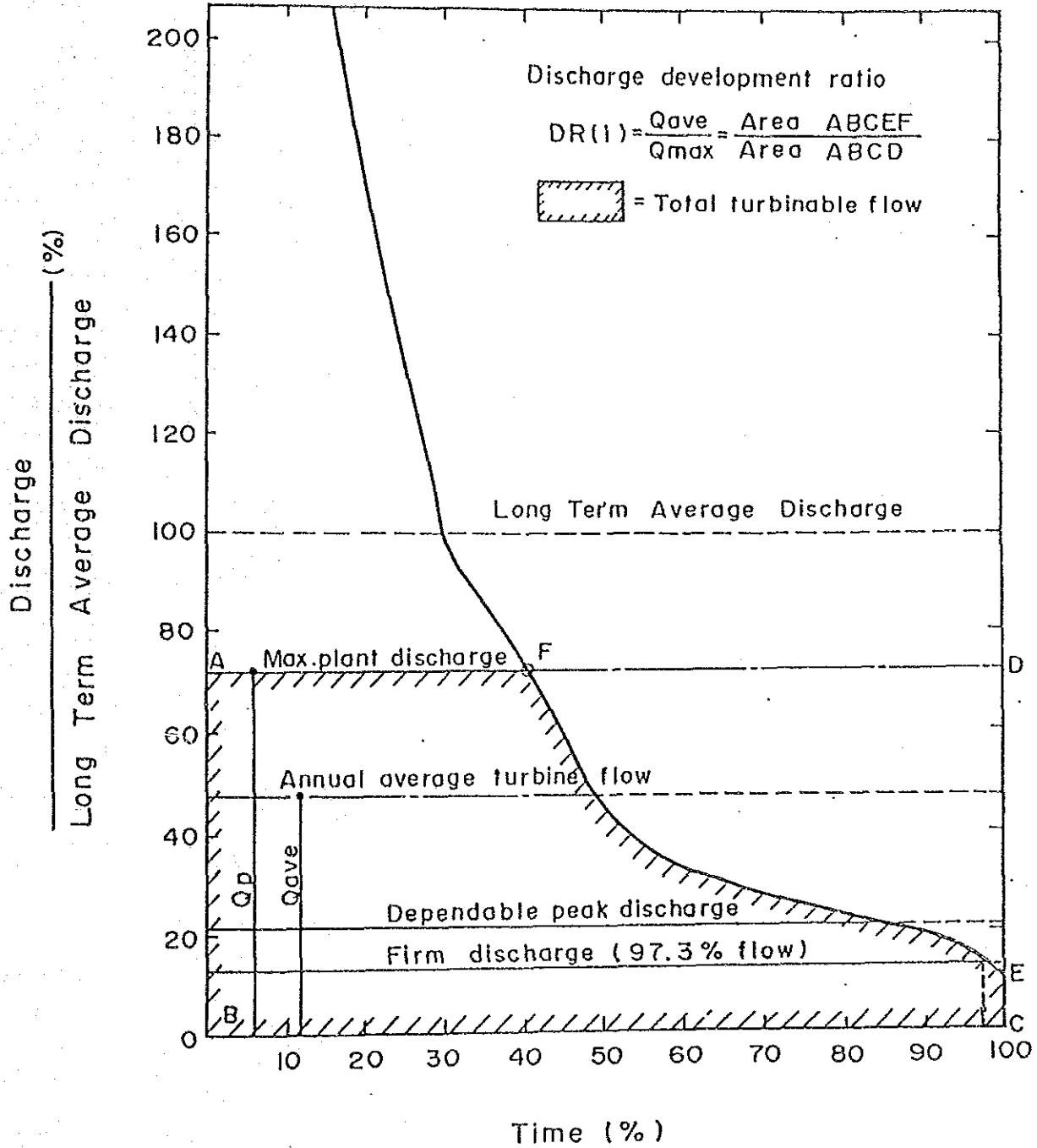
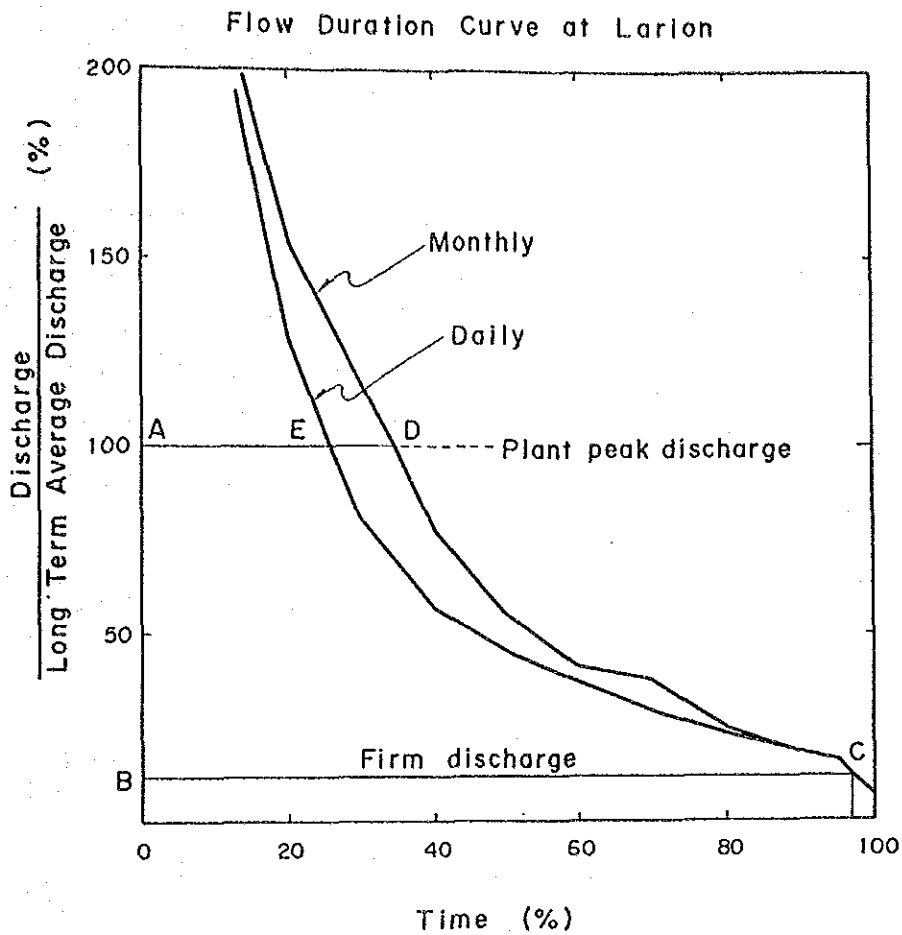


图 8.2 流況曲線



$$\frac{\text{Secondary Energy estimated by Daily Curve}}{\text{Secondary Energy estimated by Monthly Curve}}$$

$$= \frac{\text{Area ABCE}}{\text{Area ABCD}}$$

≈ 0.9

図 8.3 月流況曲線と日流況曲線から算定される二次エネルギーの比較

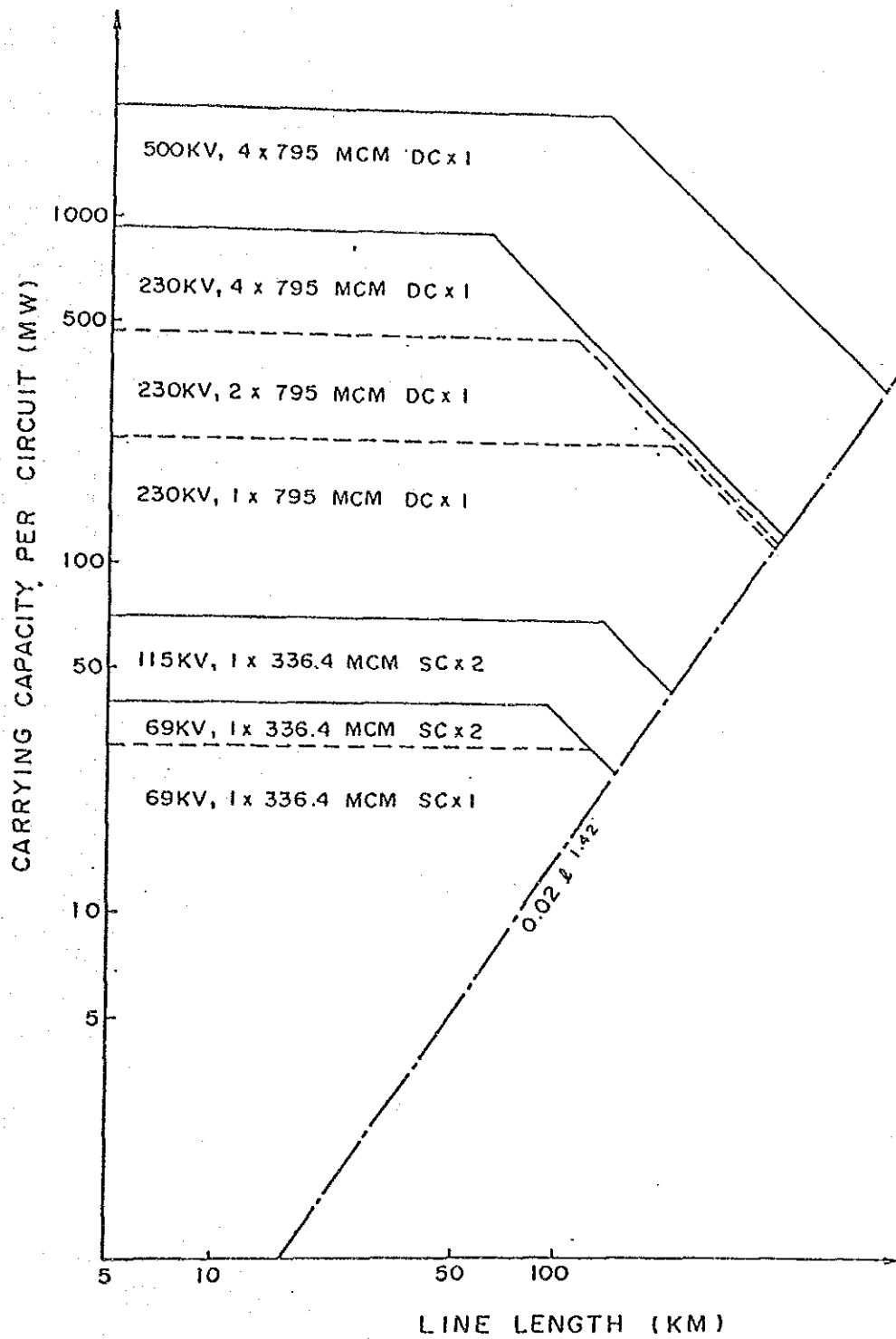


図 9.1 送電線容量と送電線長の関係

1ST SCREENING

2ND SCREENING

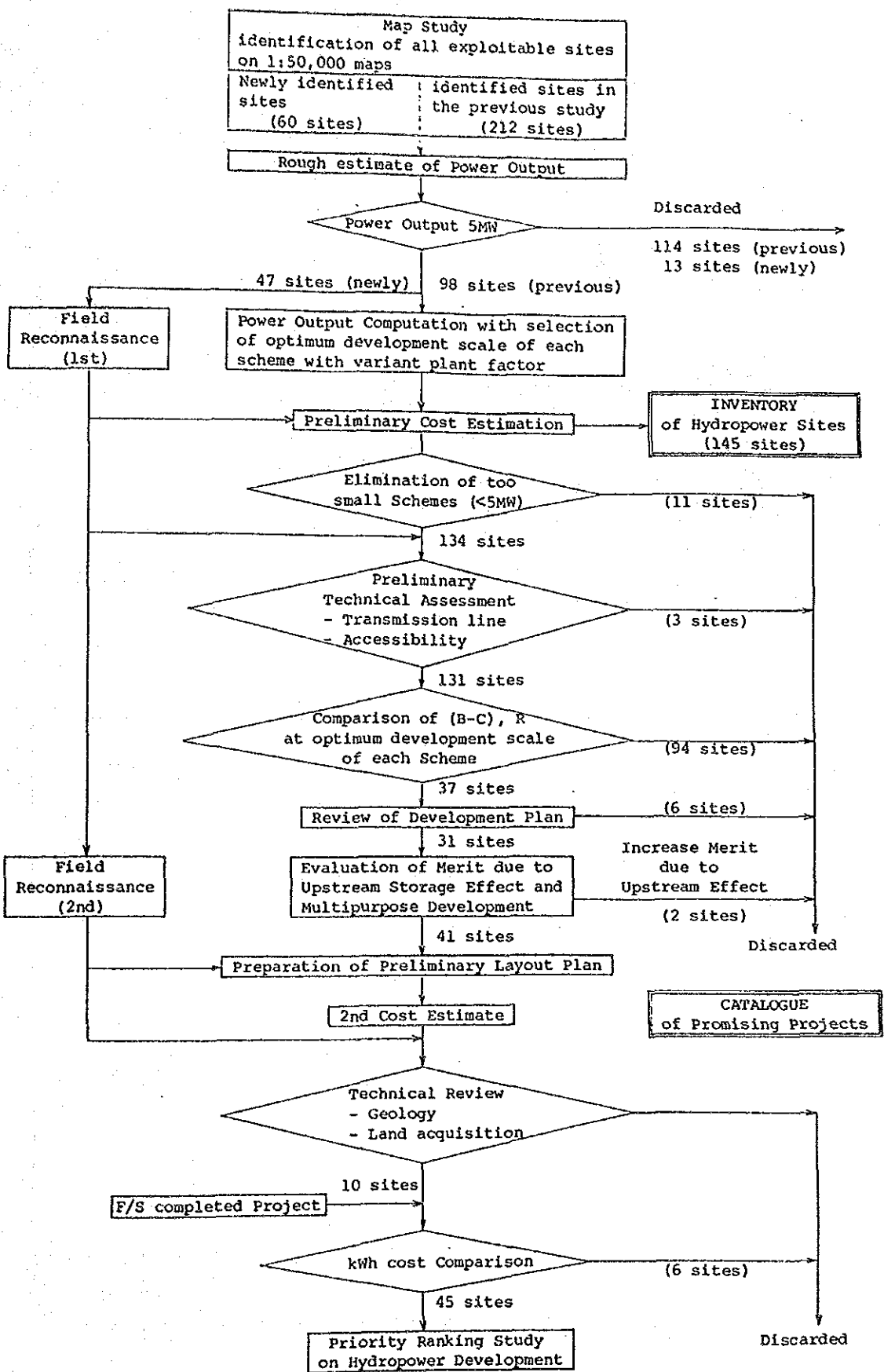


図 13.1 スクリーニング作業の流れ図

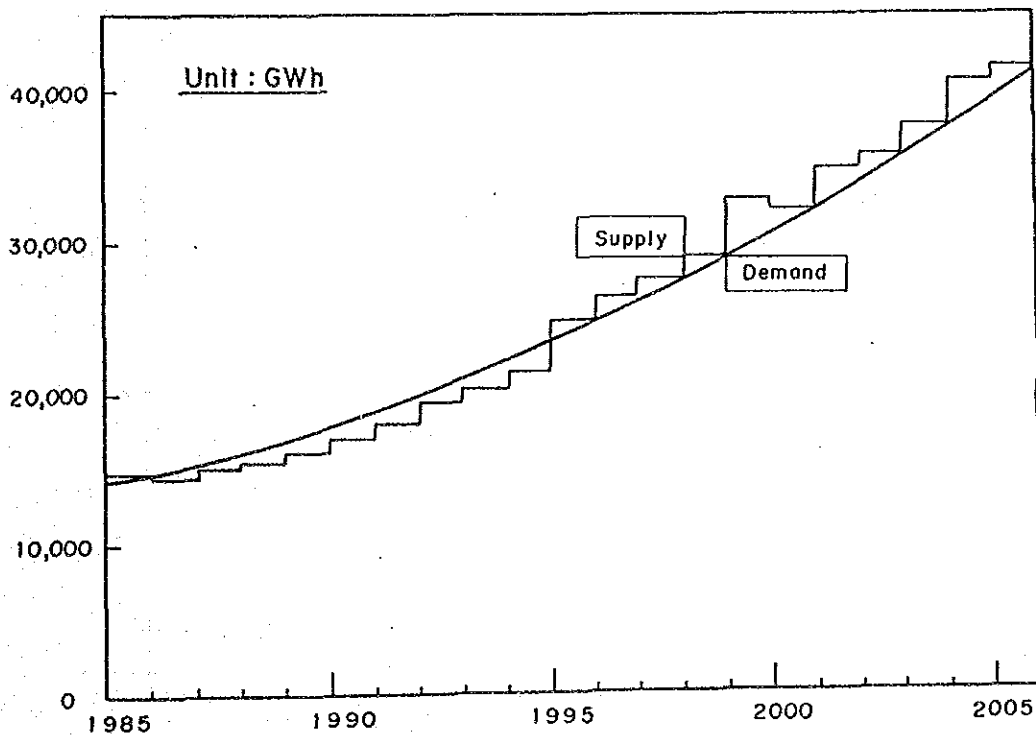
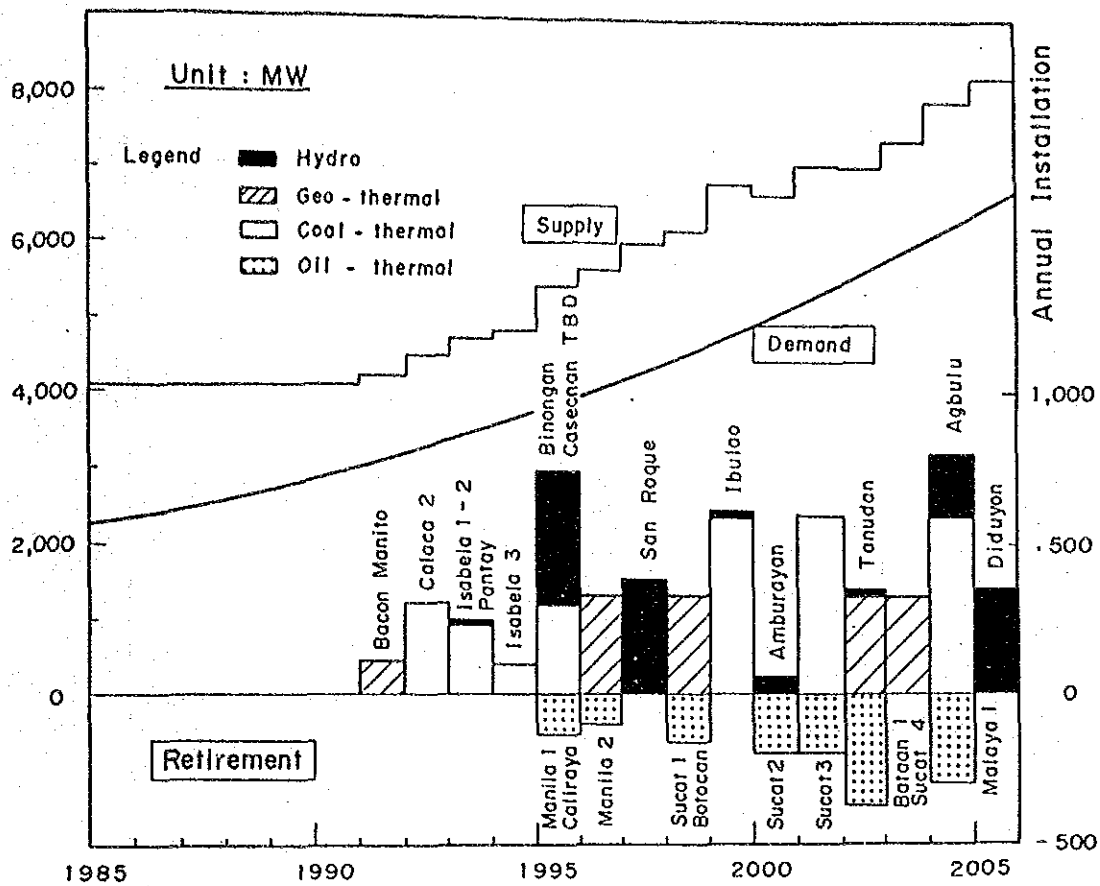


図 14.1 尖頭出力とエネルギーのバランス (1/8)
(ケース A, 最適案)

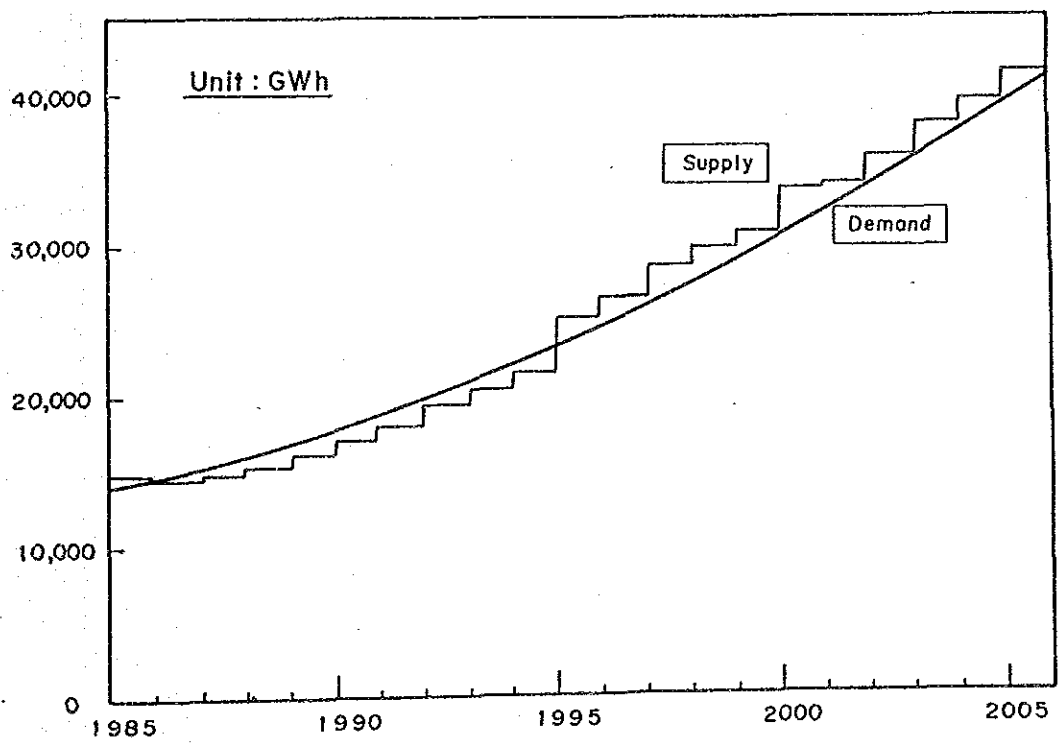
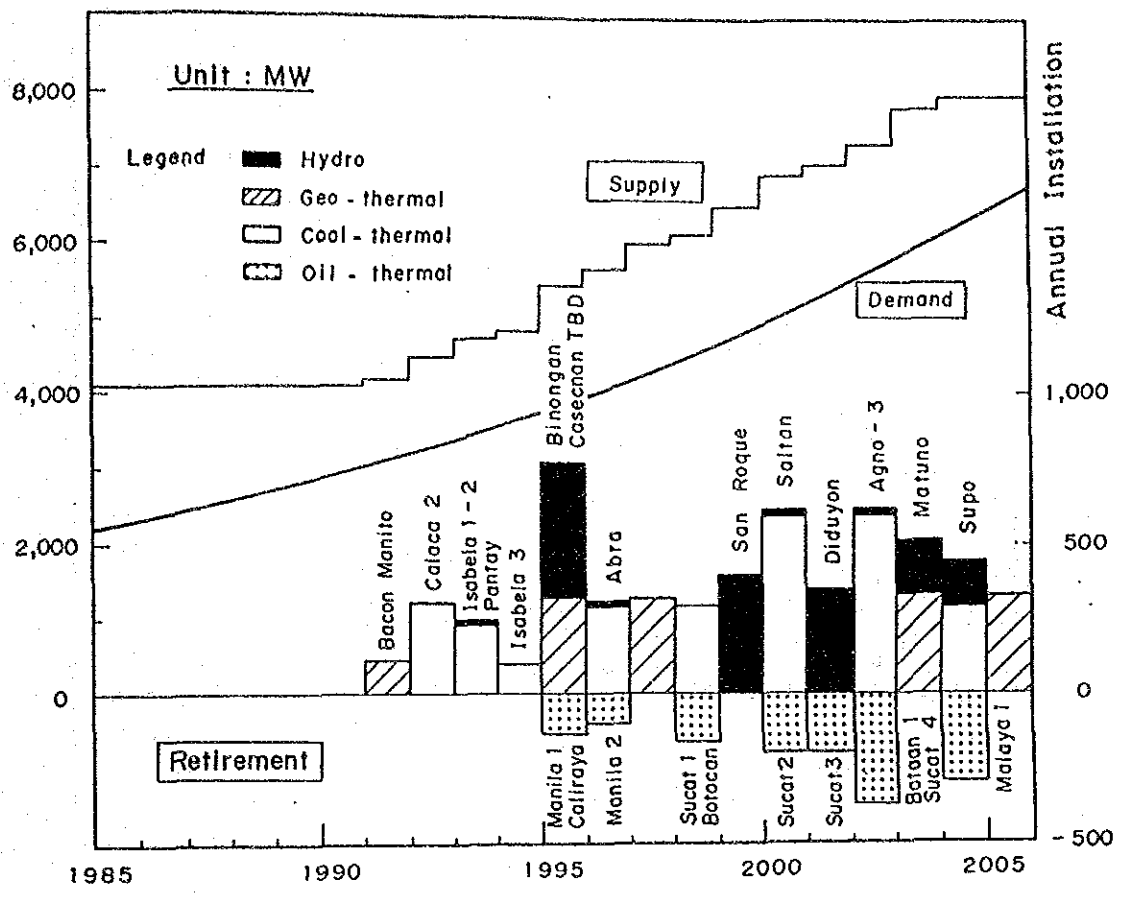


図 14.1 尖頭出力とエネルギーのバランス (2/8)
(ケース A, 第二案)

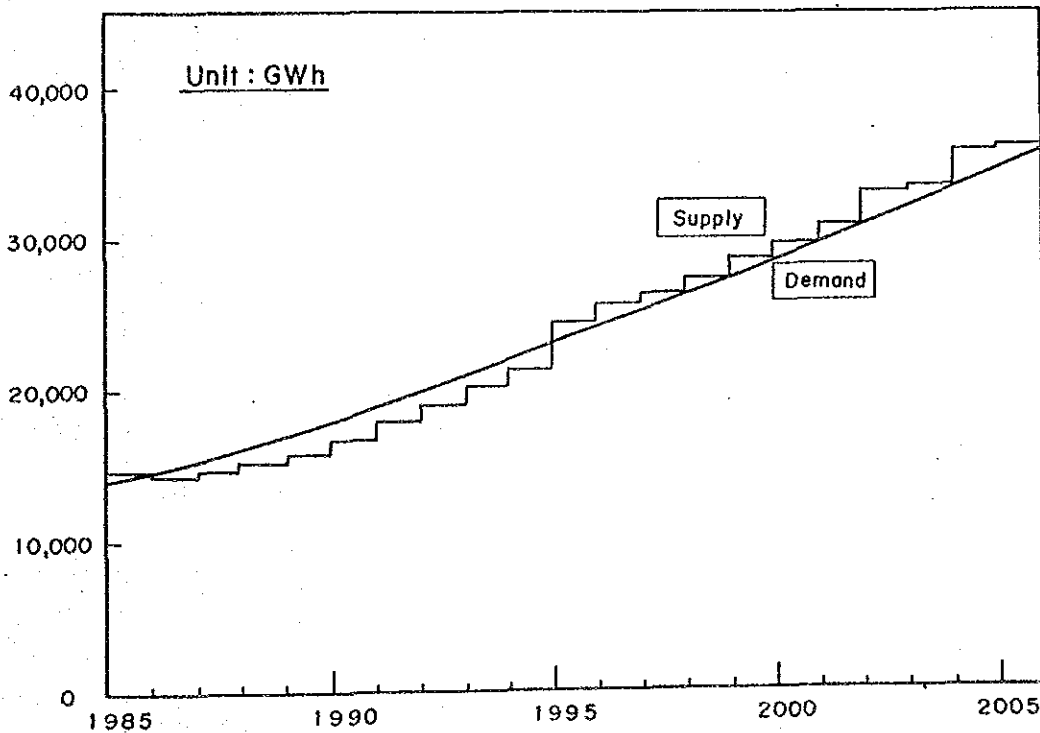
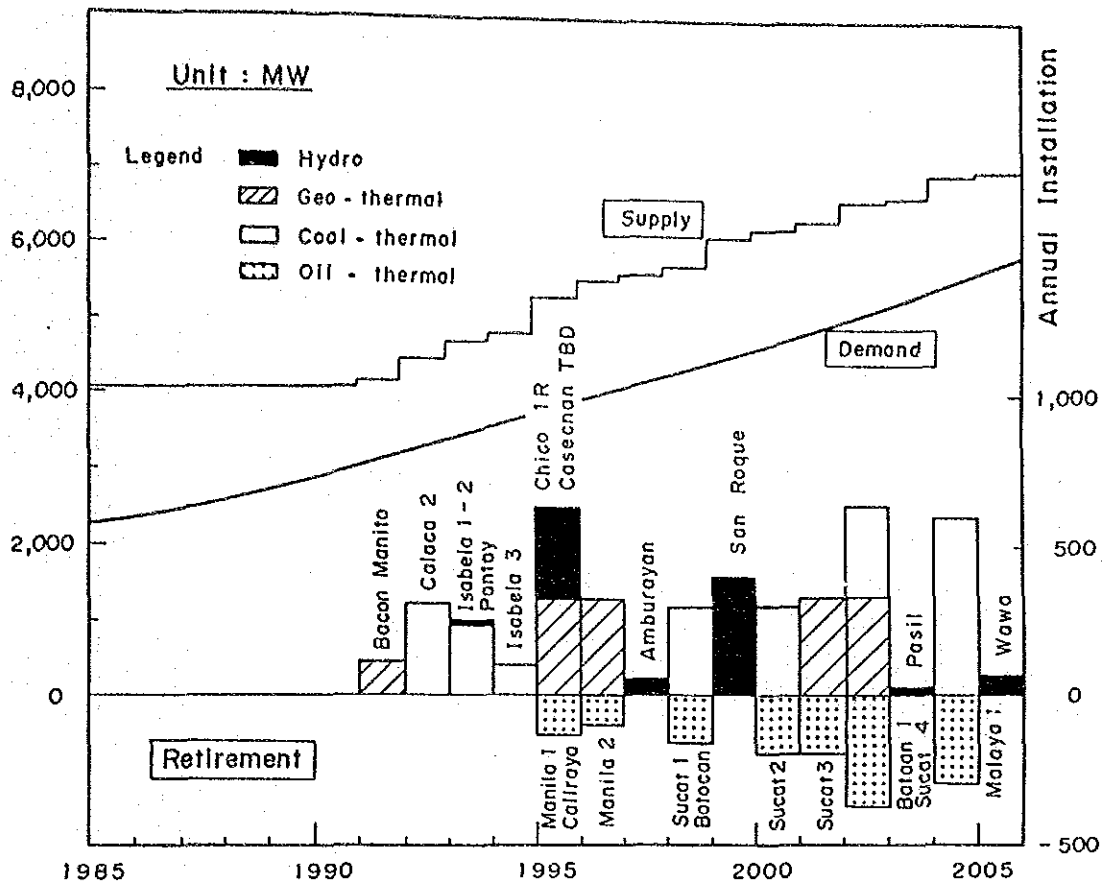


図 14.1 尖頭出力とエネルギーのバランス (3/8)
(ケース B, 最適案)

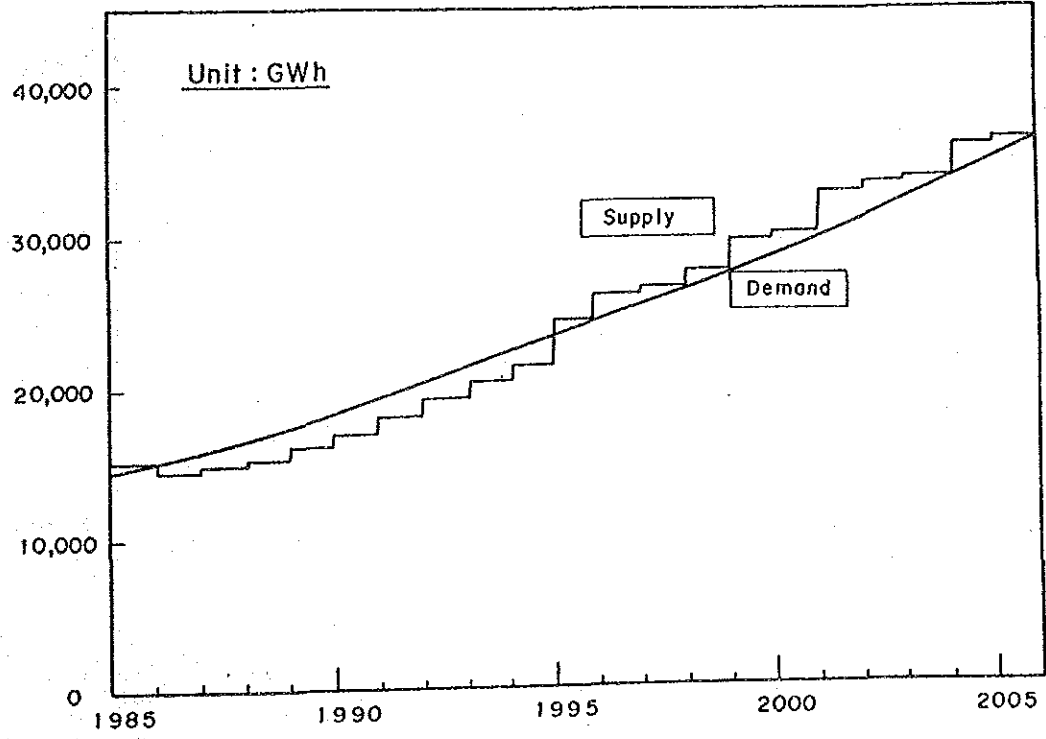
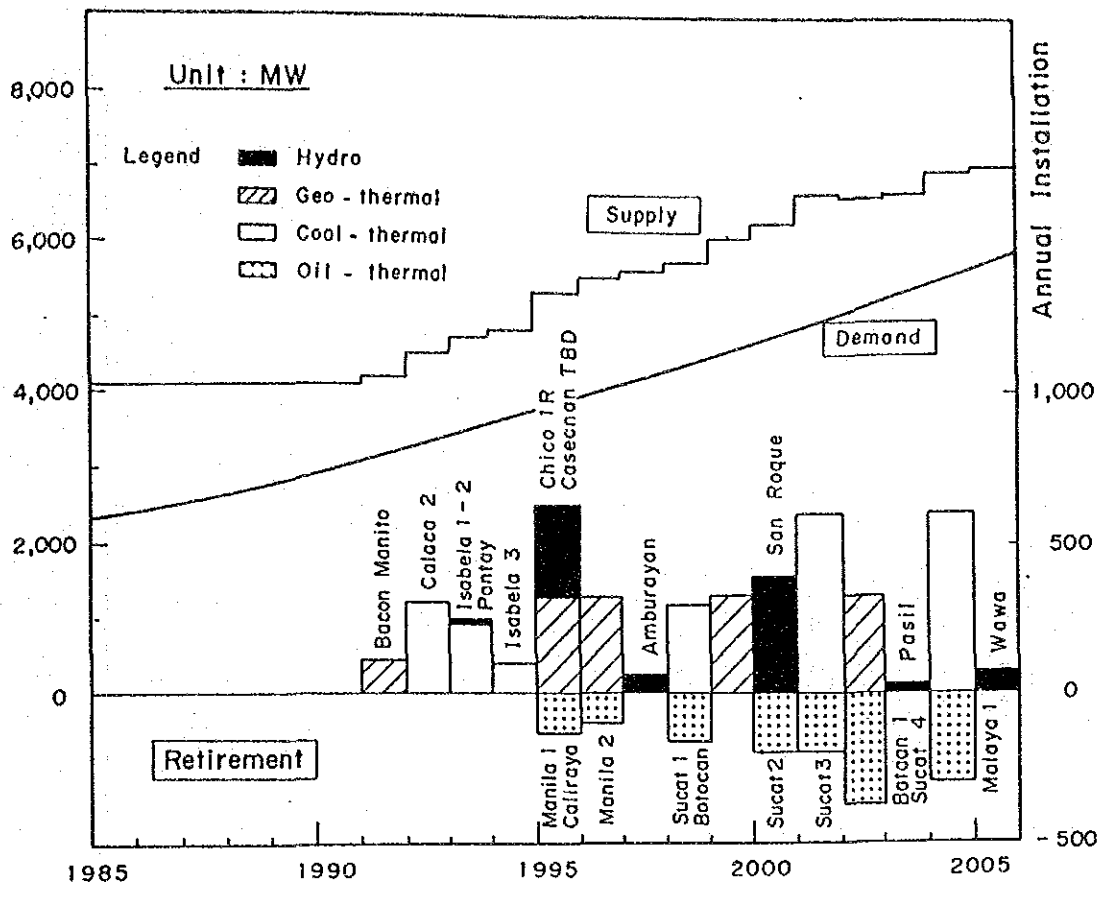


図 14.1 尖頭出力とエネルギーのバランス (4/8)
(ケースB, 第二案)

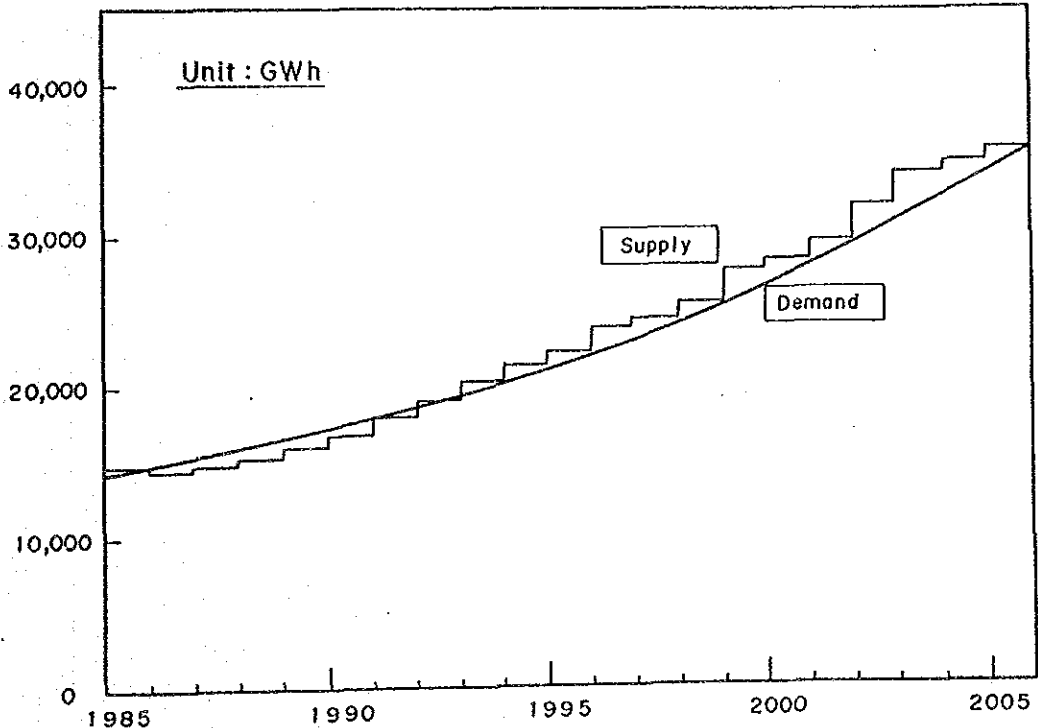
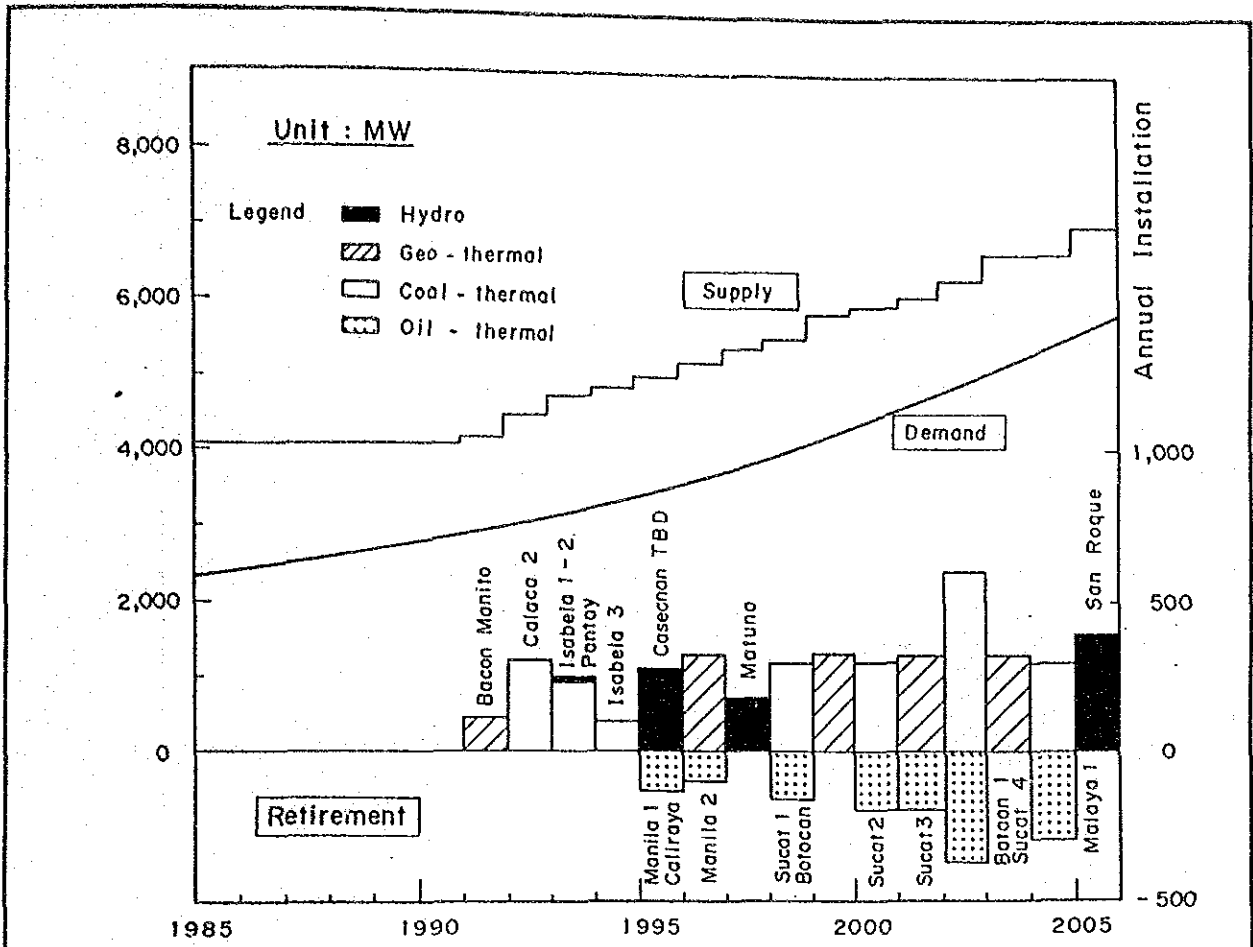


図 14.1 尖頭出力とエネルギーのバランス (5/8)
(ケースC, 最適案)

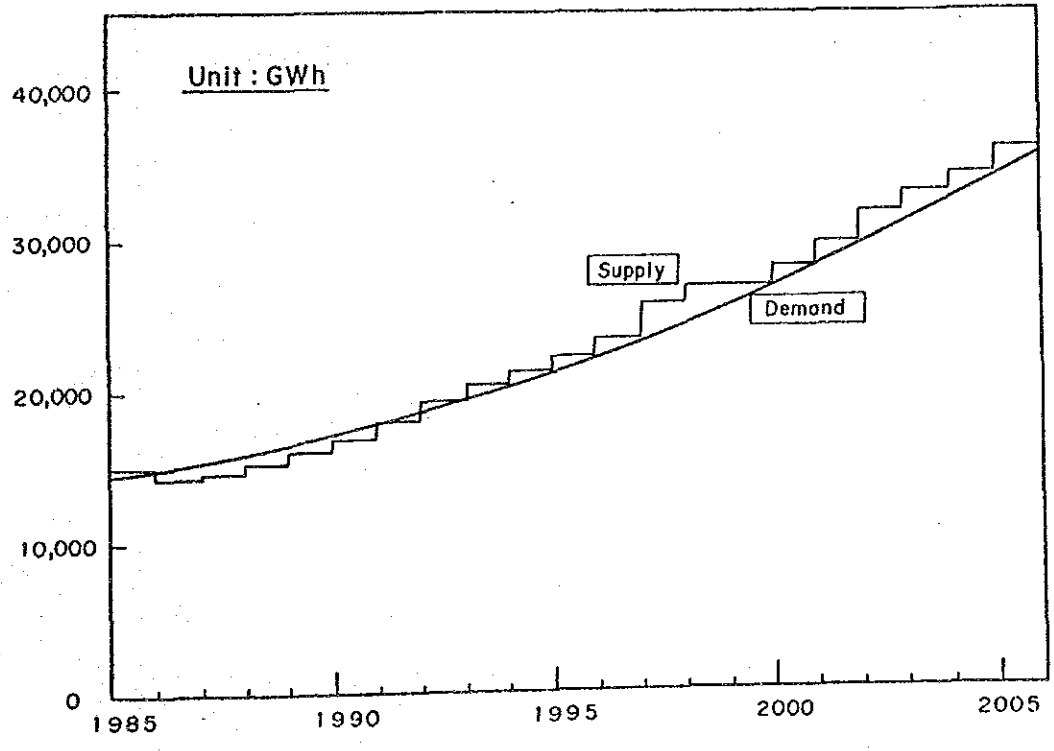
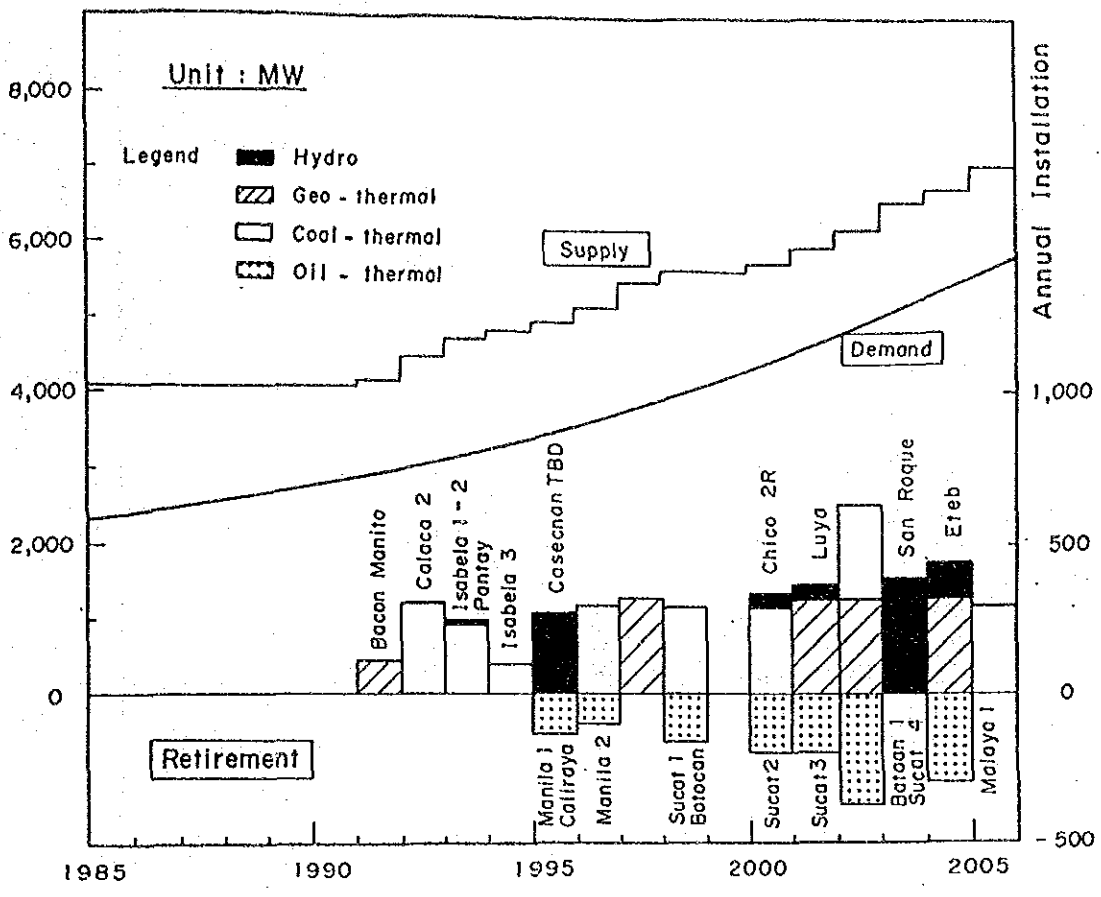


図 14.1 尖頭出力とエネルギーのバランス (6/8)
(ケース C, 第二案)

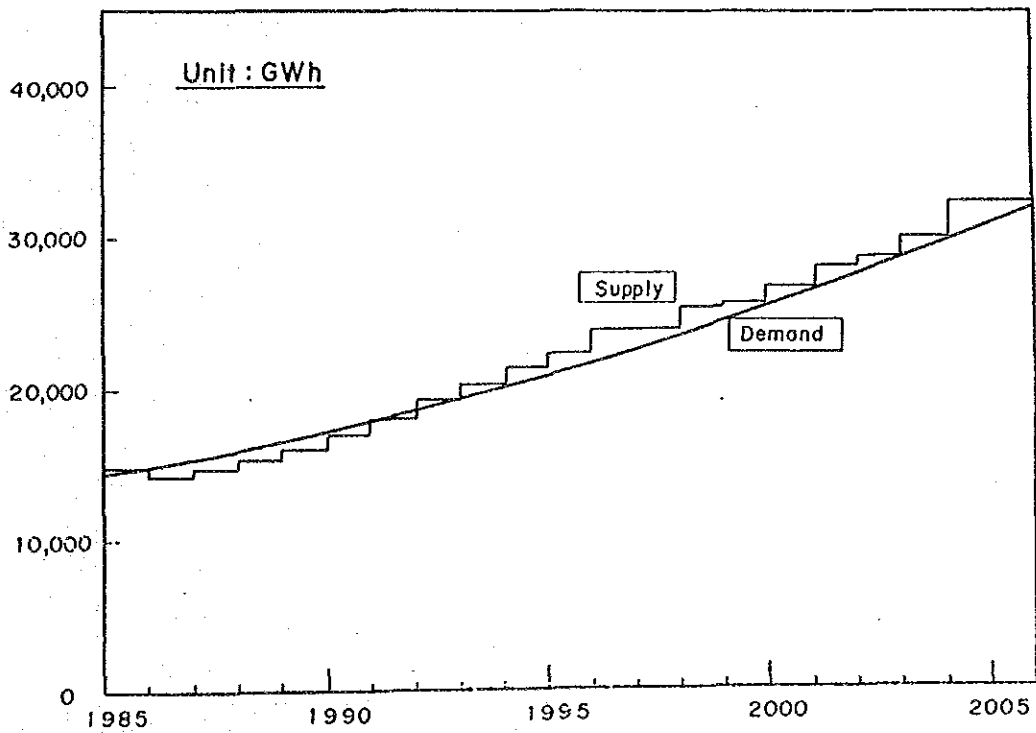
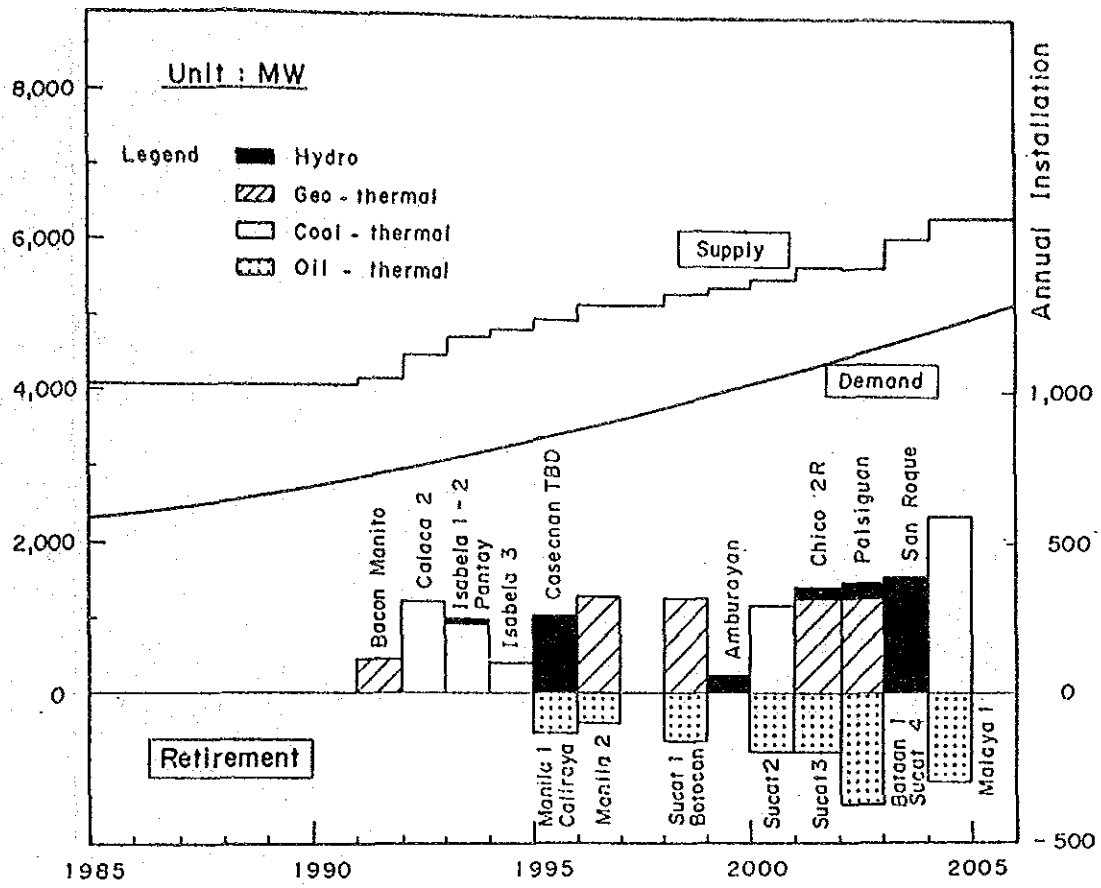


図 14.1 尖頭出力とエネルギーのバランス (7/8)
(ケース D, 最適案)

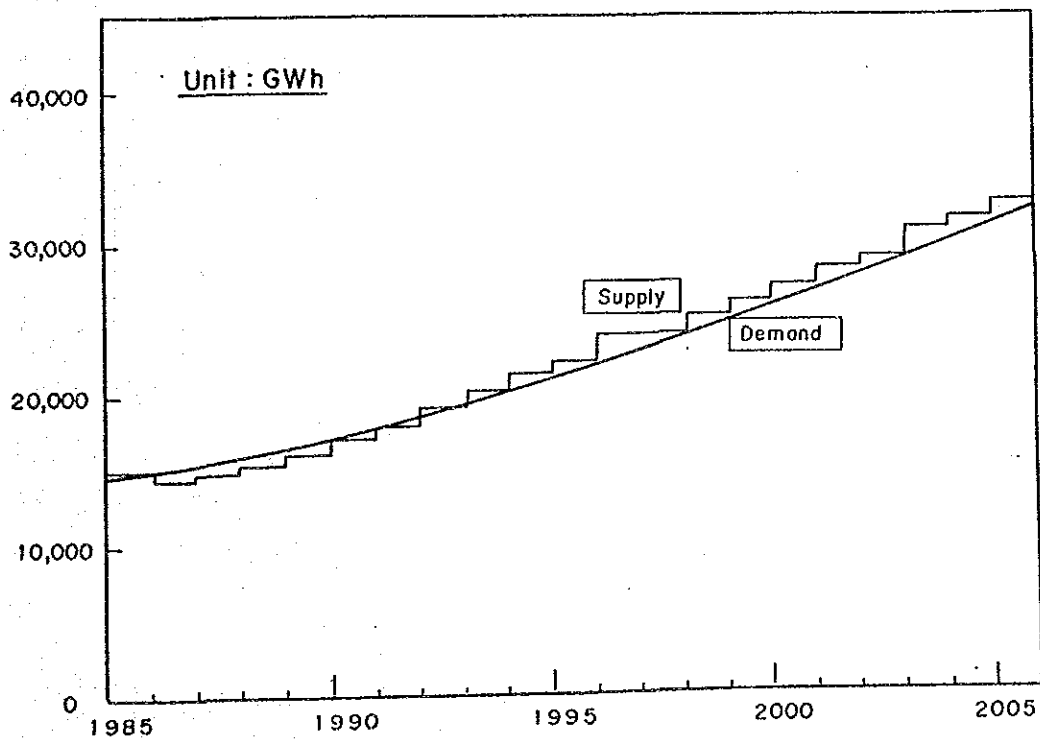
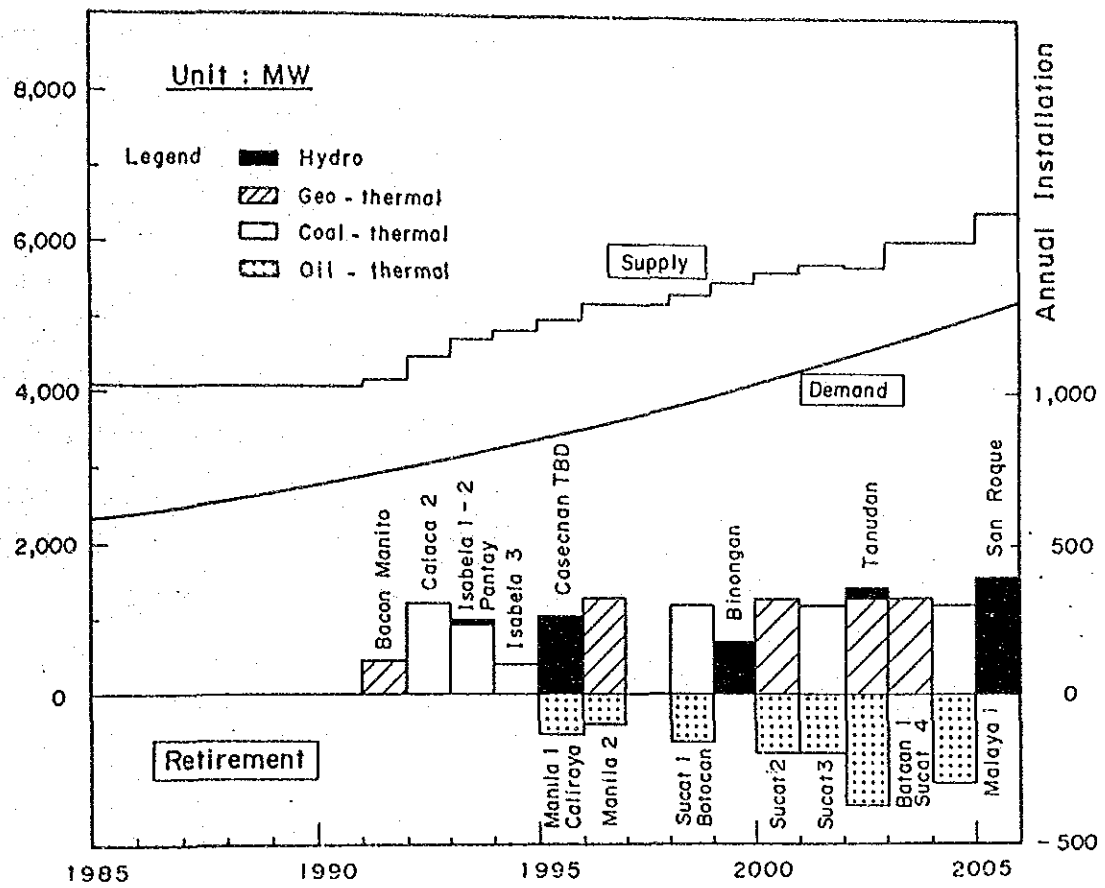
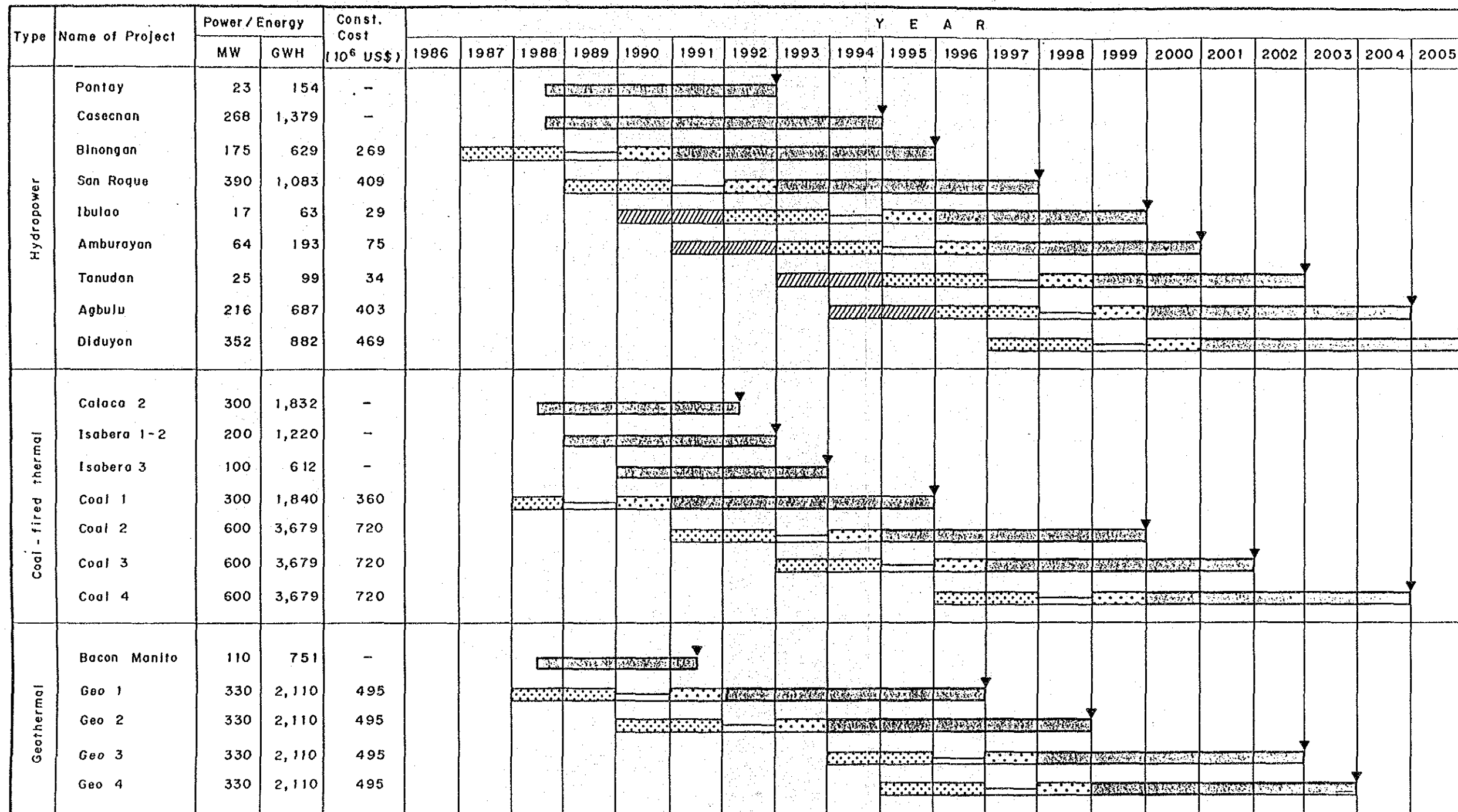


図 14.1 尖頭出力とエネルギーのバランス (8/8)
(ケースD, 第二案)






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LEGEND

-  : Feasibility Study
-  : Detailed Design
-  : Finance
-  : Tender / Contract
-  : Construction
- ▼ : Commissioning of Power Plant

Remarks:

1. Construction period and commissioning of the committed project are represented as scheduled in the Power Development Program by NPC (May 1986)
2. Construction cost of the committed project is not represented.

図 15.1 発電設備投入計画

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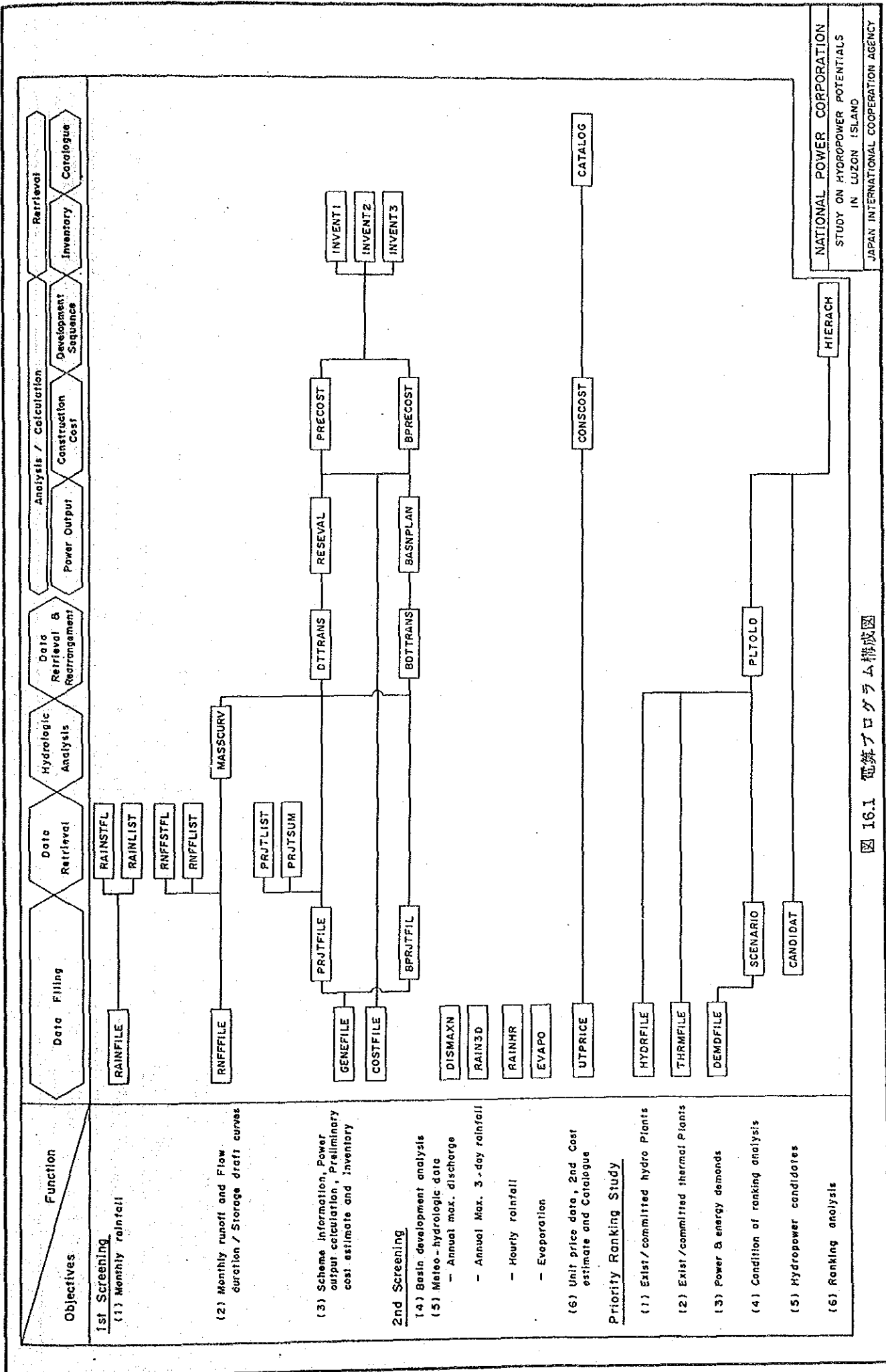
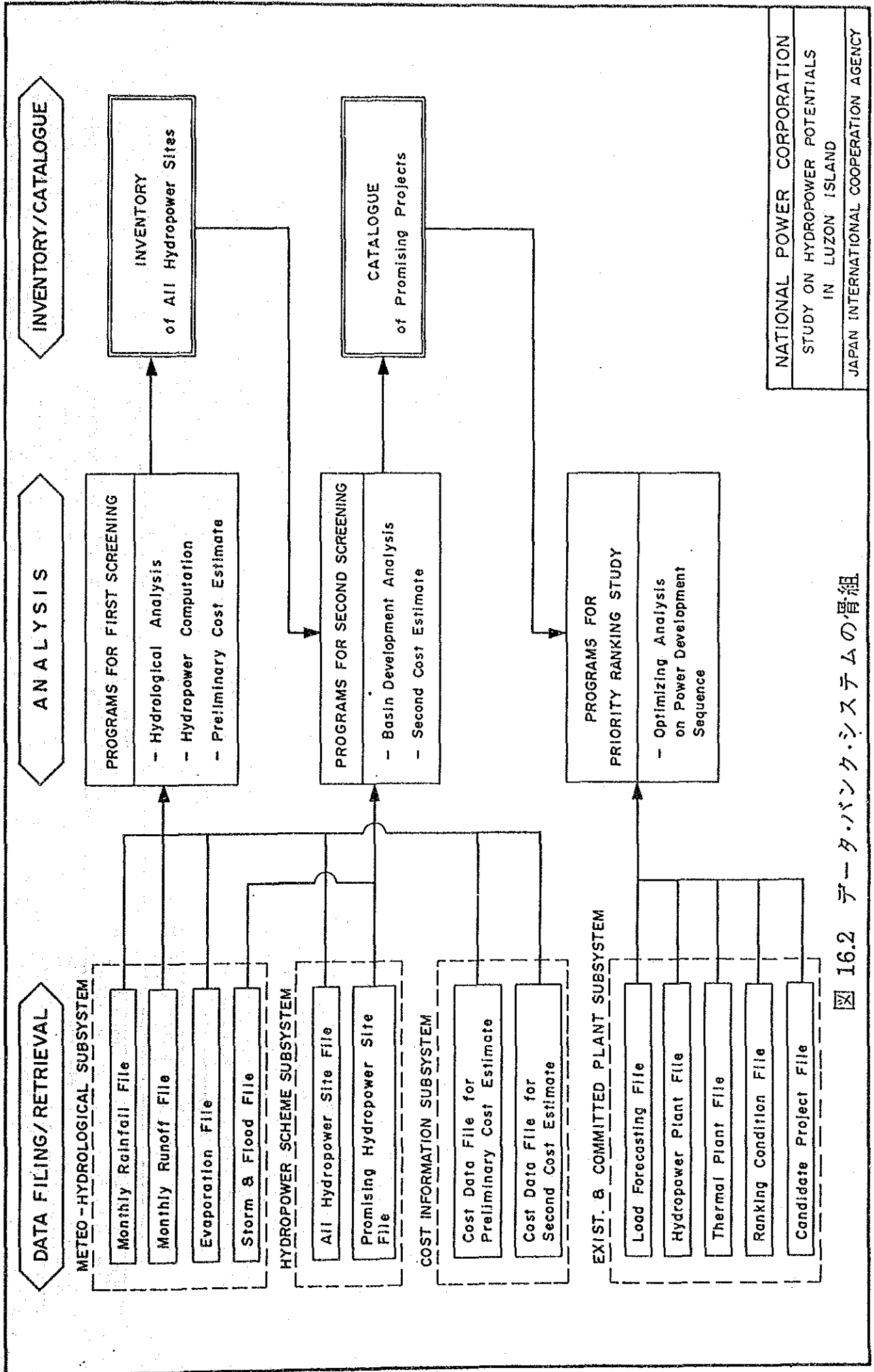


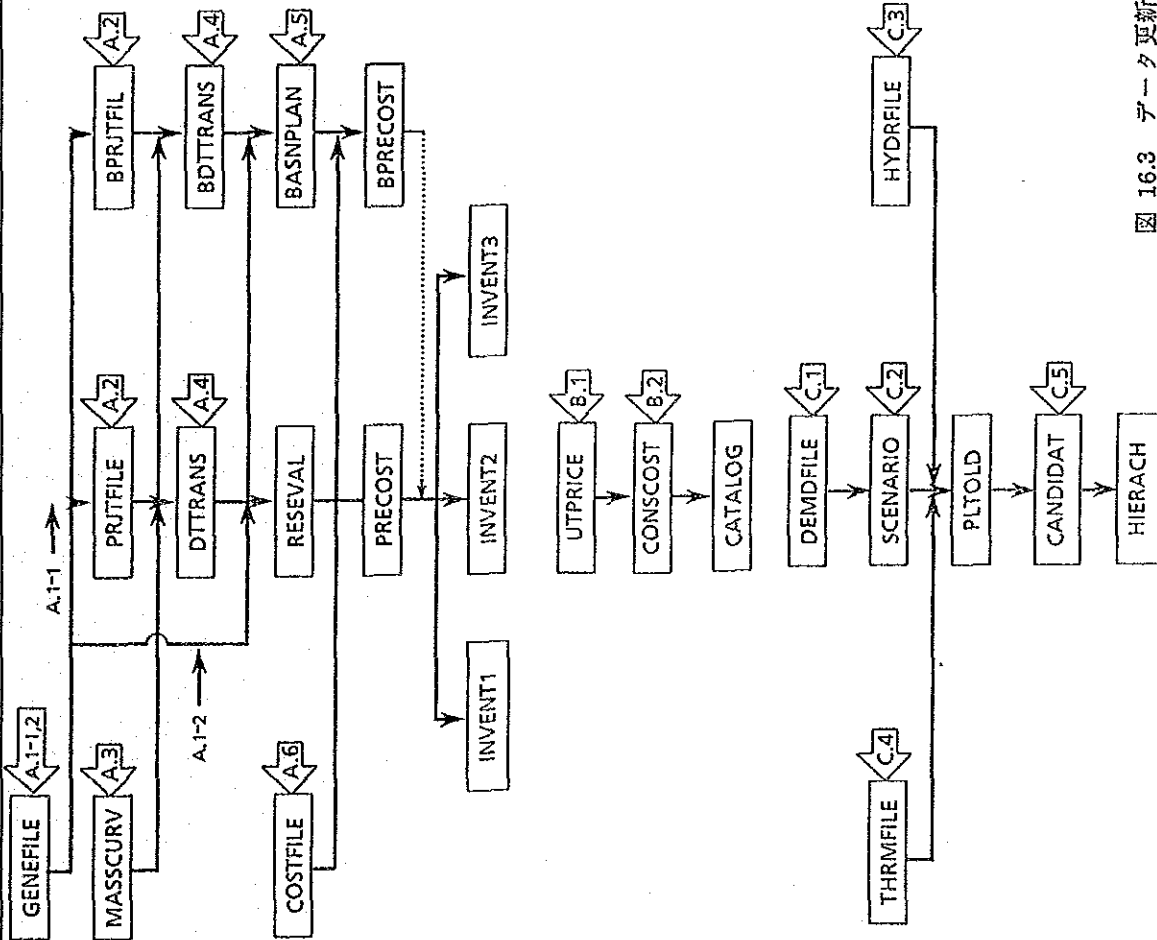
図 16.1 電算プログラム構成図



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図 16.2 データバンクシステムの骨組

PROGRAMS AND PROCESSING FLOW



| DATA TO BE UPDATED | |
|--------------------|---|
| D a t a | |
| A.1-1 | Dam excavation depth, Dam vol. multiplier, Free board |
| A.1-2 | General calculation condition, Flood data, etc. |
| A. 2 | Scheme information |
| A. 3 | Selected runoff gages, Monthly runoff data |
| A. 4 | Scheme 1D#, Condition of power output calculation |
| A. 5 | Combination of schemes for basin development |
| A. 6 | Cost formula, Unit price |
| B. 1 | Unit price |
| B. 2 | Feature of promising schemes |
| C. 1 | Power and energy demands |
| C. 2 | Condition of priority ranking study |
| C. 3 | Data on existing/committed hydropower plants |
| C. 4 | Data on existing/committed thermal plants |
| C. 5 | Data on candidate hydropower projects |

図 16.3 データ更新の手順

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