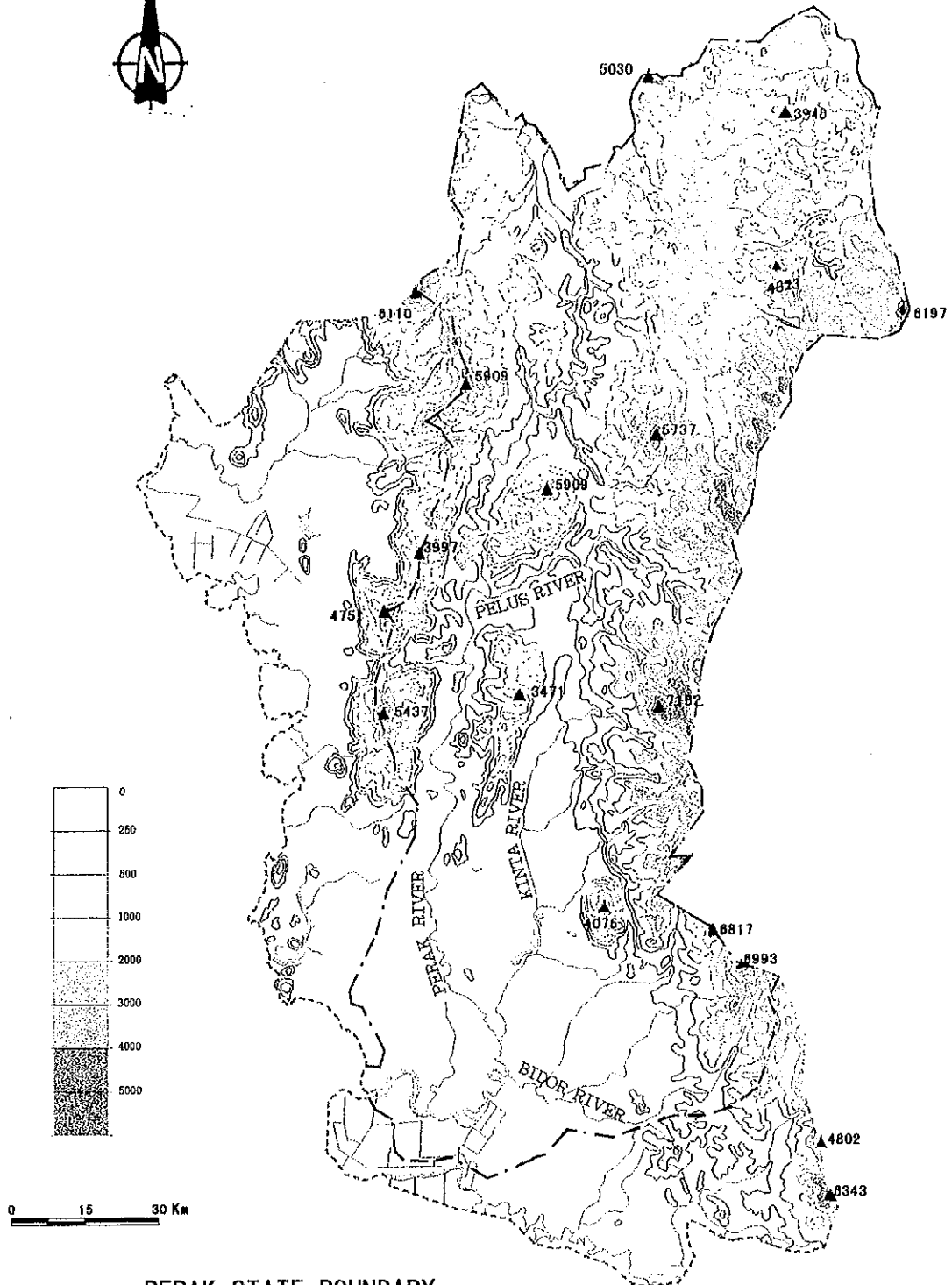


FIGURE



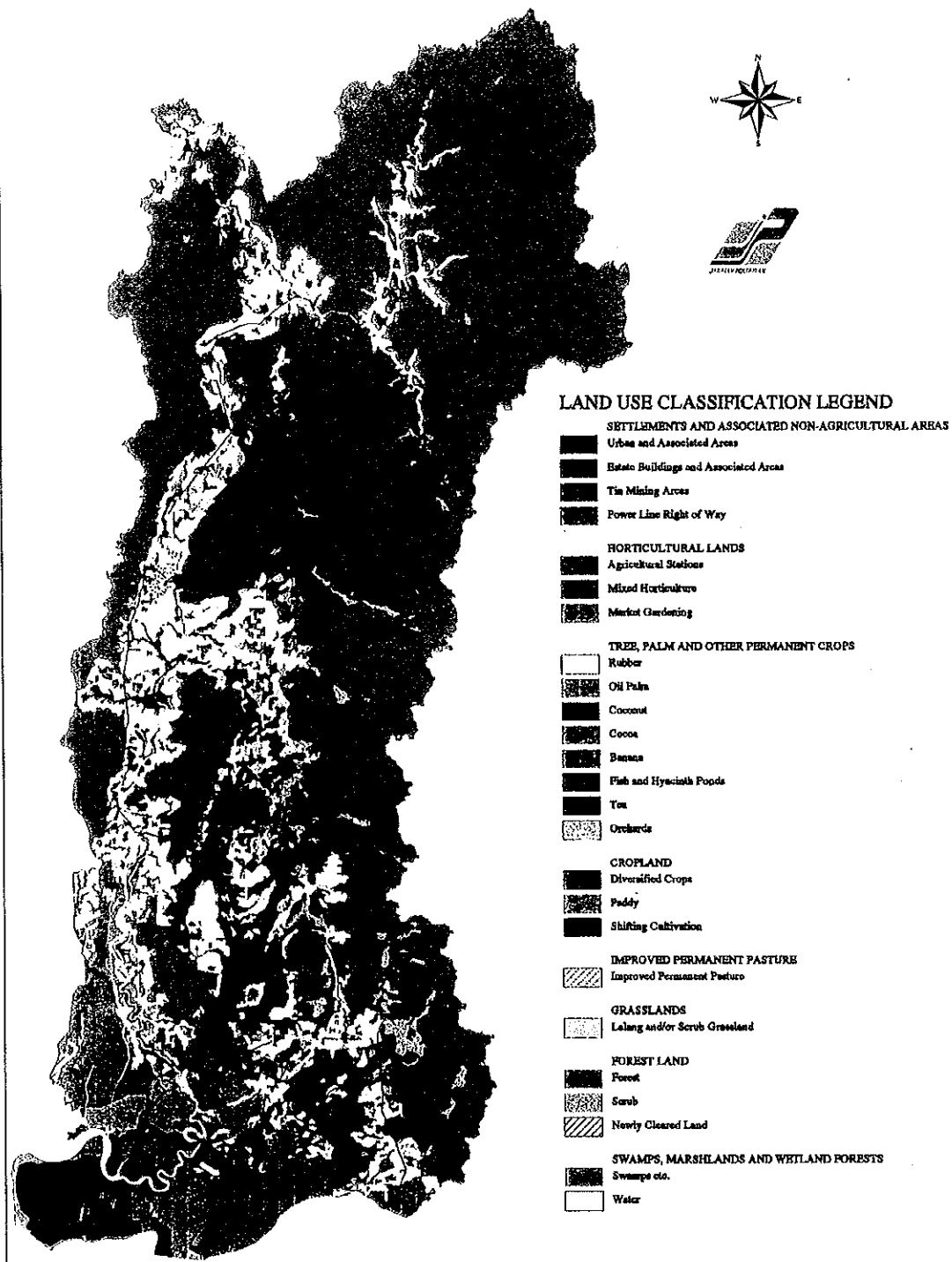
----- PERAK STATE BOUNDARY
- - - - - WATERSHED BOUNDARY
NOTE : ELEVATIONS IN FEET

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Fig. II-1 TOPOGRAPHIC MAP OF PERAK RIVER BASIN

LAND USE 1990 PERAK RIVER BASIN

Scale 1 : 700,000

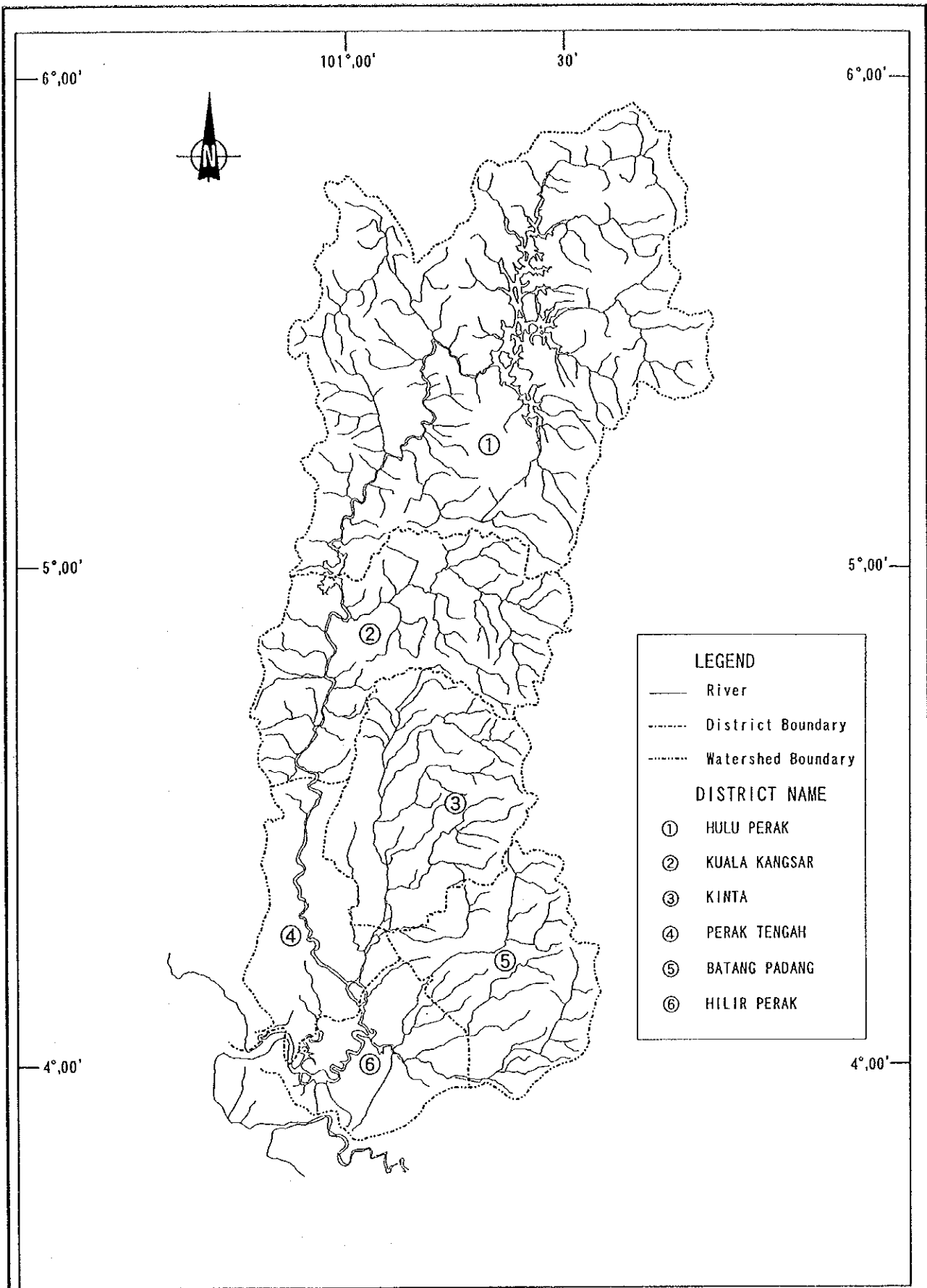


Prepared by G.I.S. Section on 5th June 1997

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Fig. II-2 PRESENT LAND USE OF PERAK
RIVER BASIN

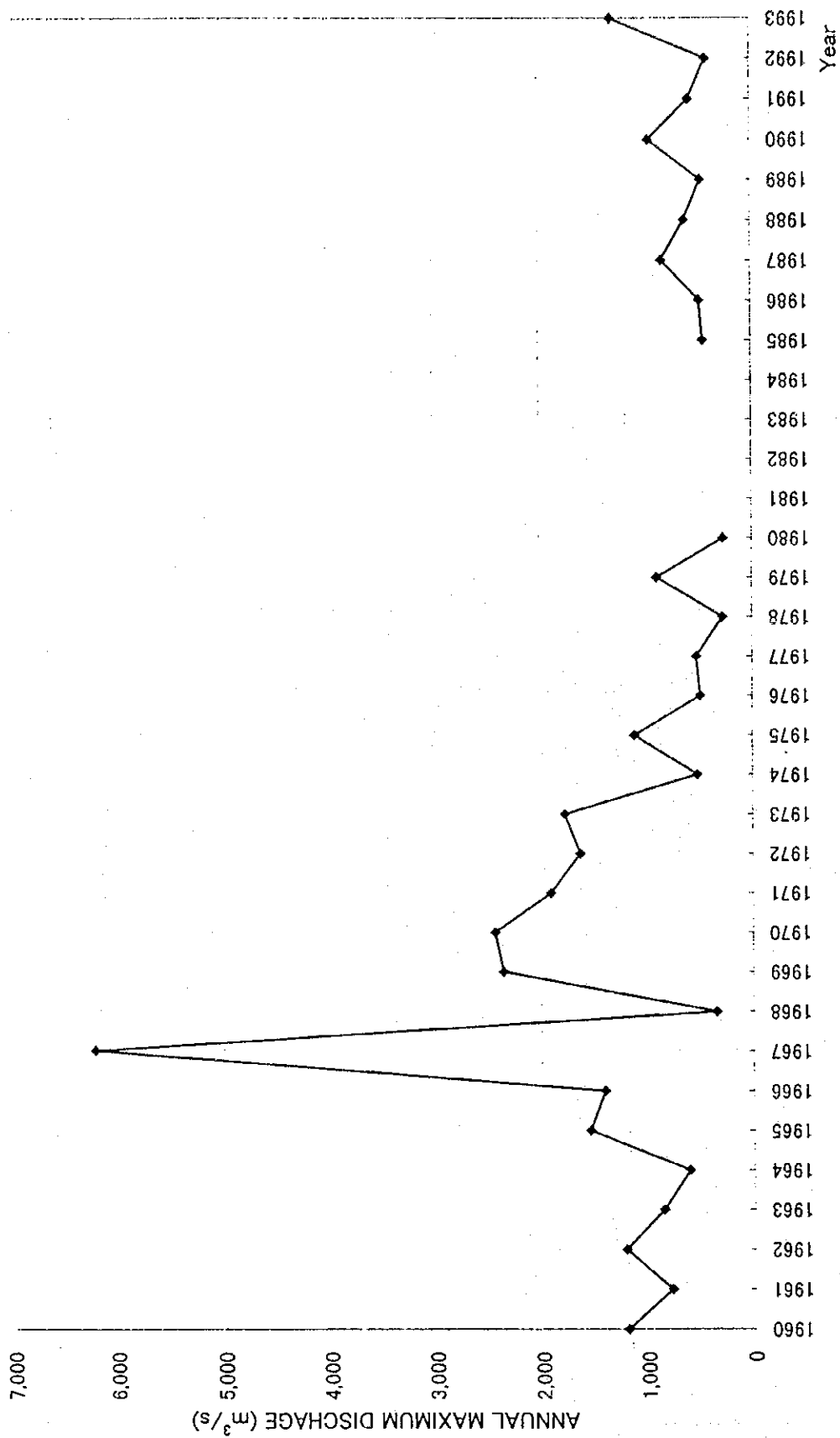
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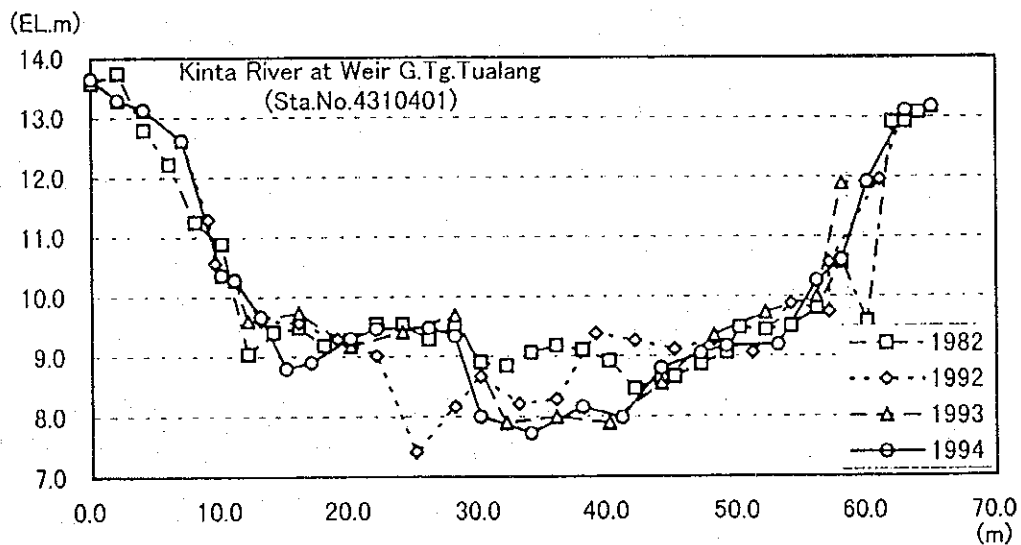
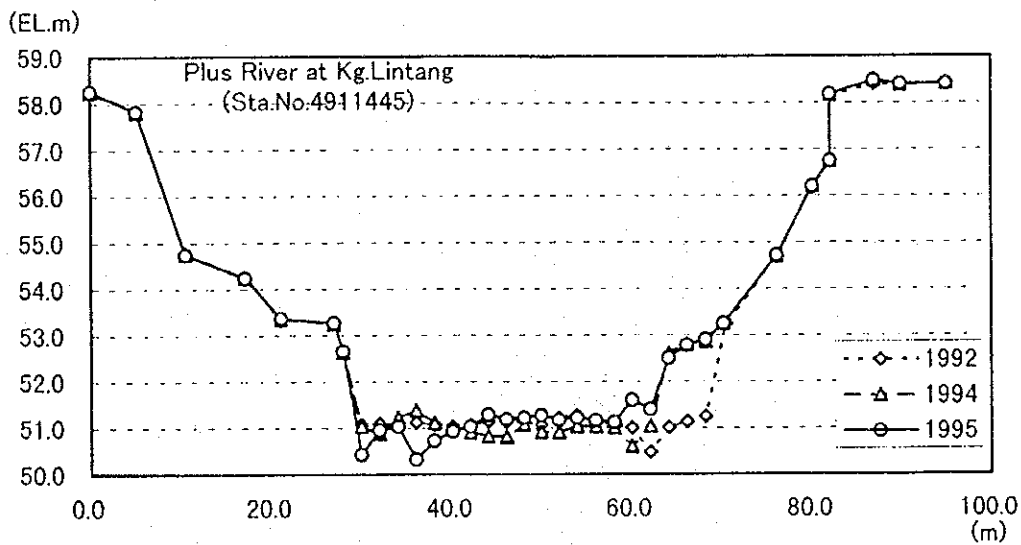
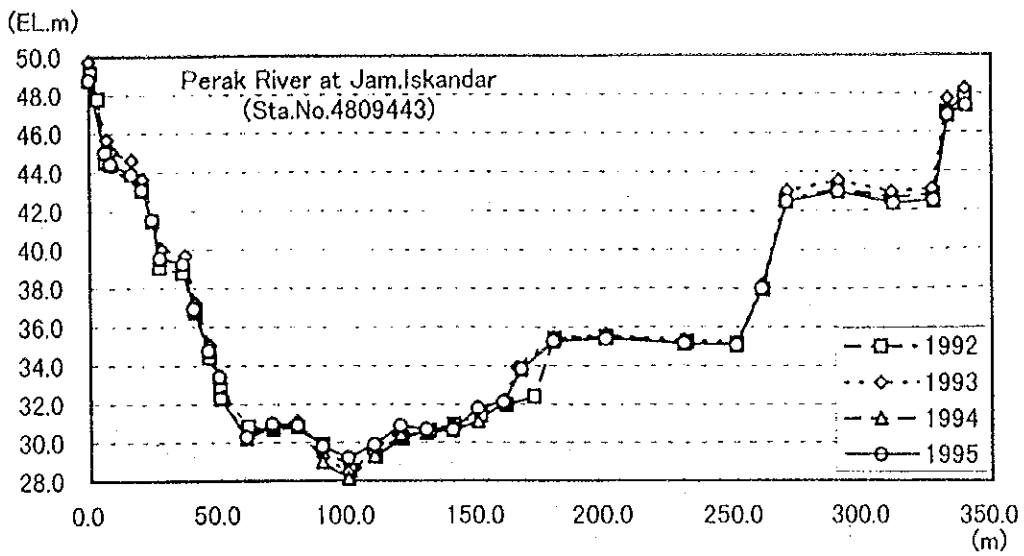
Fig. II-3 DISTRICT BOUNDARY IN PERAK
RIVER BASIN



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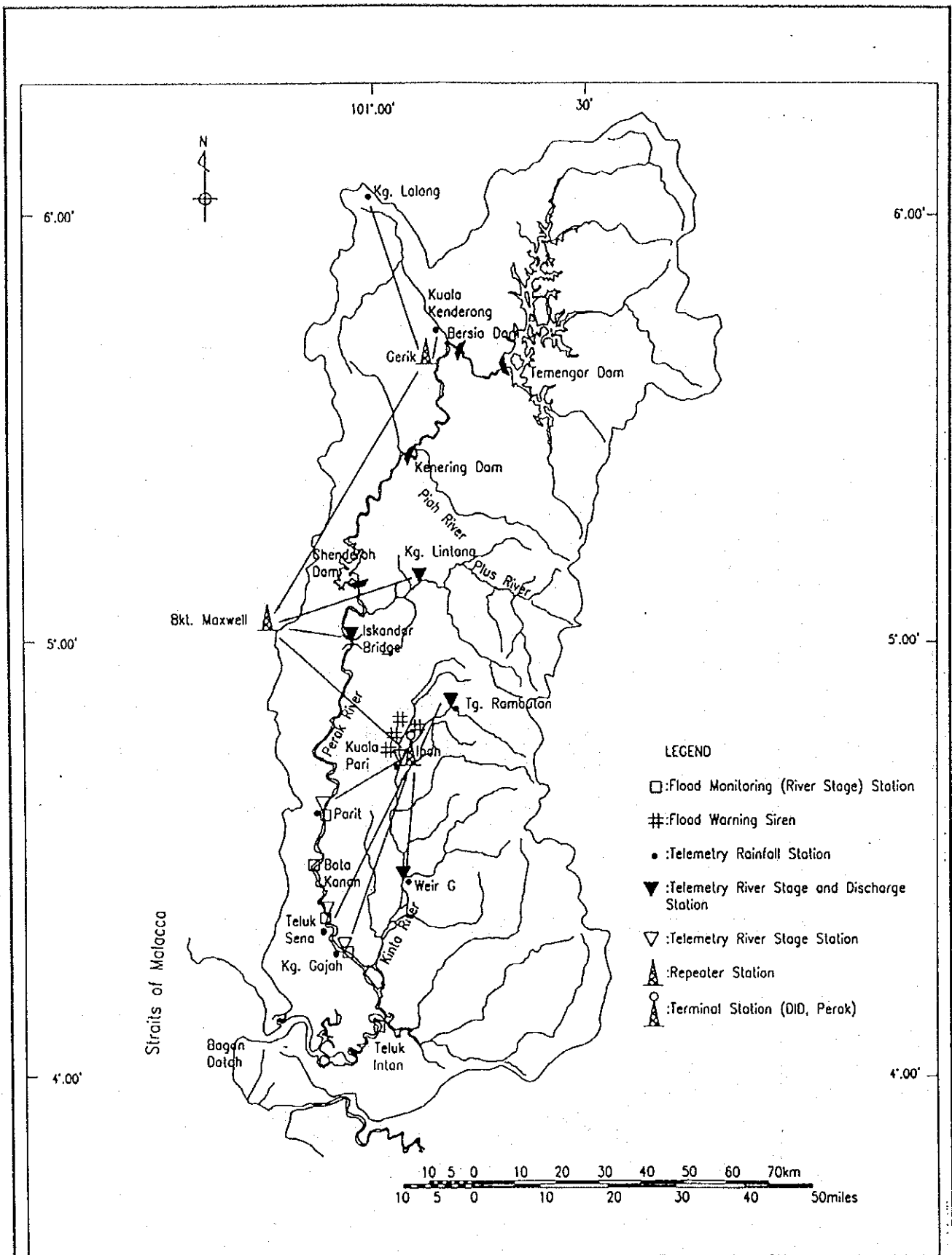
Fig. II-4 ANNUAL PEAK DISCHARGE AT
ISKANDAR BRIDGE



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JAPAN INTERNATIONAL COOPERATION AGENCY

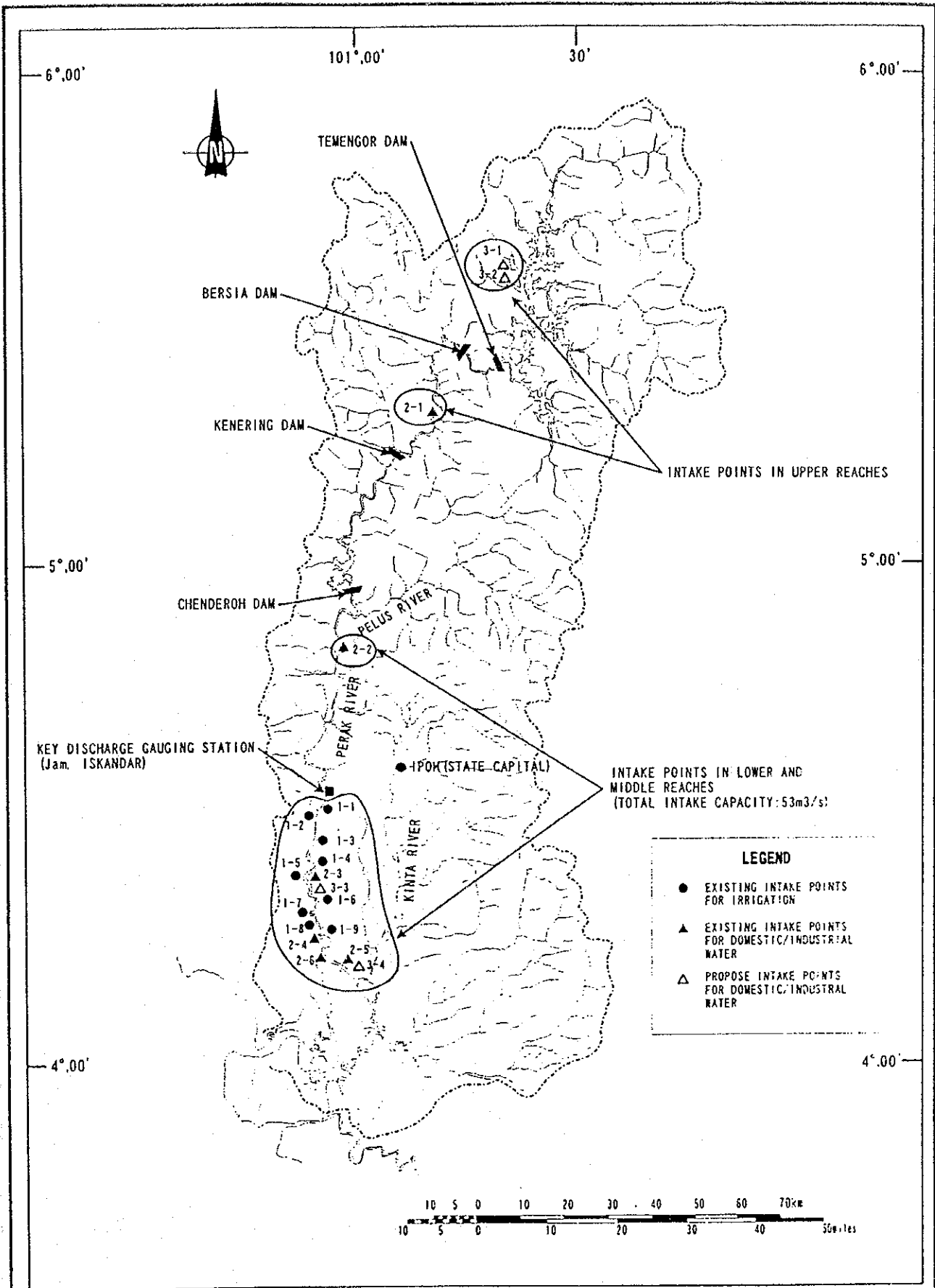
Fig. II-5 CROSS SECTIONS AT RIVER DIS-
CHARGE GAUGING POINT



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BASIN INFORMATION SYSTEM IN MALAYSIA

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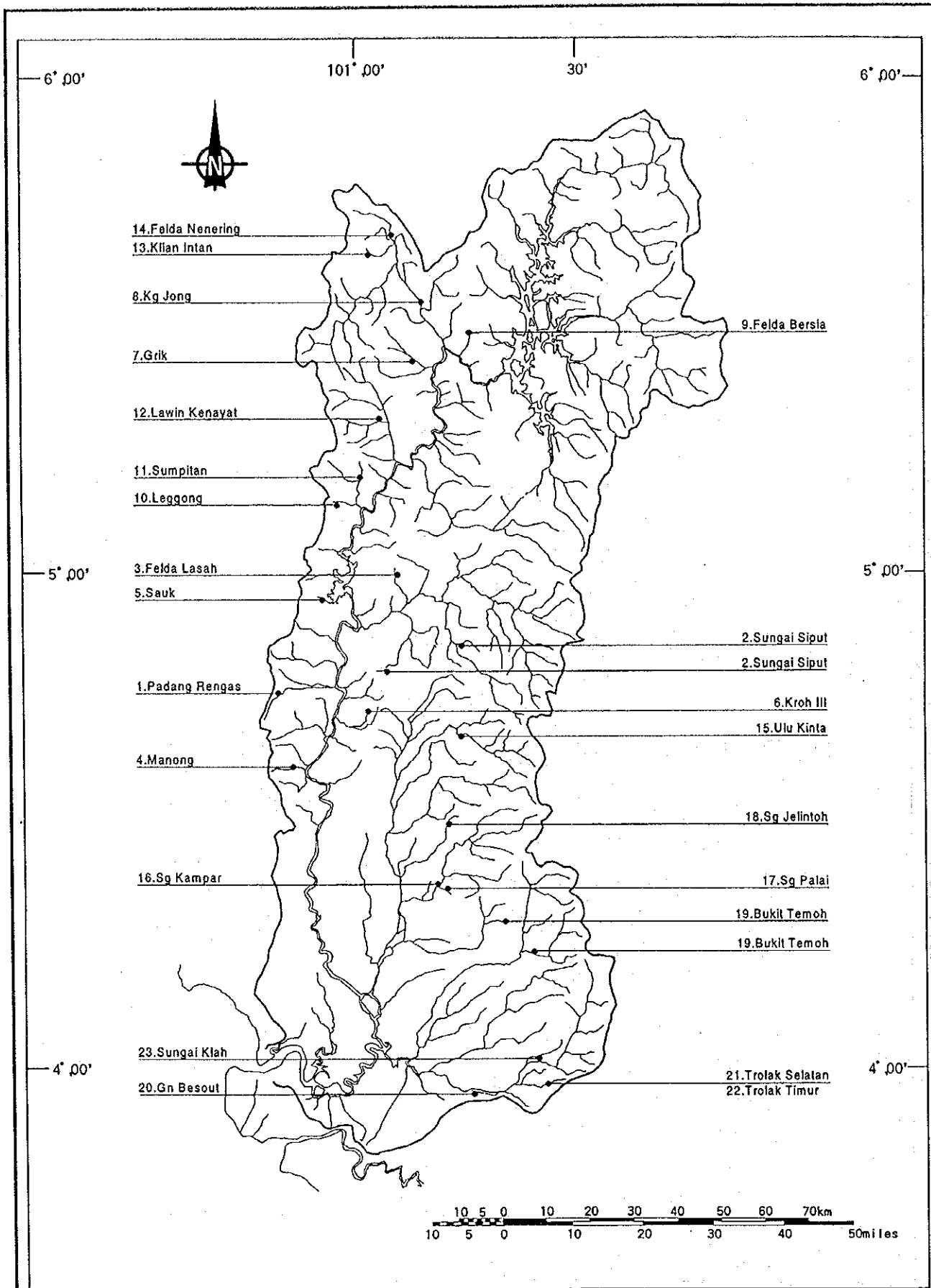
Fig. II-6 EXISTING FLOOD FORECASTING
AND WARNING SYSTEM IN PERAK
RIVER BASIN



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BASIN INFORMATION SYSTEM IN MALAYSIA

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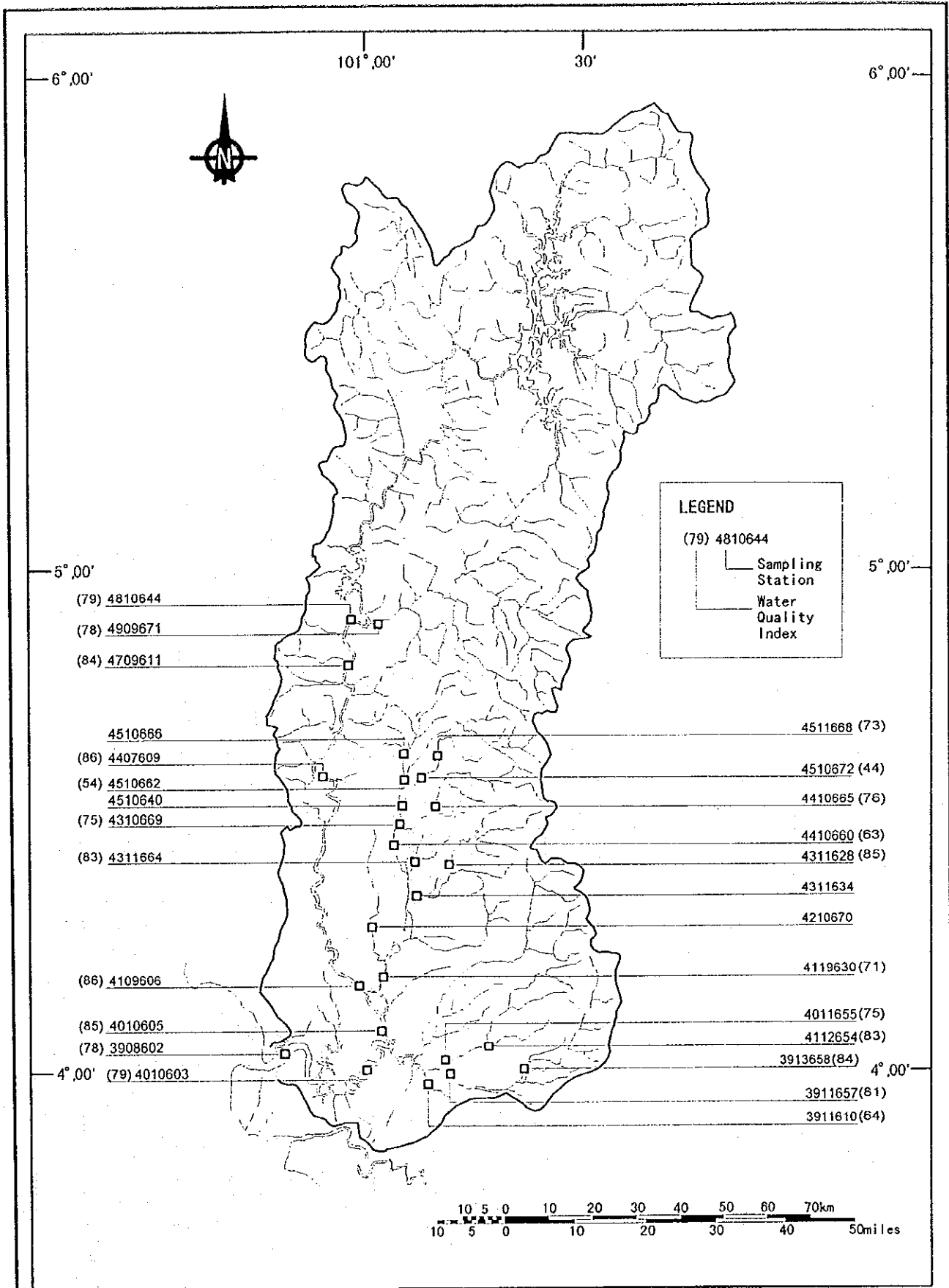
Fig. II-7 EXISTING WATER INTAKE POINTS
ALONG MAIN STREAM OF PERAK
RIVER



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Fig. II-8 EXISTING WATER INTAKE POINTS
ALONG TRIBUTARIES OF PERAK
RIVER



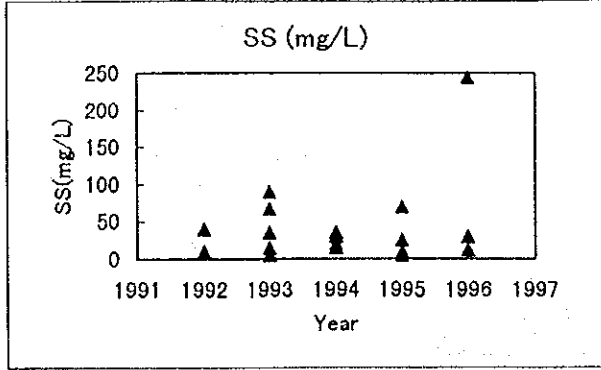
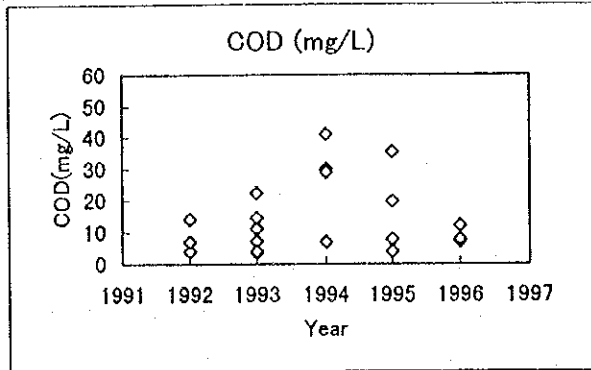
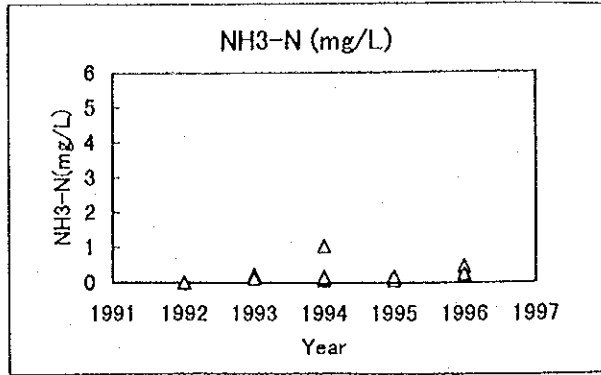
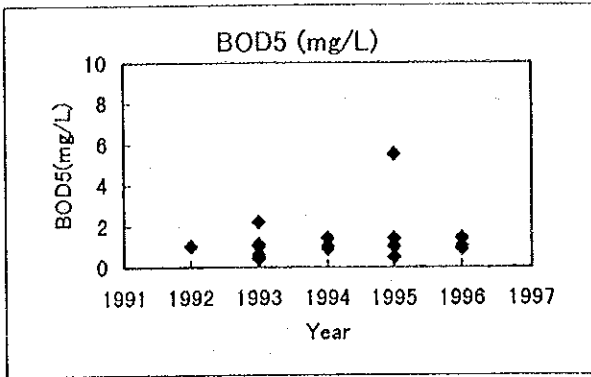
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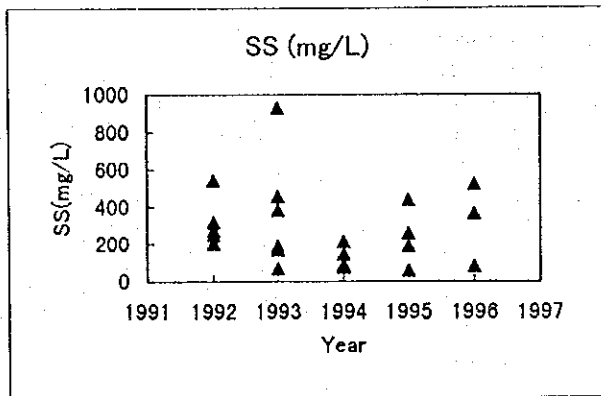
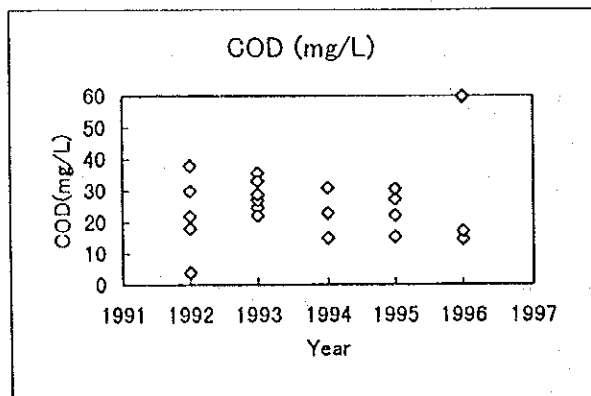
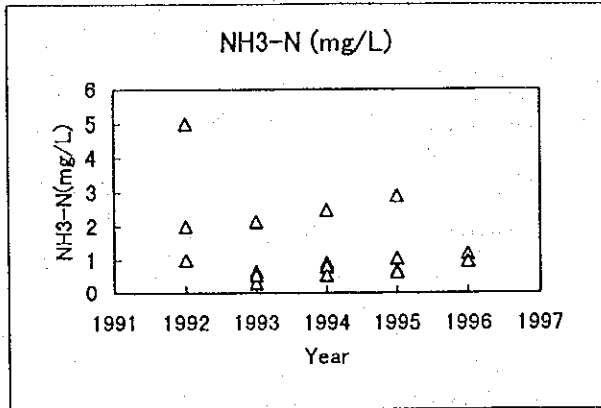
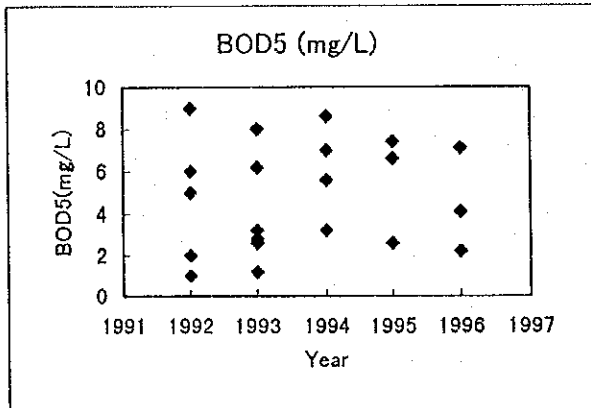
Fig. II-9

EXISTING DOE WATER SAMPLING
POINT AND WQI MONITORED AT
THE SAMPLING POINTS

RIVER NAME : SG.PERAK



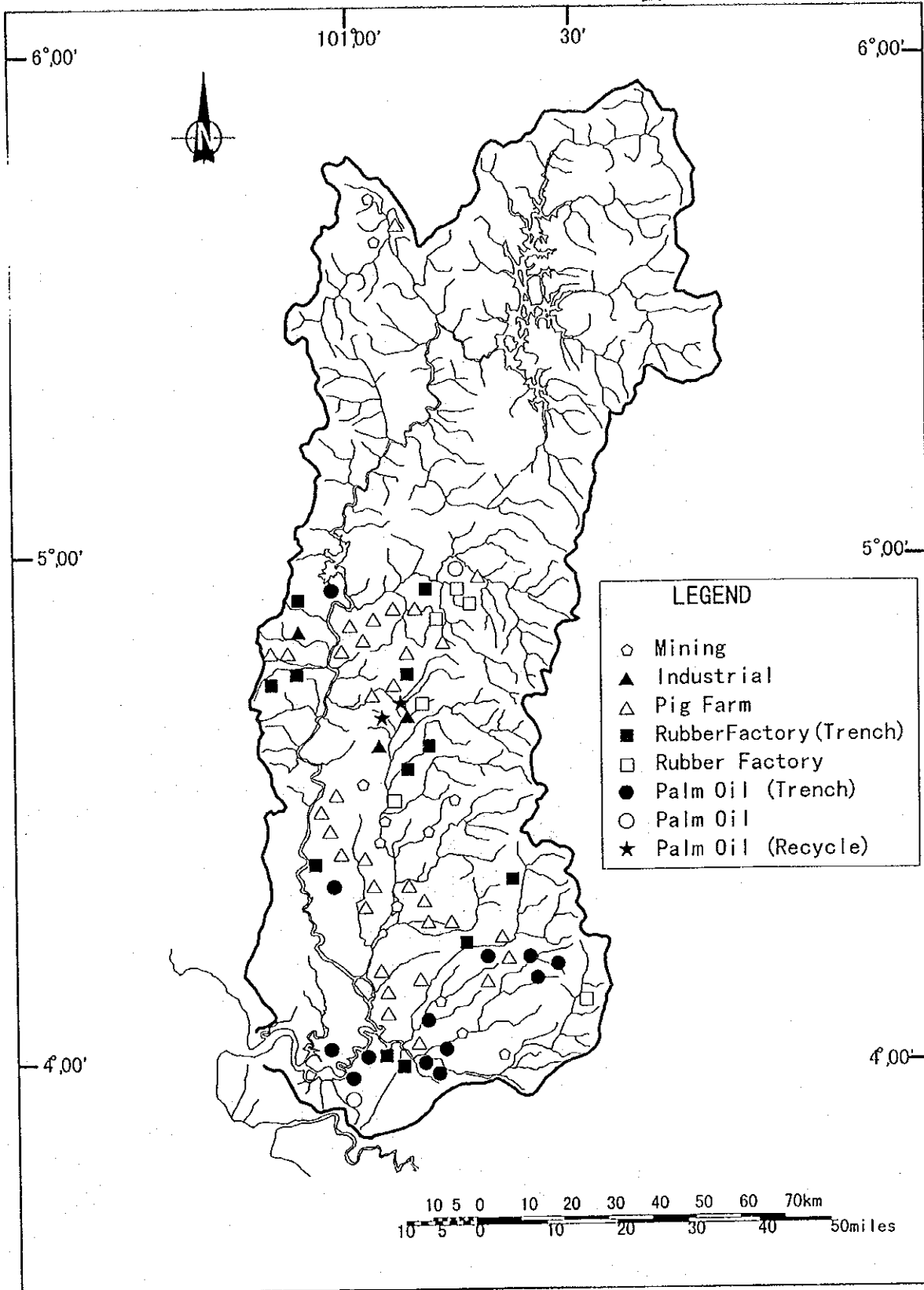
RIVER NAME : SG.KINTA



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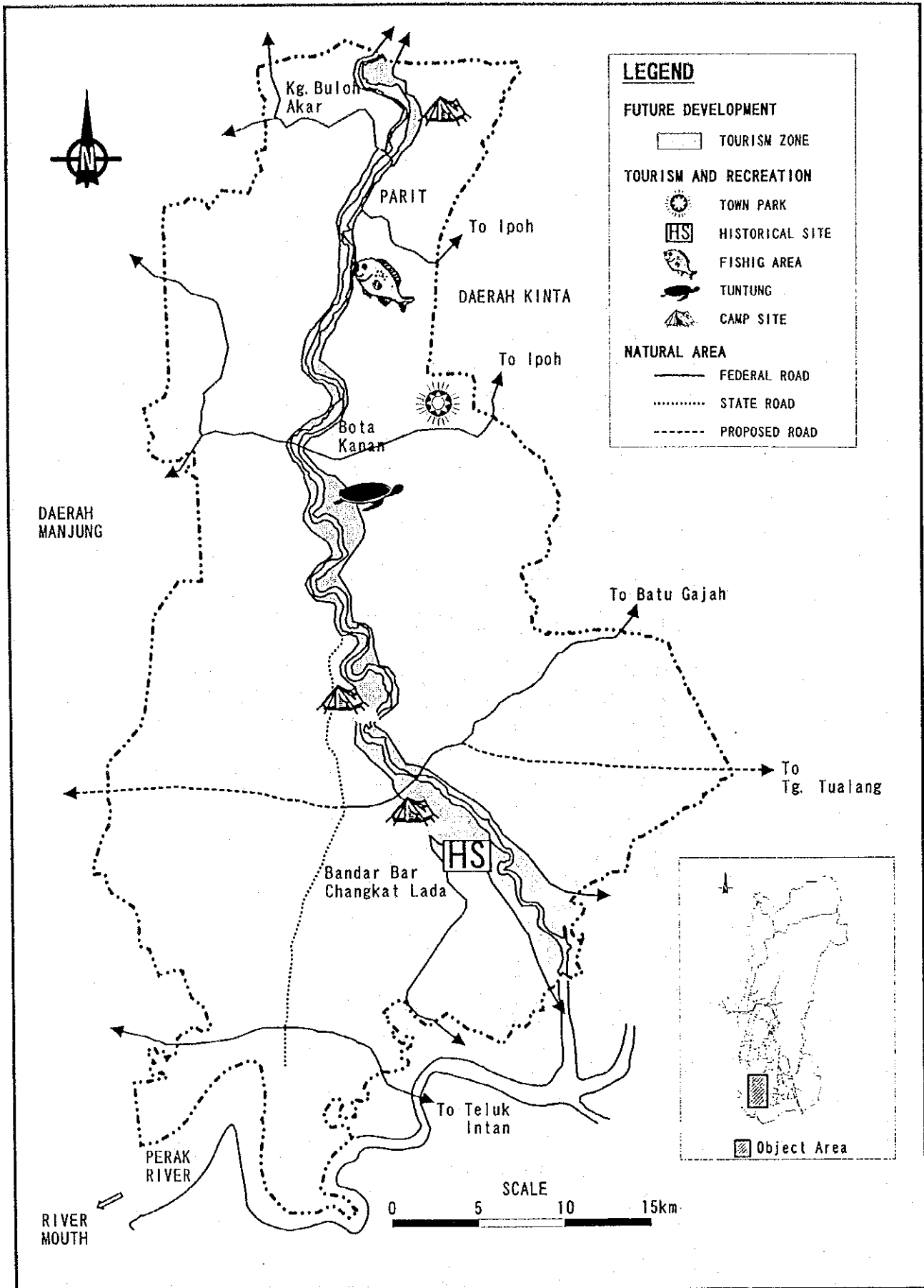
Fig. II-10 ANNUAL TREND OF WATER QUALITY IN SG. PERAK AND SG. KINTA



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Fig. II-11 LOCATION OF MAJOR POLLUTANT
SOURCES FOR OPERATIONAL
SYSTEM



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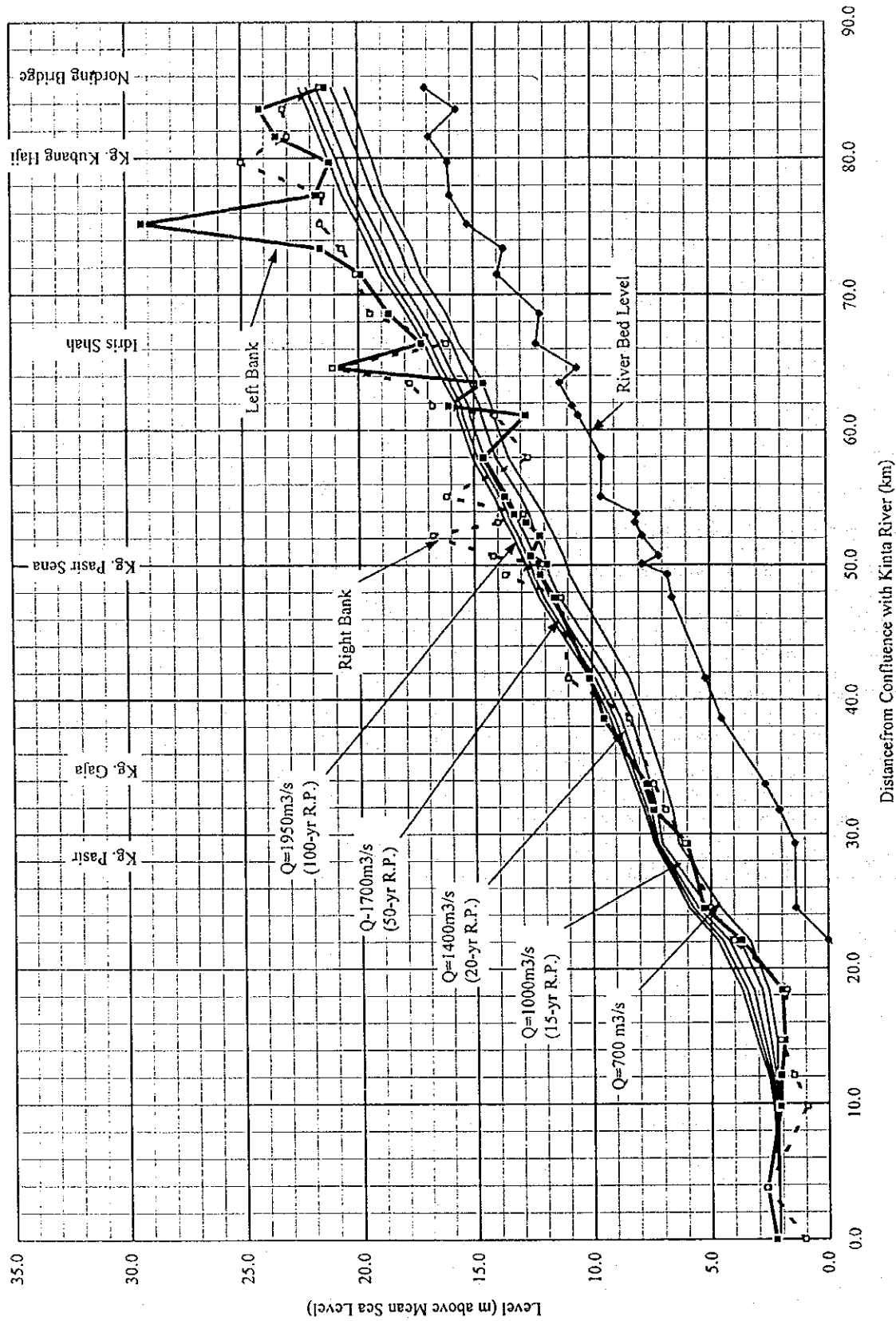
Fig. II-12 ECHO-TOURISM ZONE AND FACILITIES ALONG PERAK RIVER

Items to be Established	8th MP	9th MP	10th MP	11th MP
	(2001-2005)	(2006-2010)	(2011-2015)	(2016-2020)
1. Gauging/Monitoring System				
(1) Water stage gauging (expansion of the existing network)	●			
(2) Portable information terminal (PIT)	●			
(3) Automatic water quality gauge		●		
(4) Radar rainfall gauge			●	
(5) Industrial television (ITV)				●
2. Processing System				
(1) Data base server	●			
(2) Input/output devices	●			
(3) Computer for analysis of real-time water quality data		●		
(4) Computer for analysis of radar rainfall gauge data			●	
(5) Audio Control Server				●
3. Data Transmission System				
(1) Telemetry system (expansion of the existing system)	●			
(2) Optical fiber network (between KL - Ipoh and within the area of KL)	●			
(2) Telemetry system (for real-time water quality)		●		
(3) Multiplex radio wave system (for radar rainfall gauge)			●	
(4) Optical fiber network (within Perak river basin)				●

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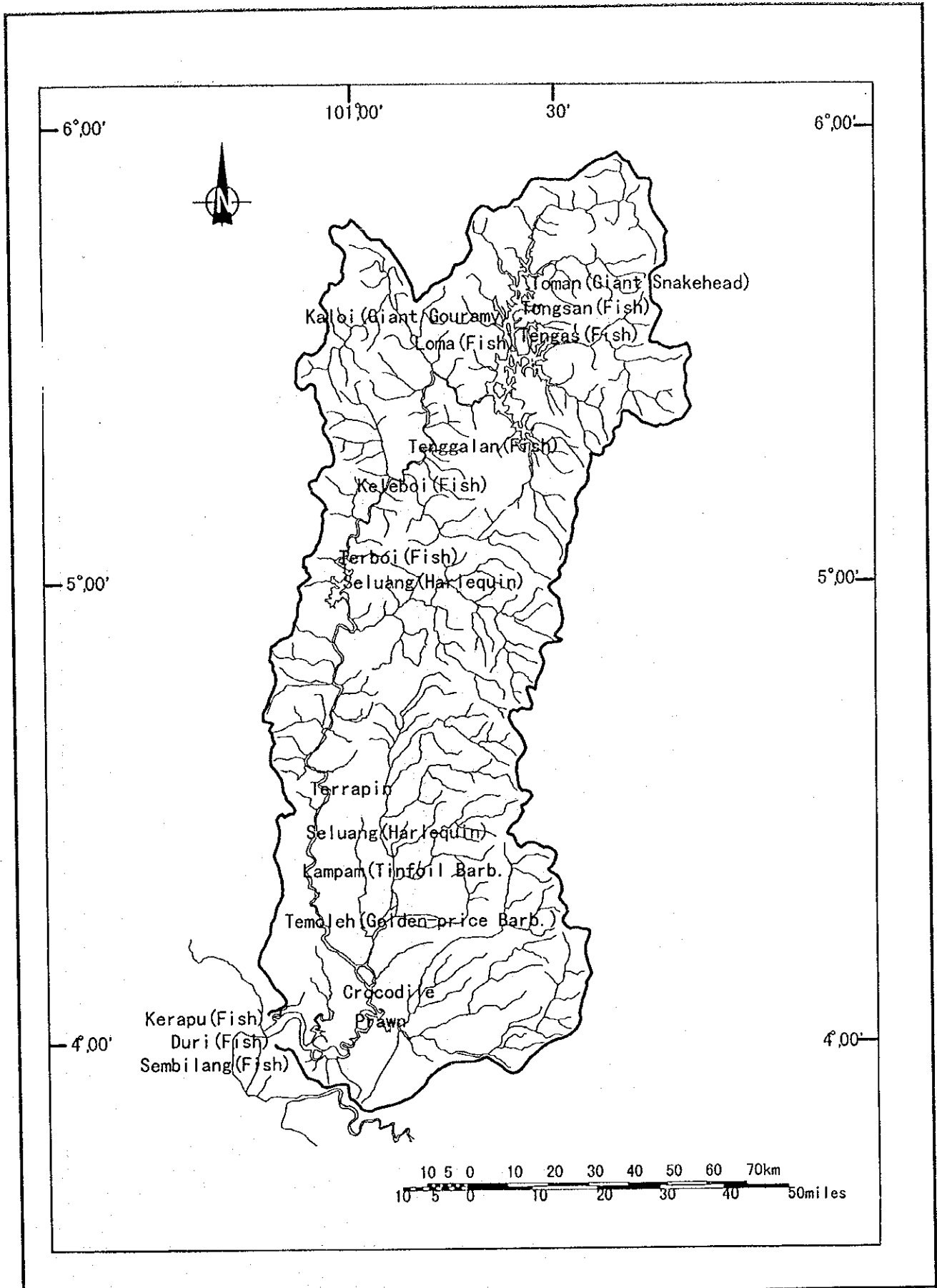
Fig. II-13 PROJECT IMPLEMENTATION
SCHEDULE



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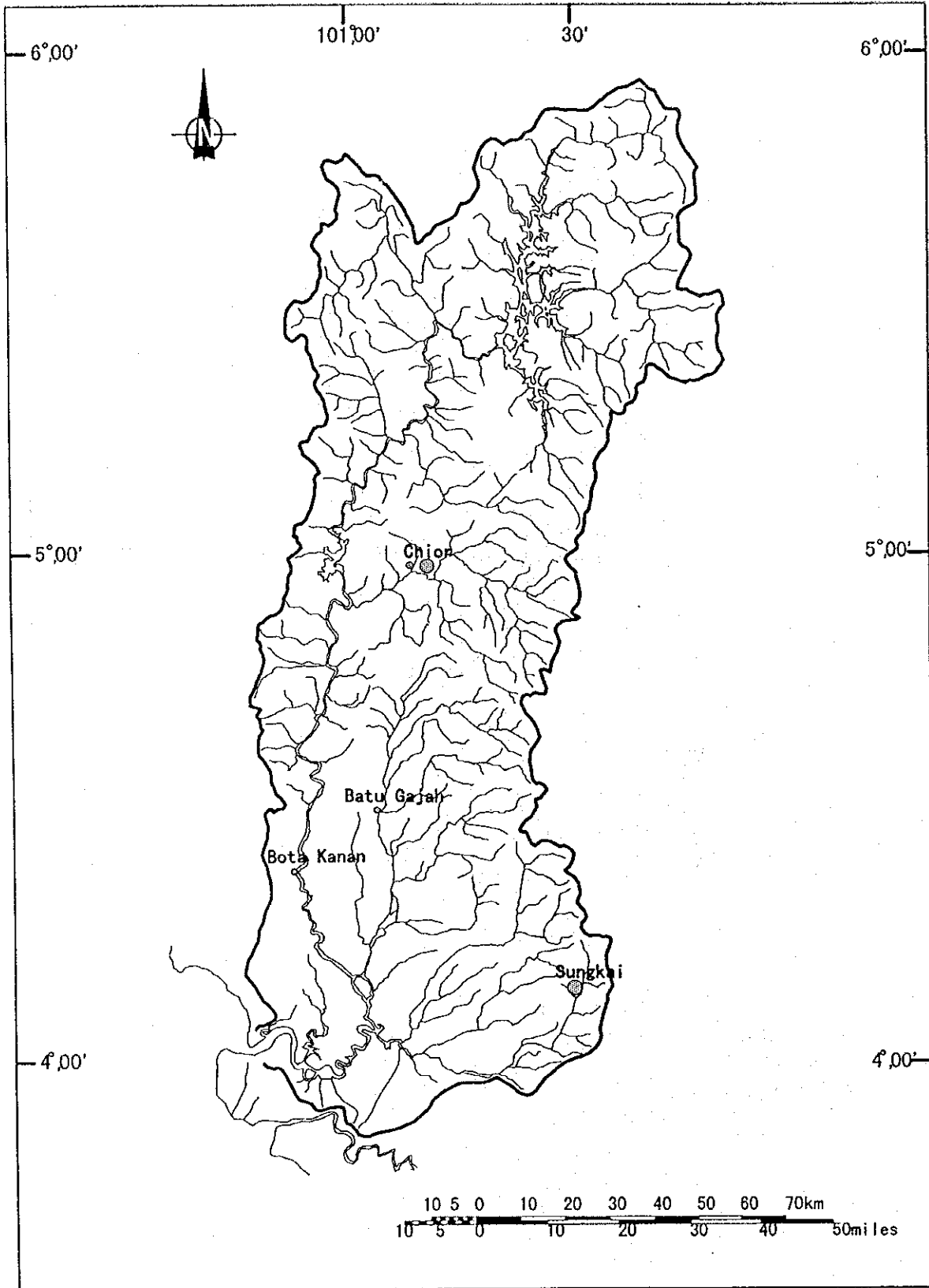
Fig. II-14 PROFILE OF RIVER CHANNEL AND
PROBABLE WATER LEVEL



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Fig. II-15 AQUATIC WILDLIFE OF PERAK
RIVER

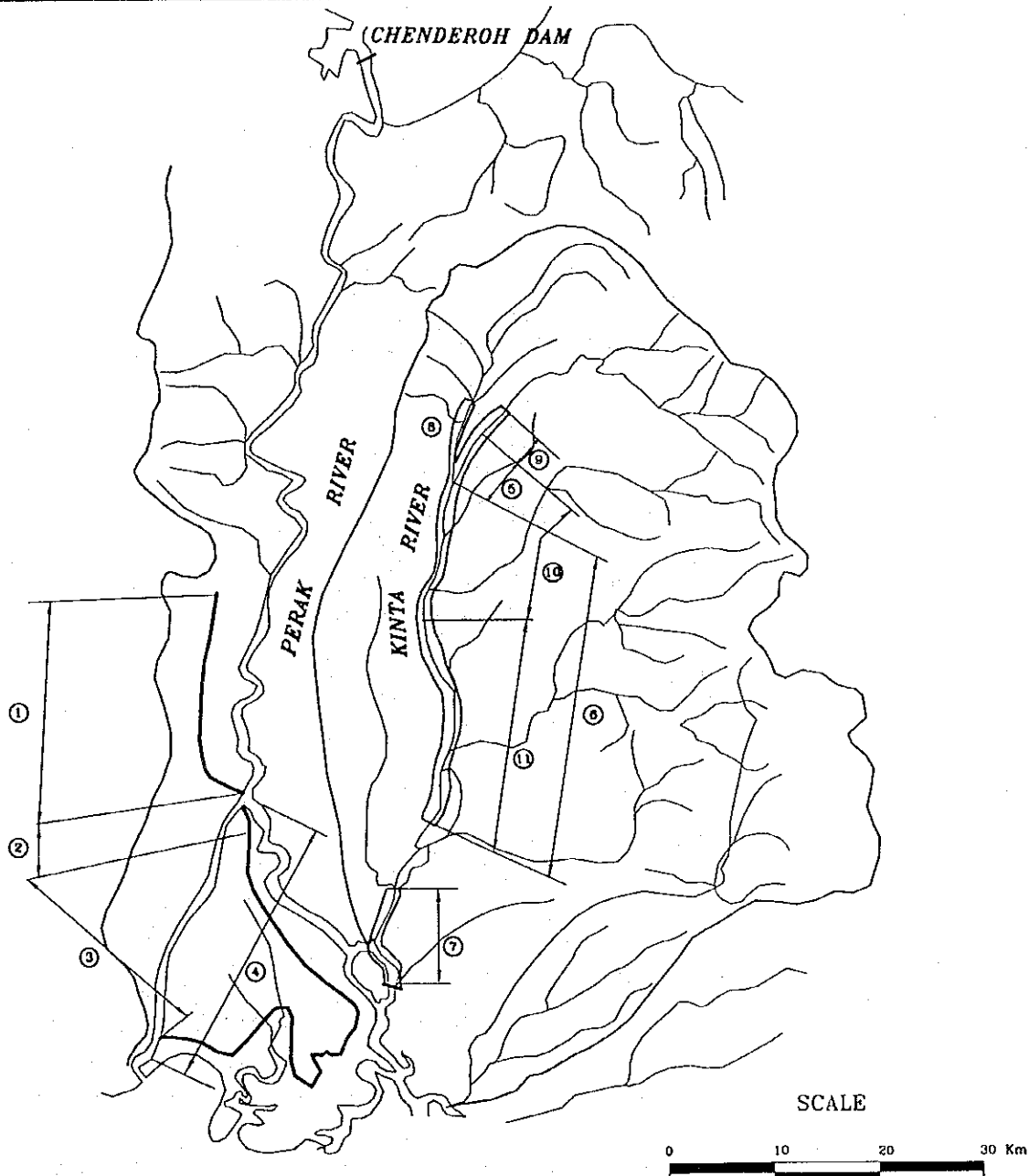


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BASIN INFORMATION SYSTEM IN MALAYSIA

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Fig. II-16 LOCATION OF PROTECTED AREA IN
PERAK RIVER BASIN

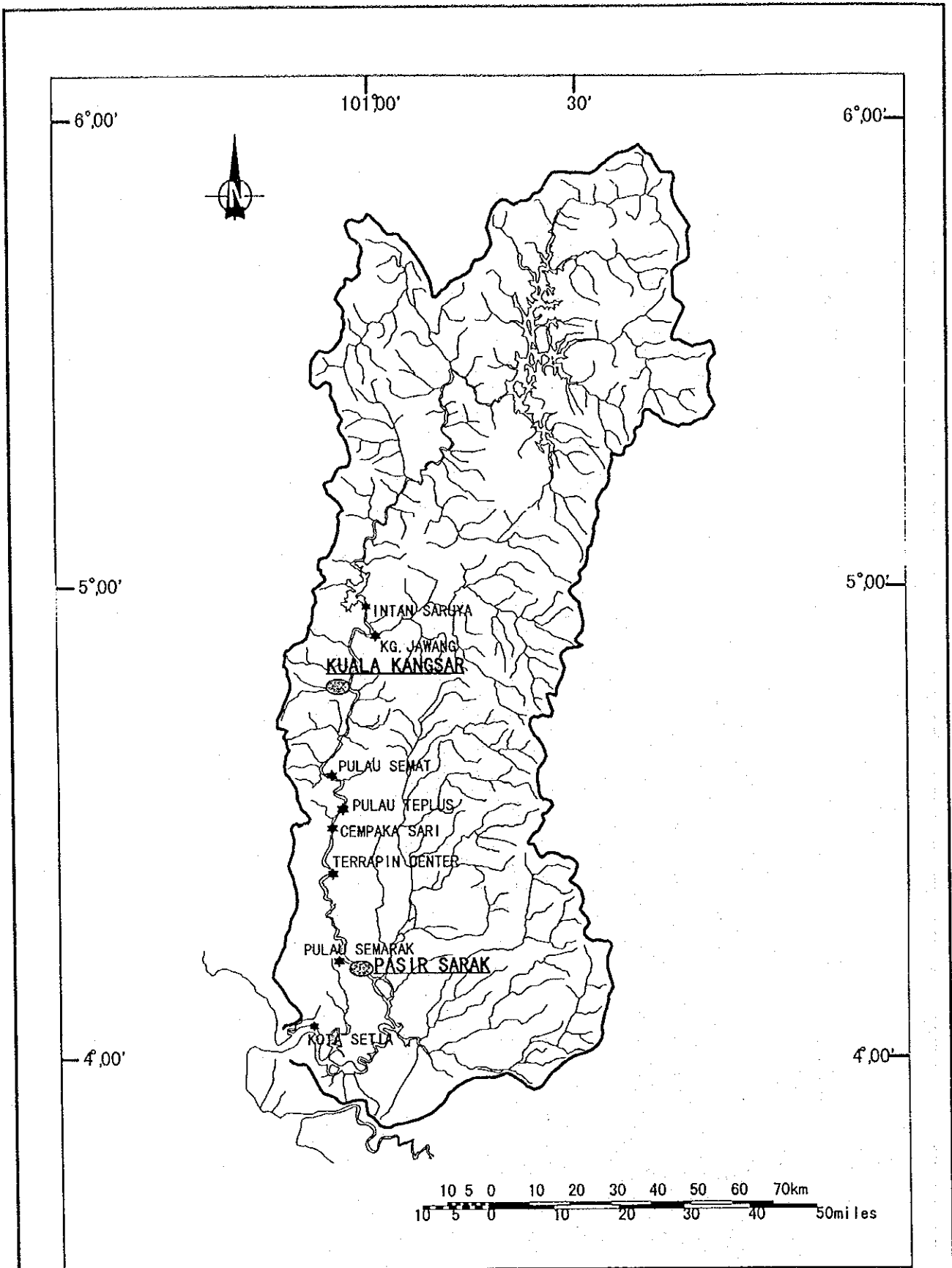
River	No.	Name of Scheme	Existing/ Proposed
Perak	①	Tran-Perak Stage IV Embankment	Existing
	②	Lambor Kiri Embankment	Existing
	③	Stage 1 Drain Embankment	Existing
	④	Perak Flood Bypass	Proposed
Kinta	⑤	Ipoh Flood Mitigation Scheme	Existing
	⑥	Kinta Conservancy Scheme	Existing
	⑦	Malaysia Mining Company Diversion	Existing
	⑧	Pari Scheme	Existing
	⑨	Dg. Kinta Upgrading Scheme	Proposed
	⑩	Bund Upgrading (1)	Proposed
	⑪	Bund Upgrading (2)	Proposed



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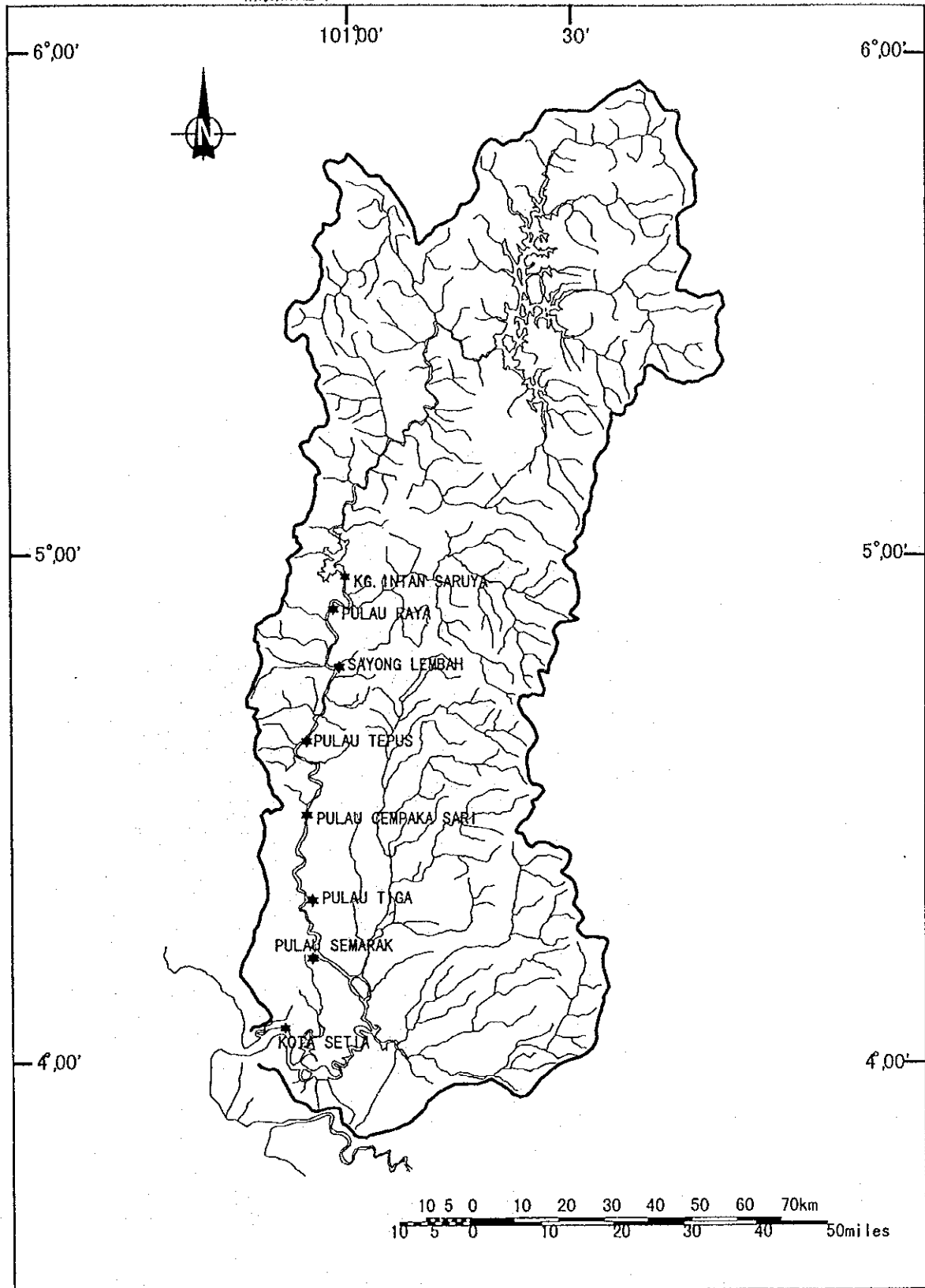
Fig. II-17 LOCATION MAP OF EXISTING AND
PROPOSED FLOOD MITIGATION
WORKS



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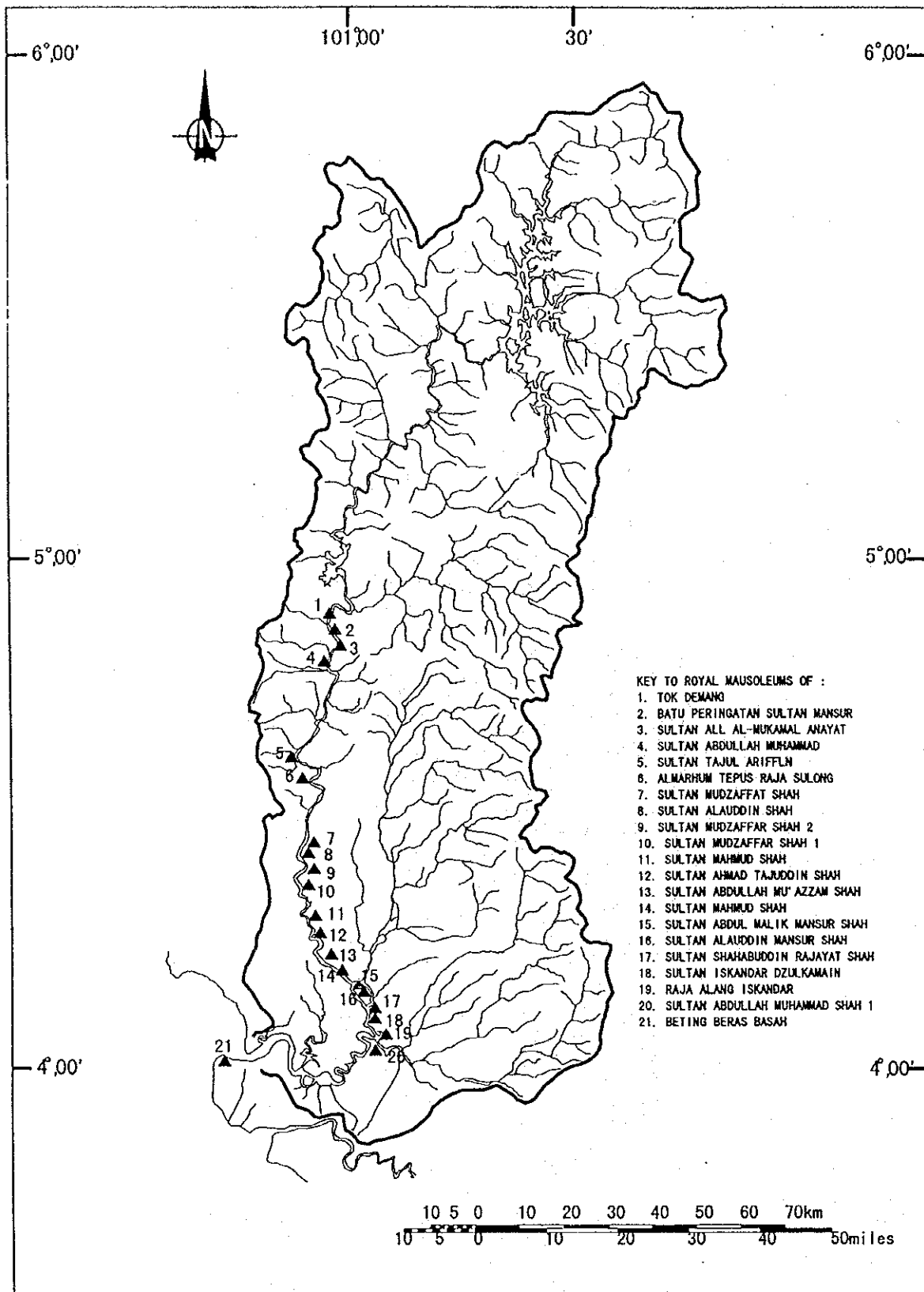
Fig. II-18 LOCATION OF RIVER PARKS



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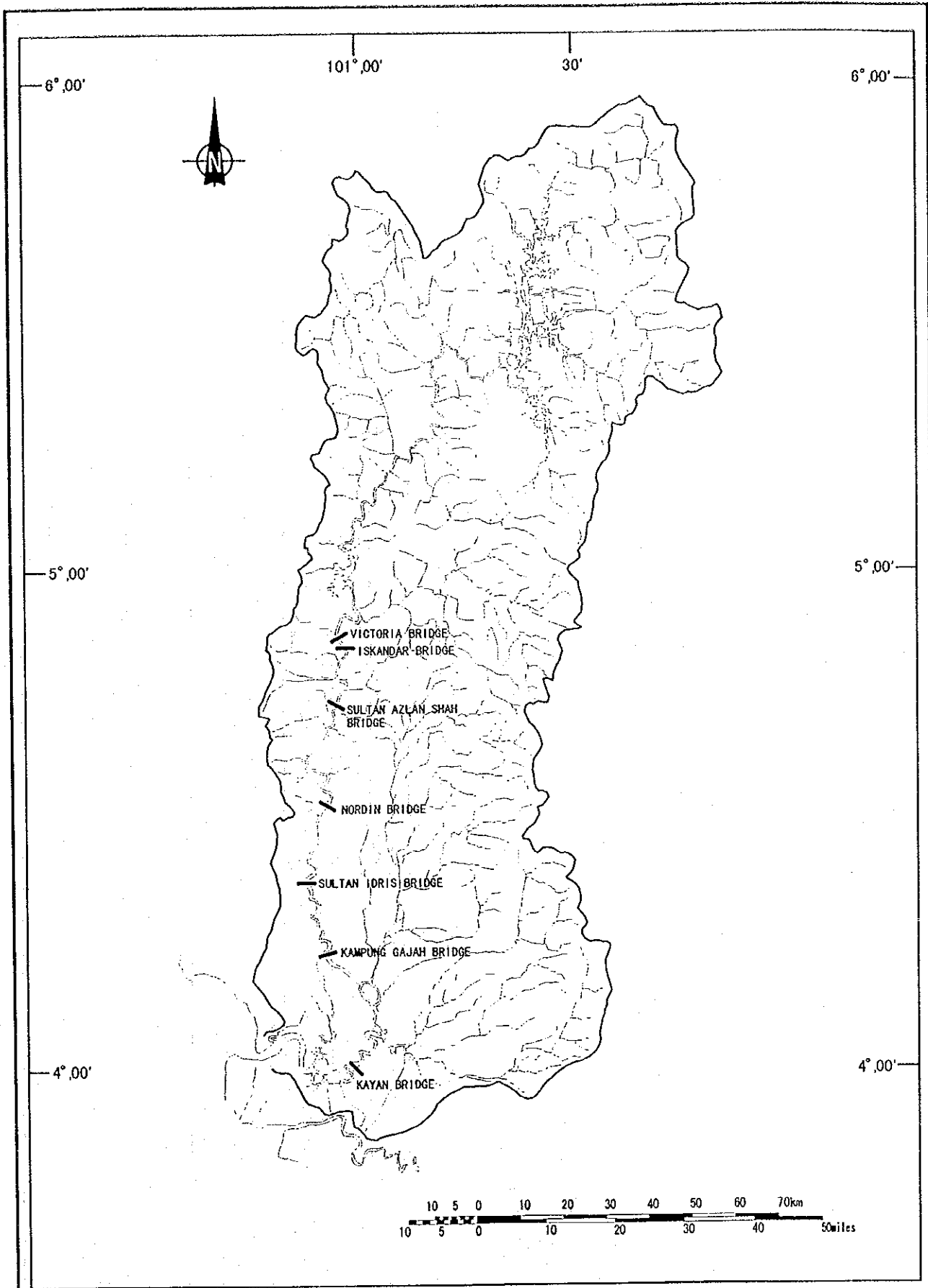
Fig. II-19 LOCATION OF CAMP SITES



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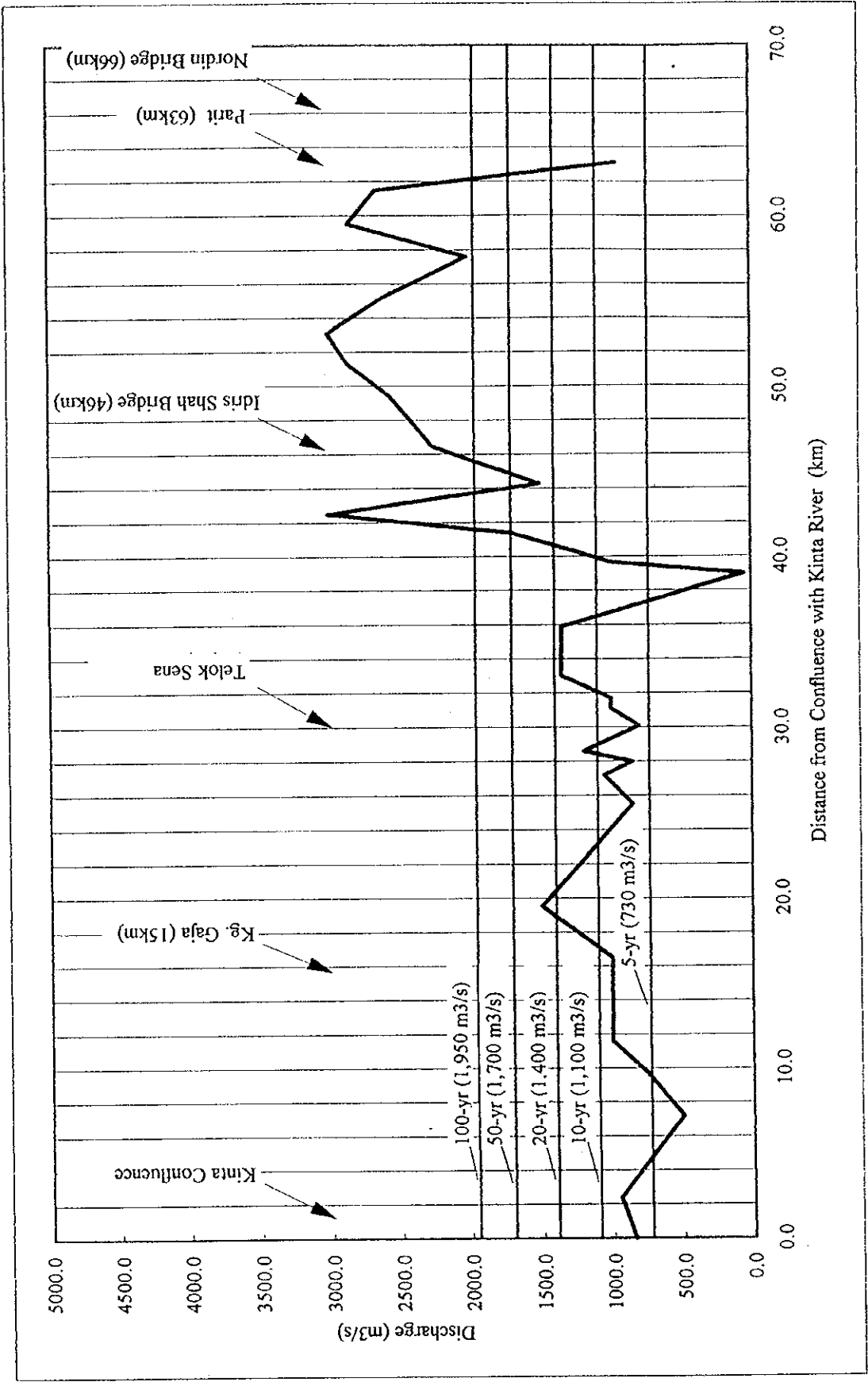
Fig. II-20 LOCATION OF ROYAL
MAUSOLEUMS



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BASIN INFORMATION SYSTEM IN MALAYSIA

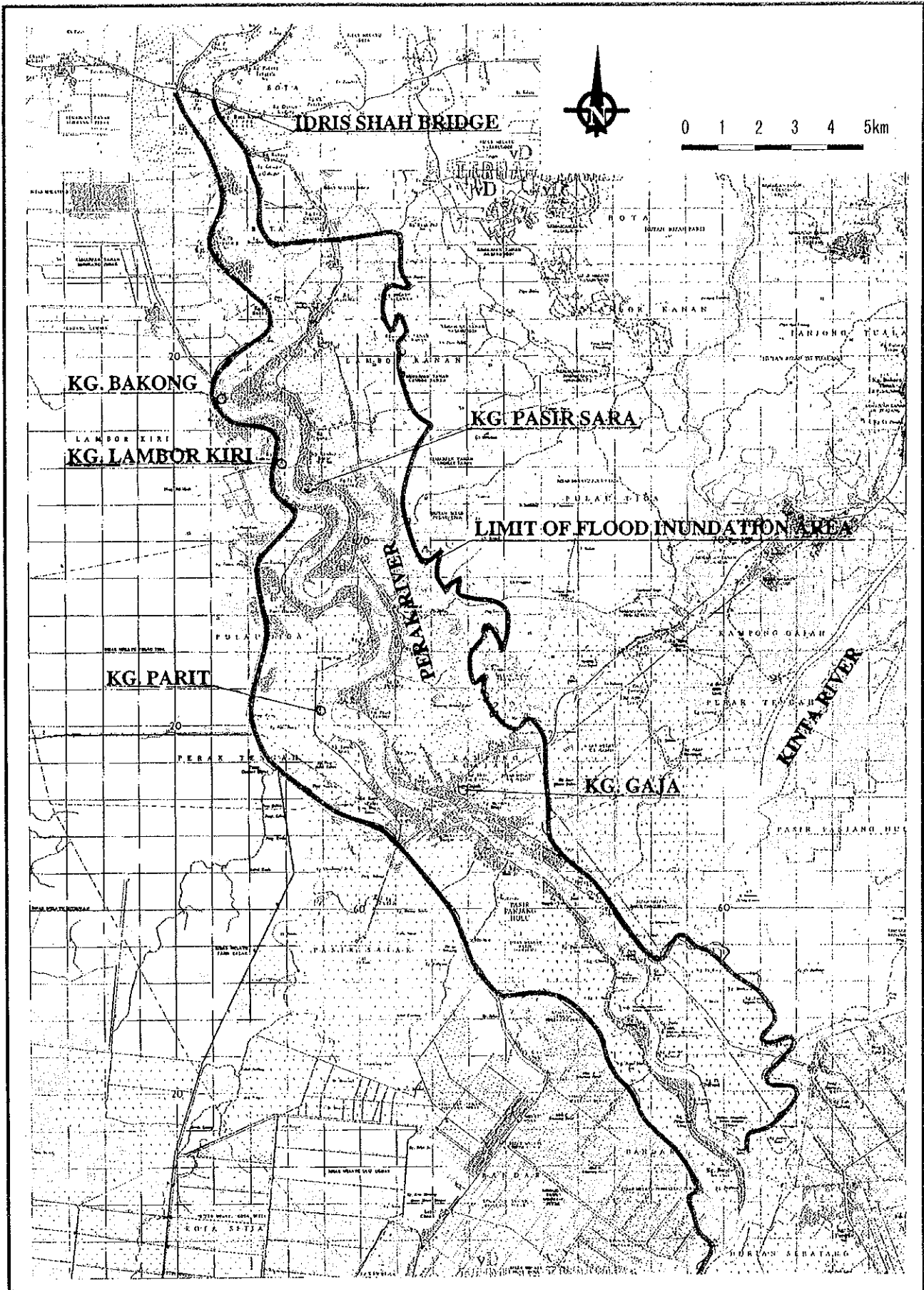
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Fig. II-21 LOCATION MAP OF EXISTING MA-
JOR BRIDGES OVER PERAK RIVER



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 BASIN INFORMATION SYSTEM IN MALAYSIA
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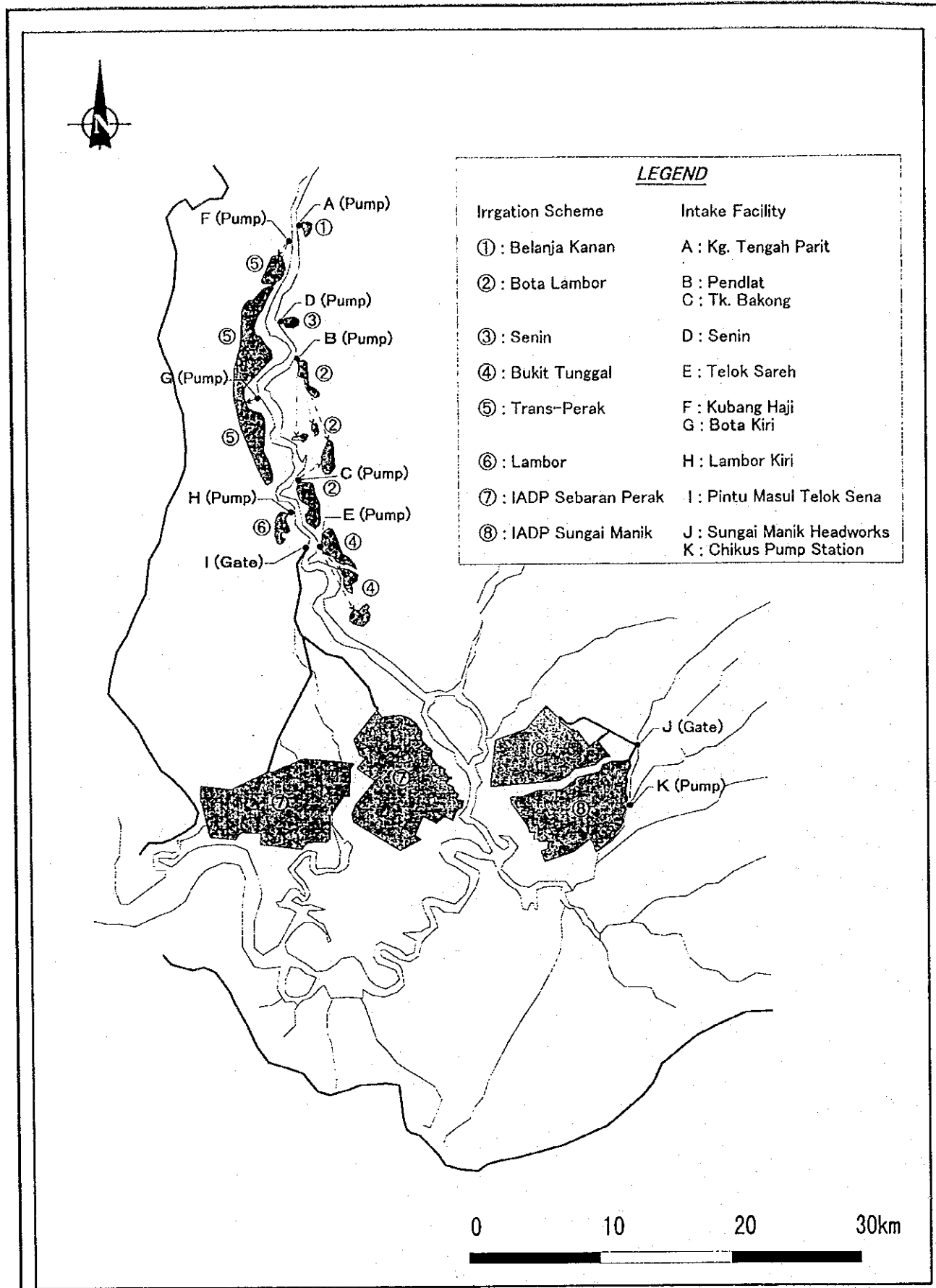
Fig. II-22 PROFILE OF CHANNEL FLOW CAPACITY



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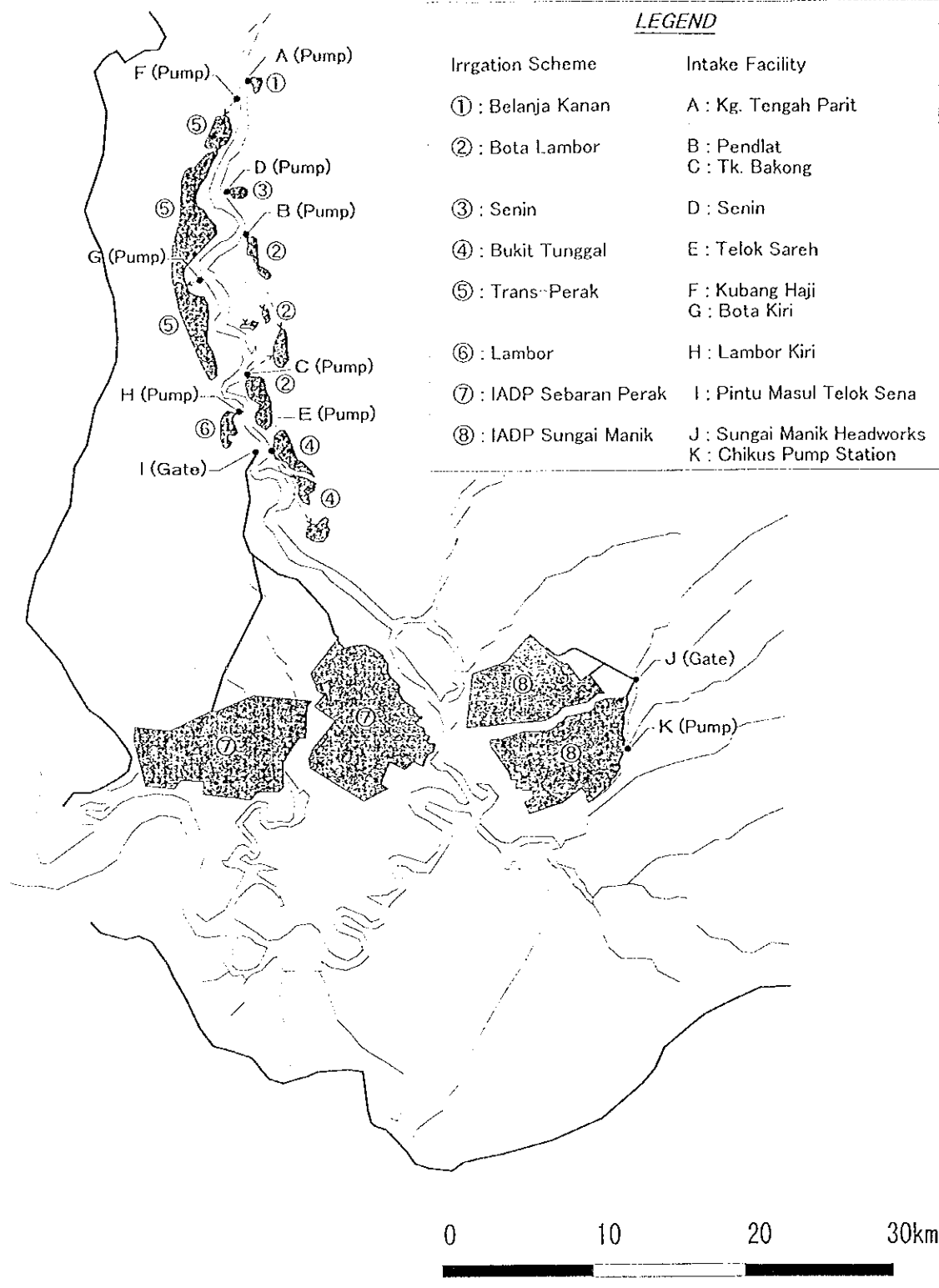
Fig. II-23 HABITUAL FLOOD INUNDATION
INUNDATION AREA



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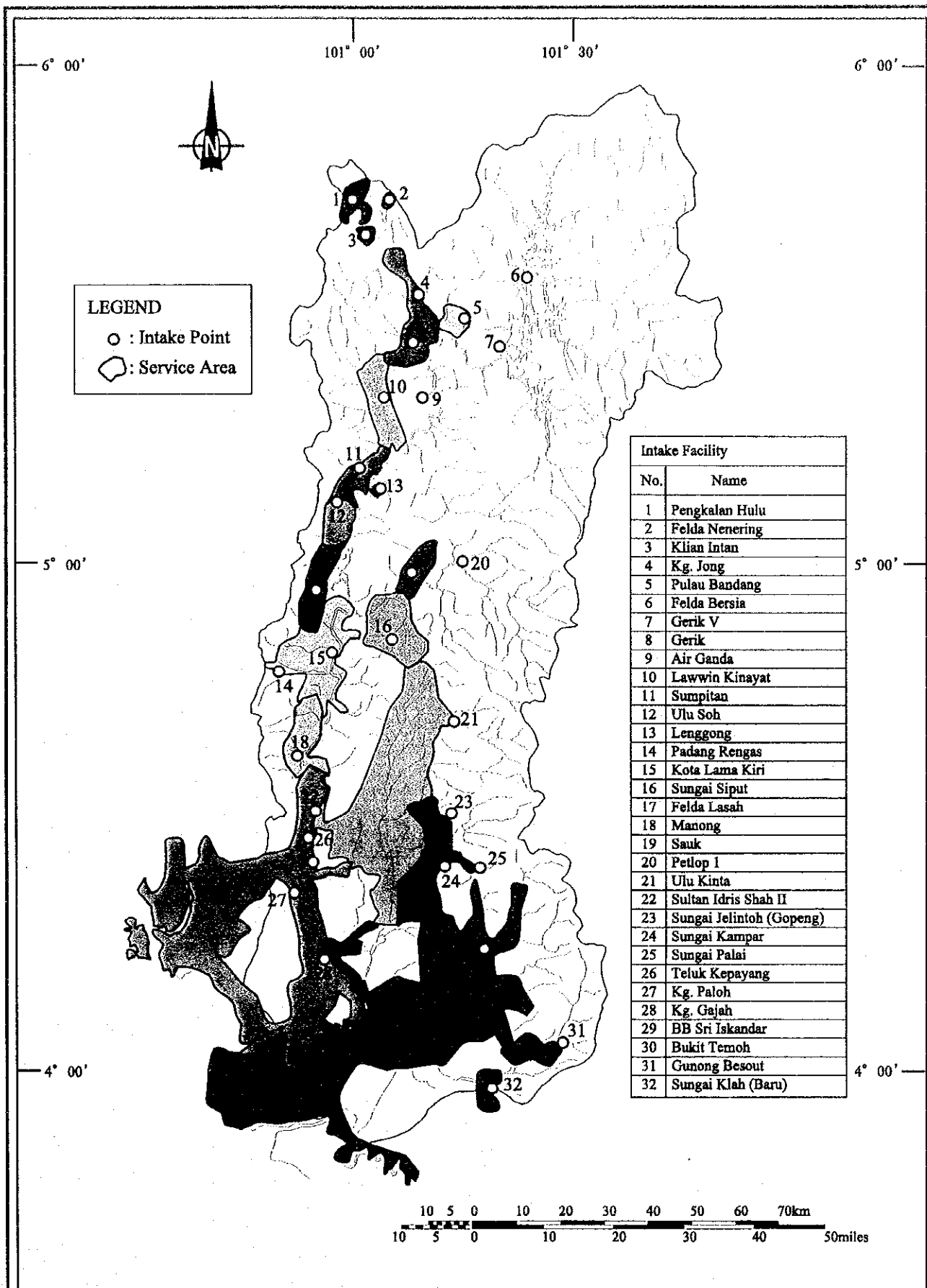
Fig. II-24 LOCATION MAP OF IRRIGATION
SCHEME



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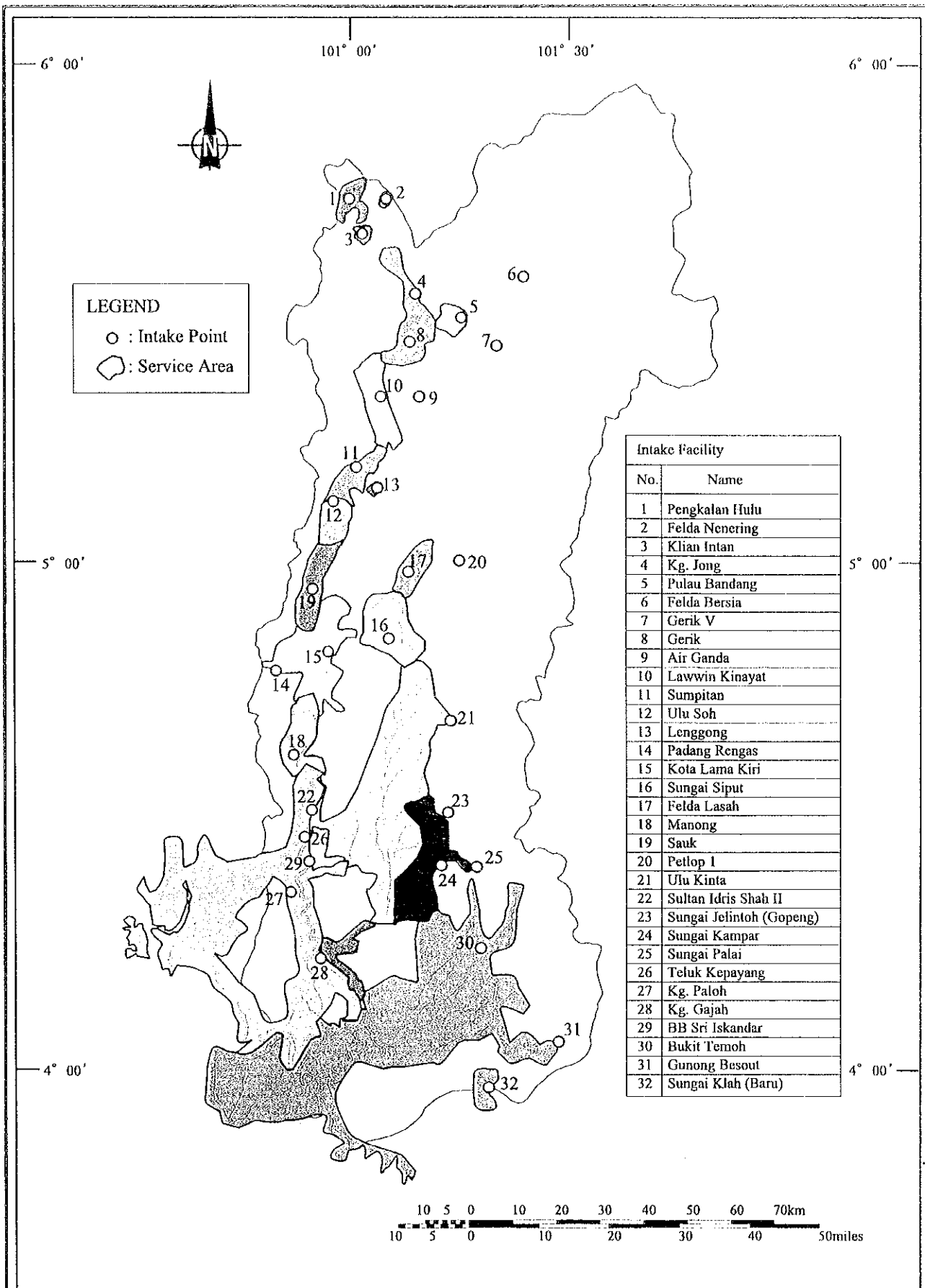
Fig. II-24 LOCATION MAP OF IRRIGATION
SCHEME



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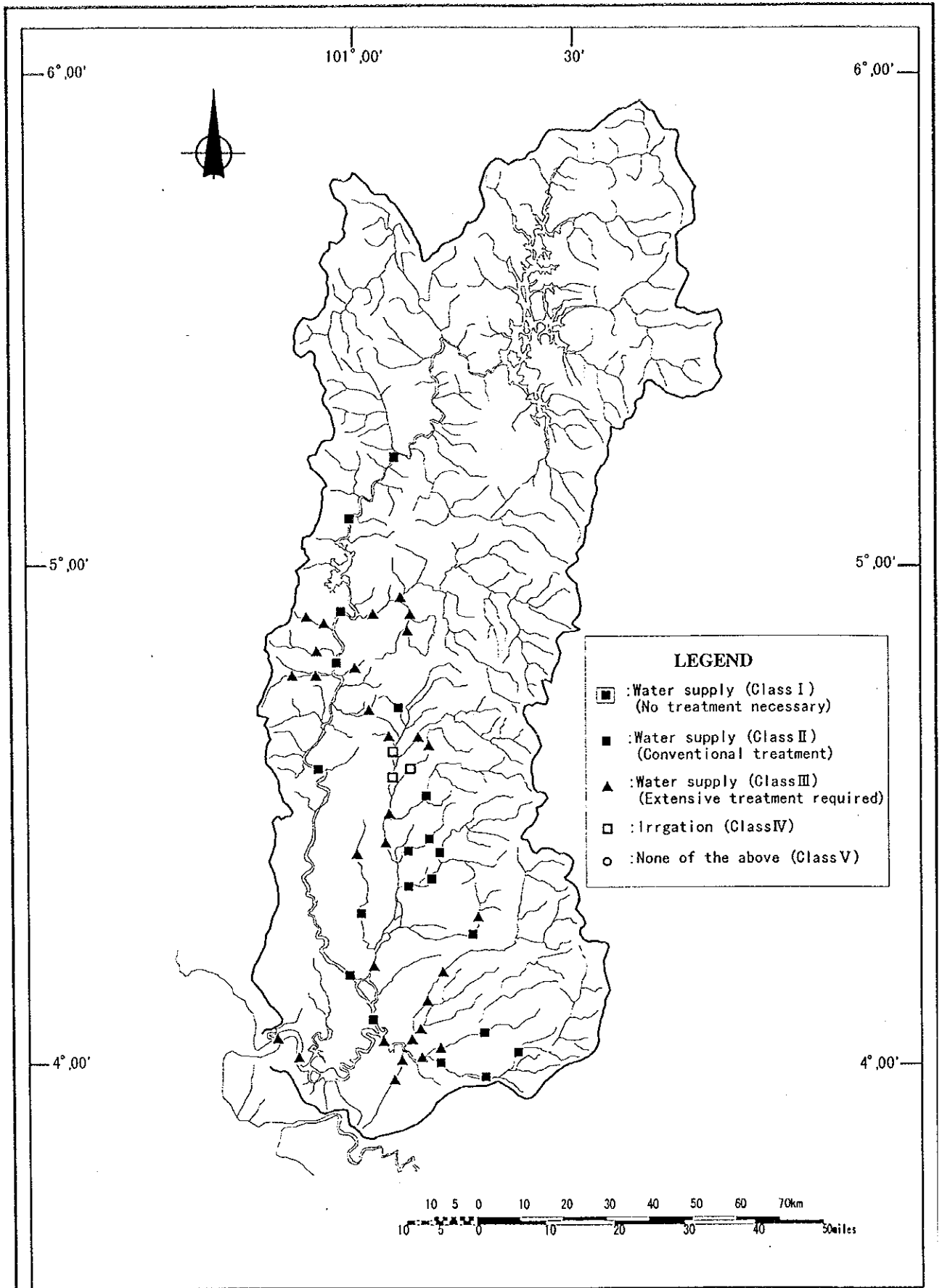
Fig. II-25 LOCATION MAP OF INTAKE POINTS
AND SERVICE AREA FOR DOMESTIC
AND INDUSTRIAL WATER SUPPLY



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Fig. II-25 LOCATION MAP OF INTAKE POINTS
AND SERVICE AREA FOR DOMESTIC
AND INDUSTRIAL WATER SUPPLY

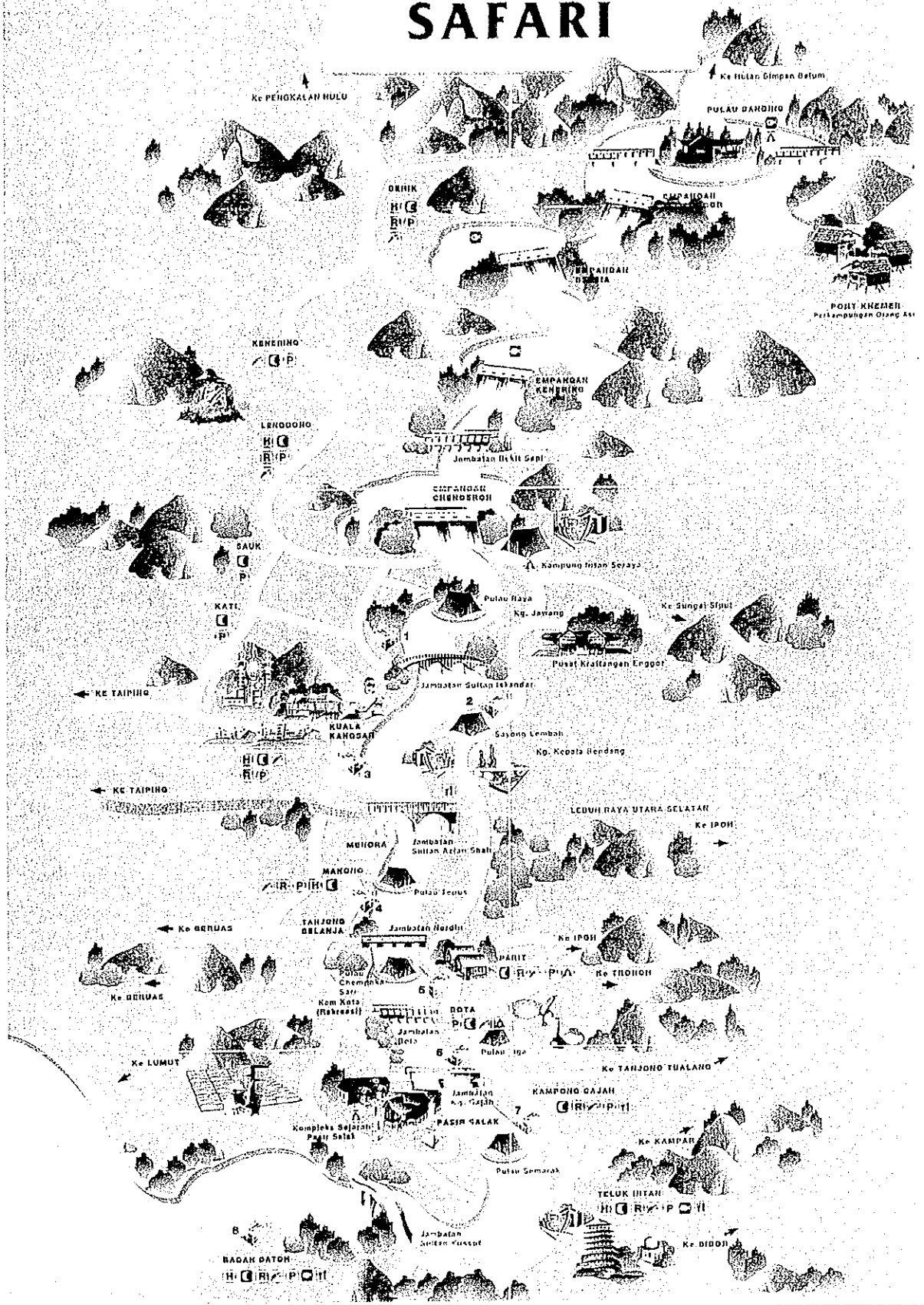


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Fig. II-26 PRESENT RIVER WATER QUALITY
BY WQI

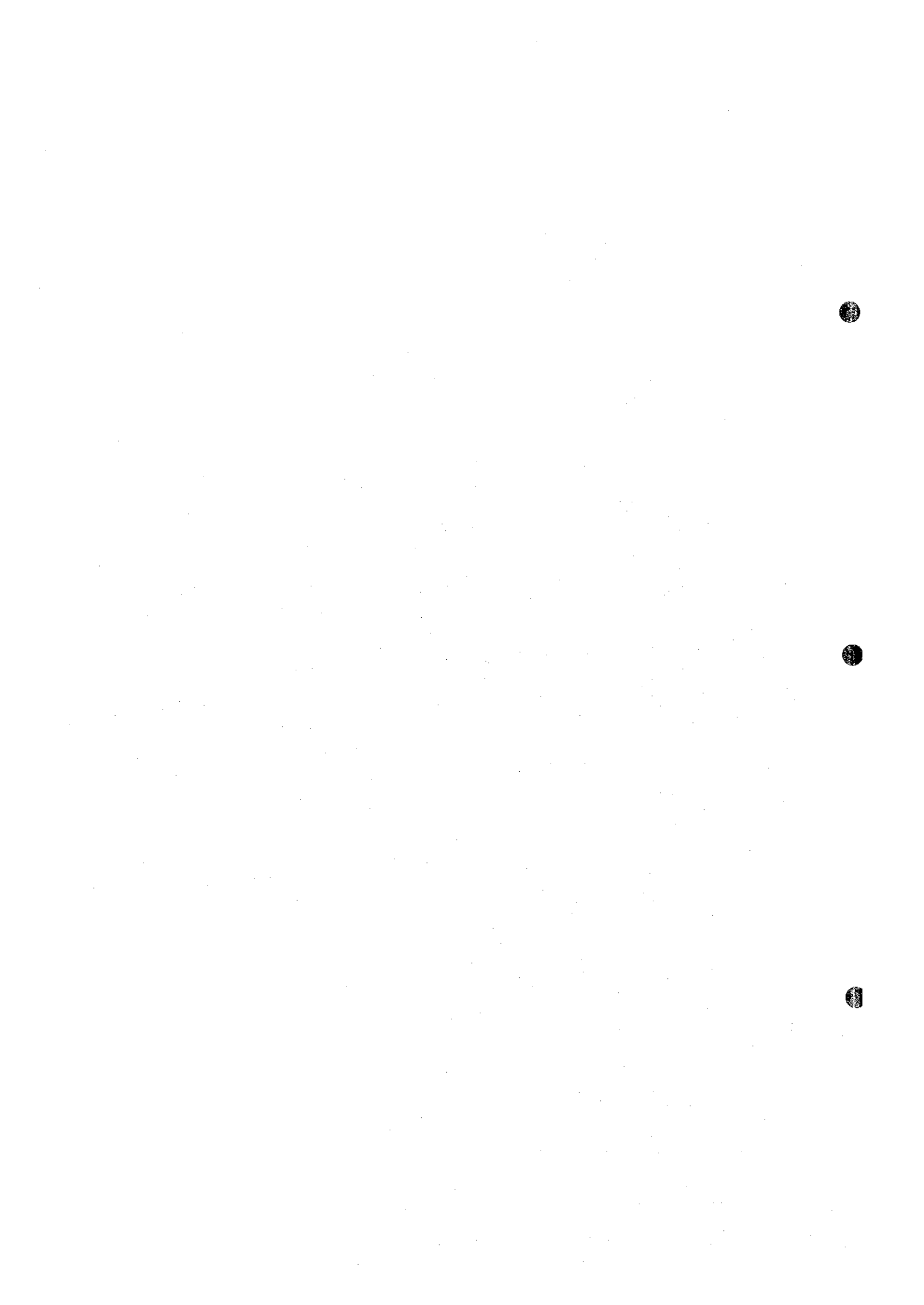
SUNGAI PERAK SAFARI

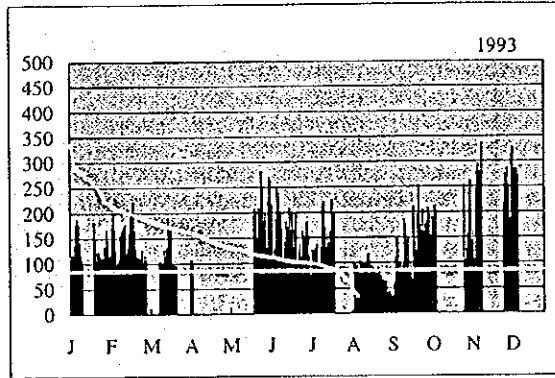
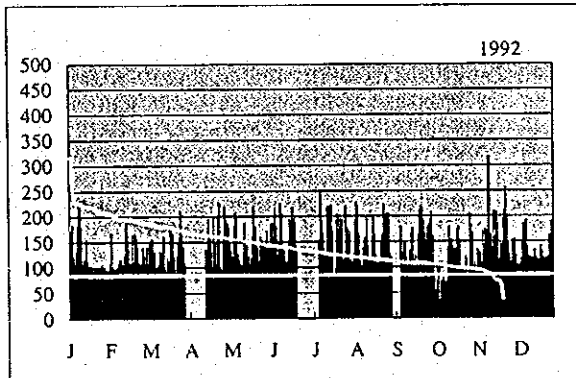
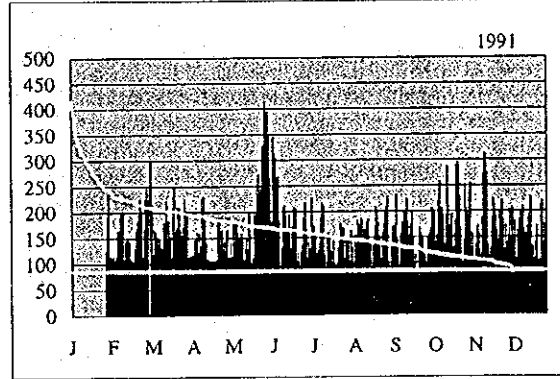
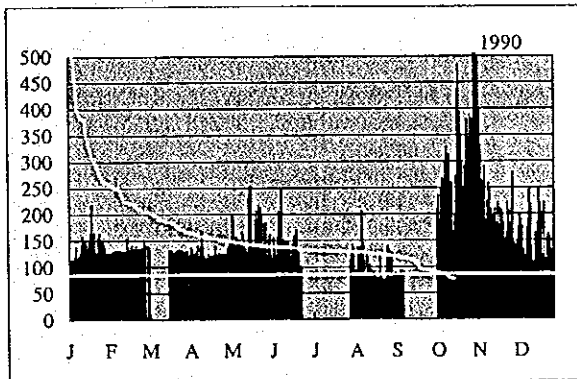
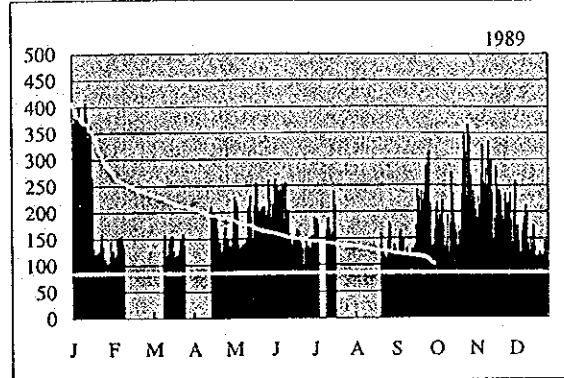
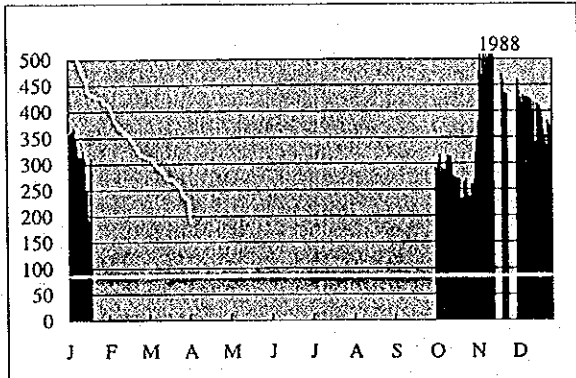
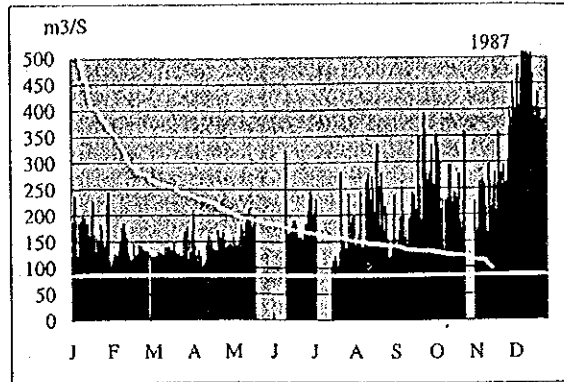
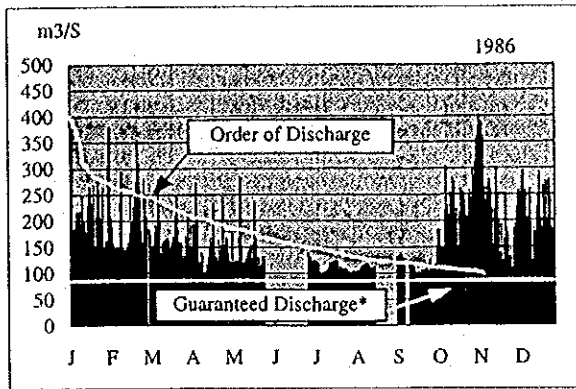


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Fig. II-27 PERAK RIVER SAFARI



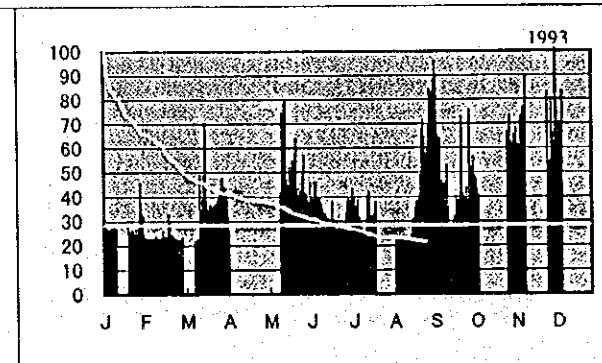
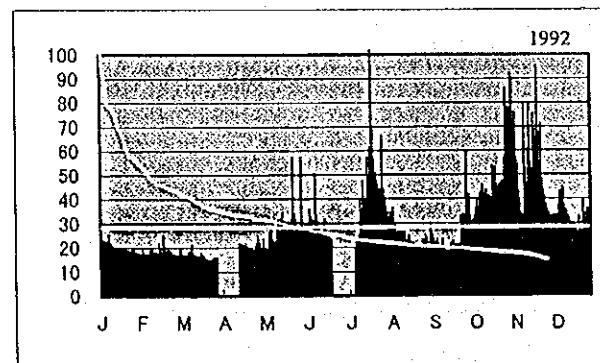
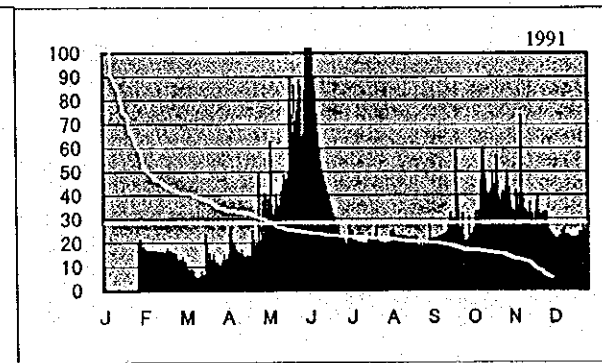
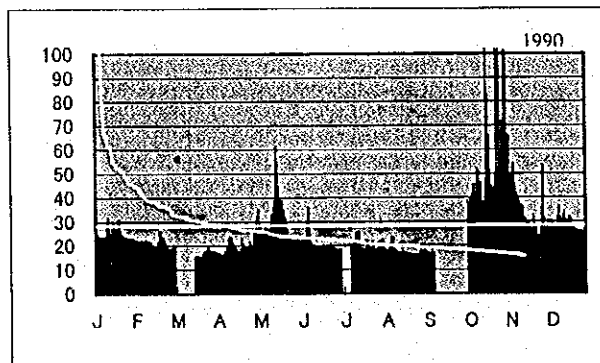
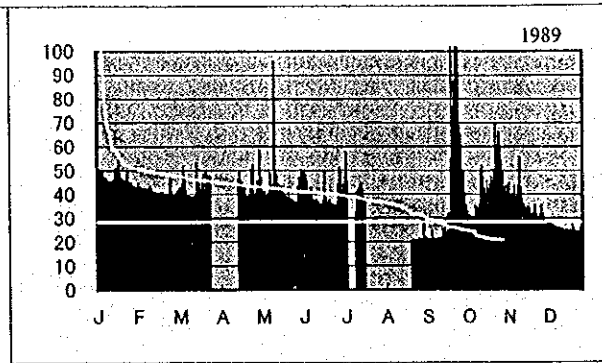
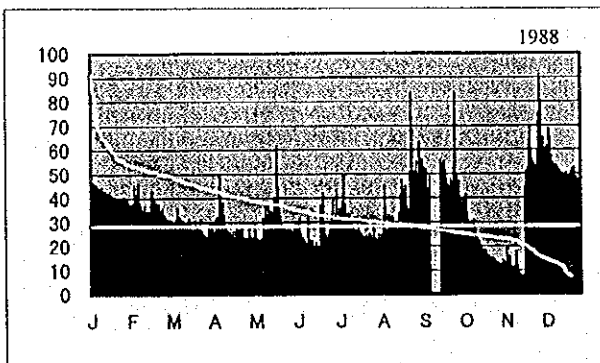
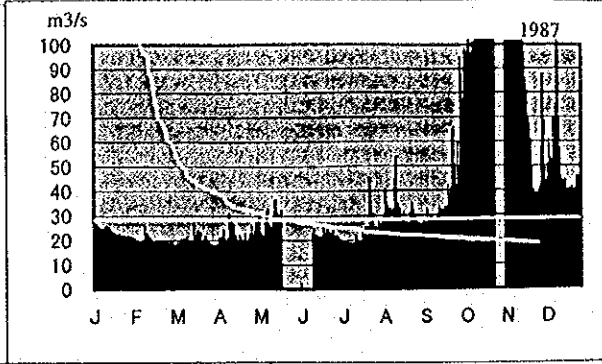
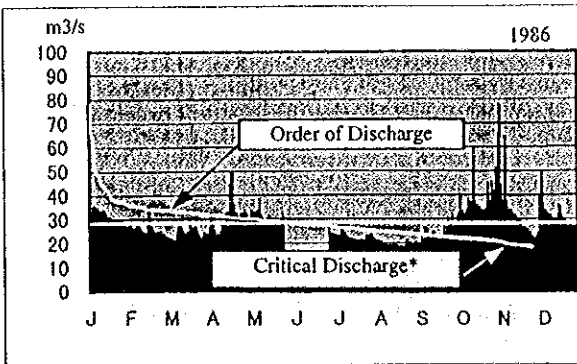


* Guaranteed Discharge from Chenderoh Dam (3000cusec or 84.9m3/s)

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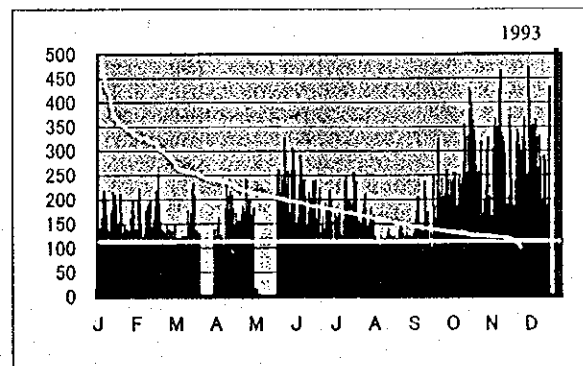
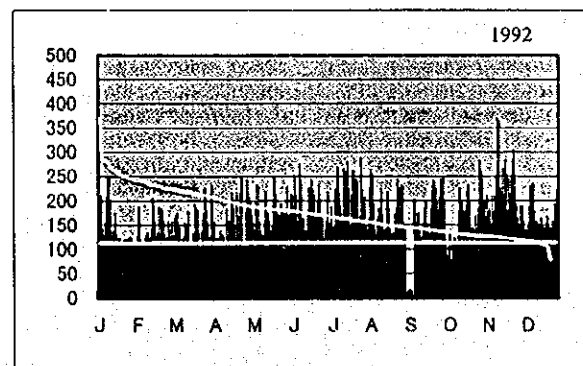
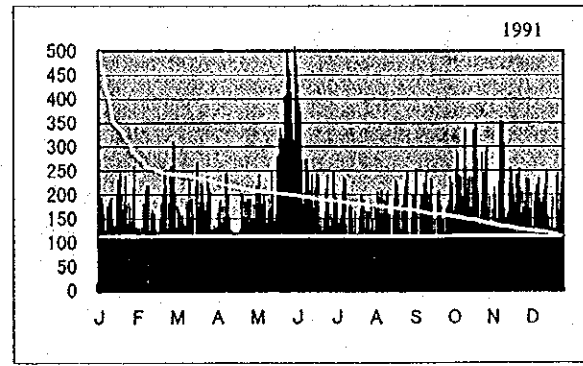
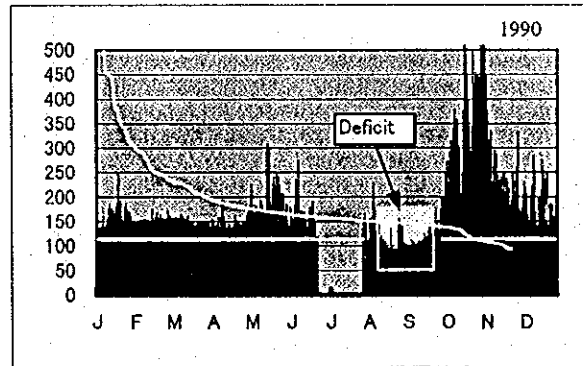
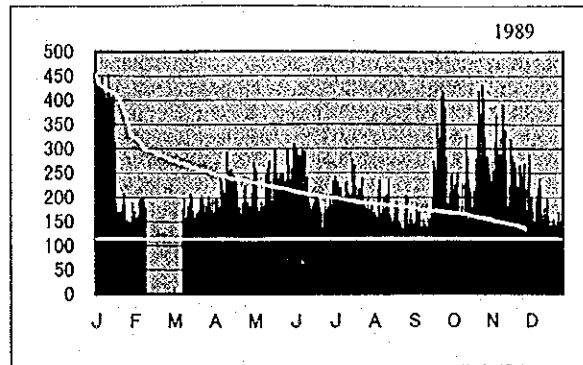
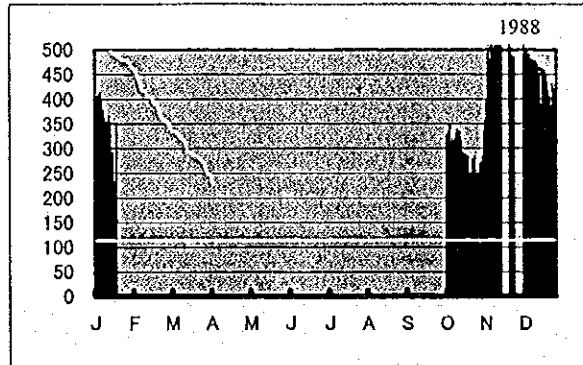
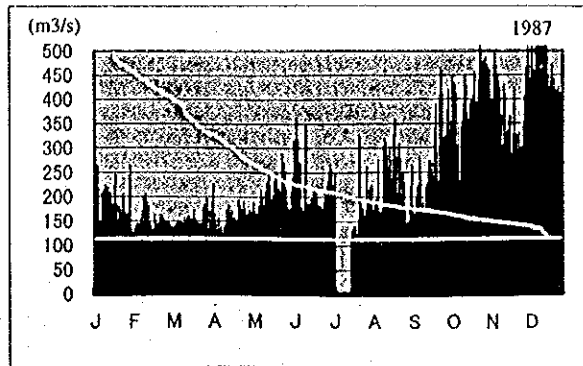
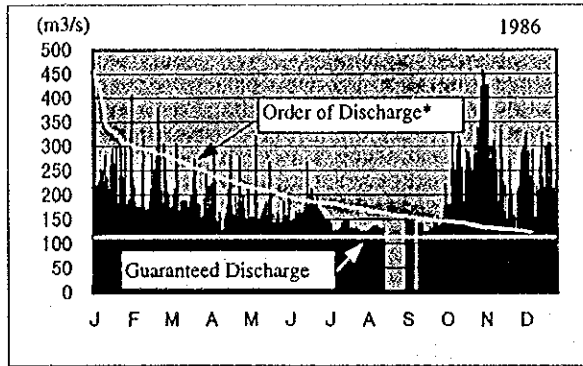
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Fig. II-28 DAILY AVE. OUTFLOW DISCHARGE
FROM CHENDEROH DAM



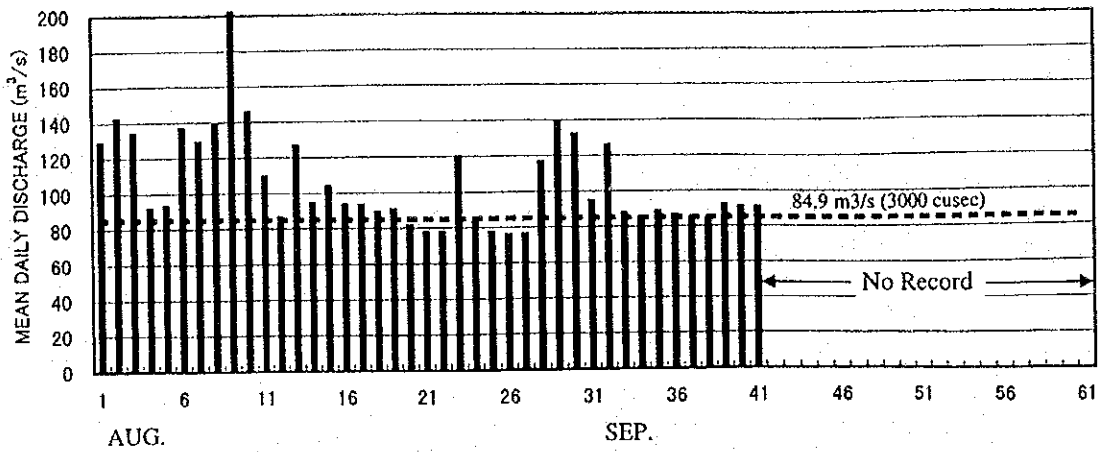
* Critical discharge (1000cusec or 28.3 m3/s) to guarantee the flow discharge at Iskandar Bridge in case of dam outflow of 3000cusec

Fig. II-29 DAILY AVE. RUNOFF DISCHARGE FROM PELUS RIVER

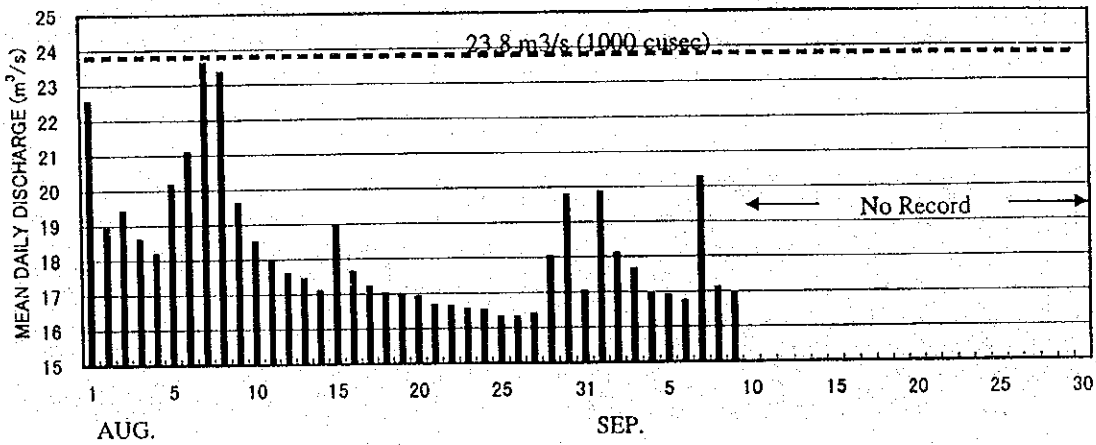


* Guaranteed Discharge at Iskandar Bridge by Chenderoh Dam (4000cosec or 113.2 m³/s)

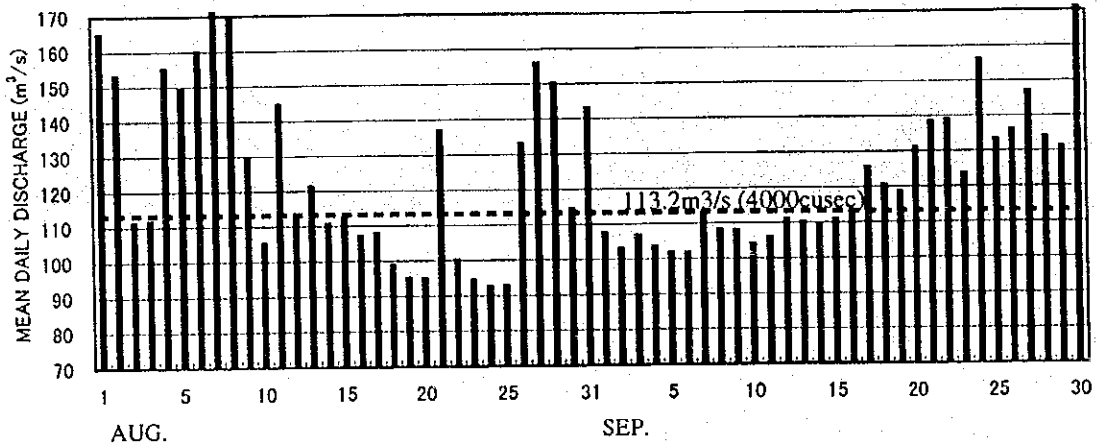
OUTFLOW DISCHARGE FROM CHENDEROH DAM IN 1990



RUNOFF DISCHARGE FROM PELUS RIVER IN 1990



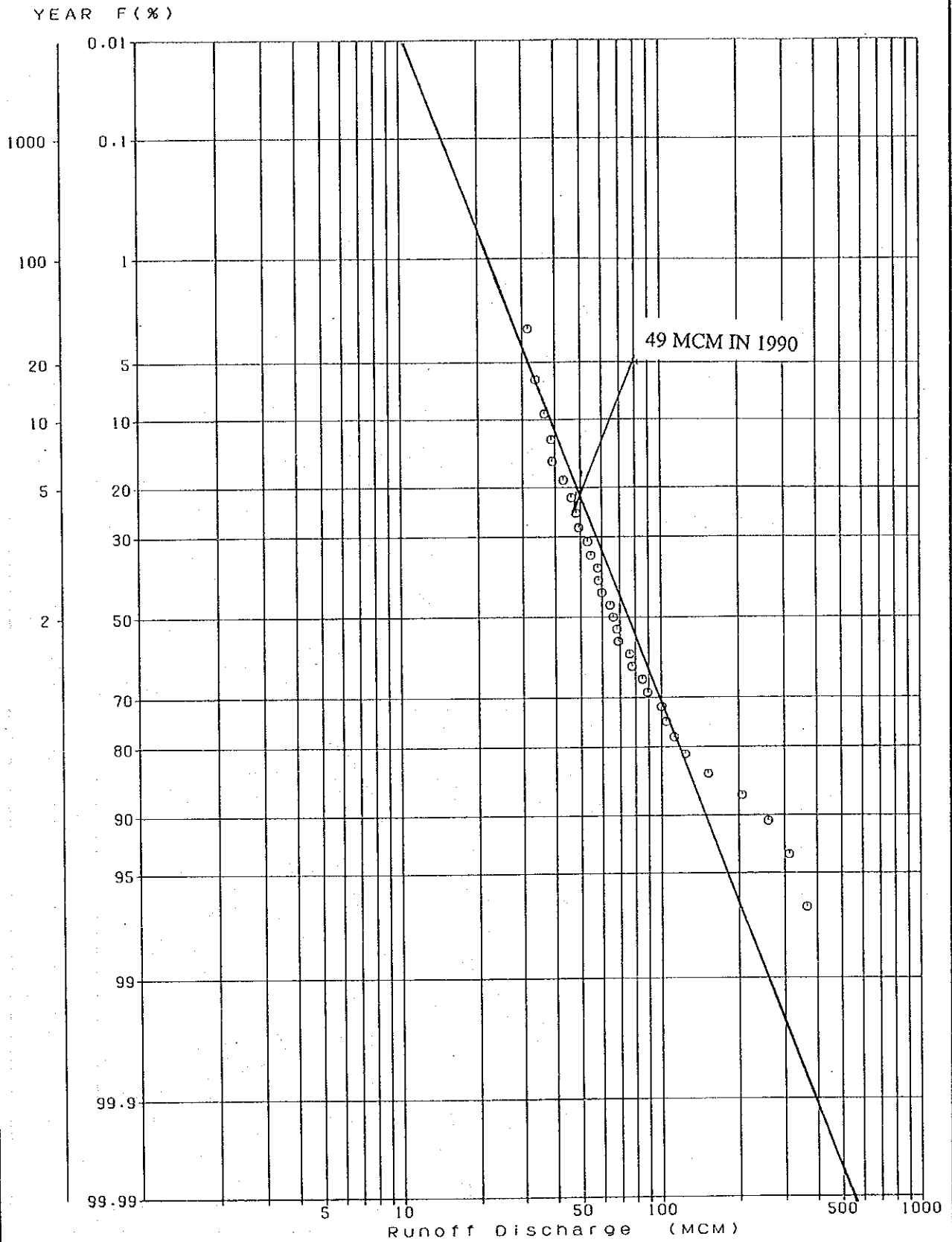
WATER DEFICIT AT ISKANDAR BRIDGE IN 1990



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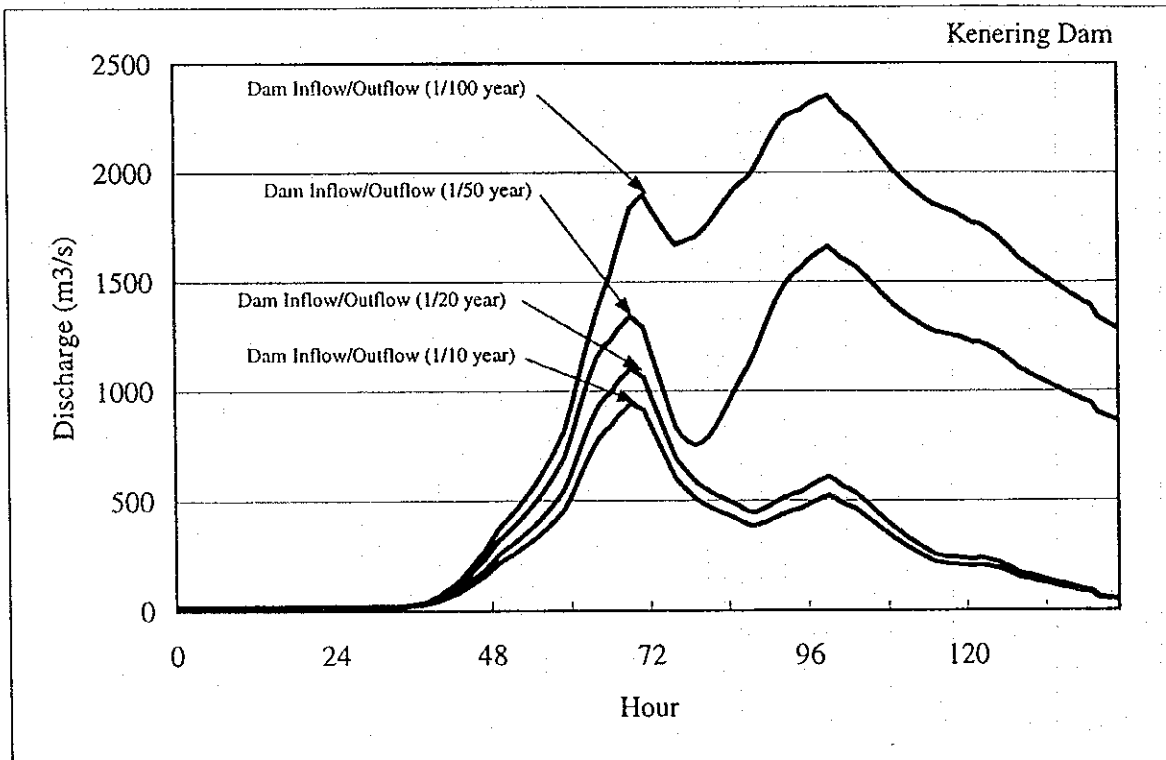
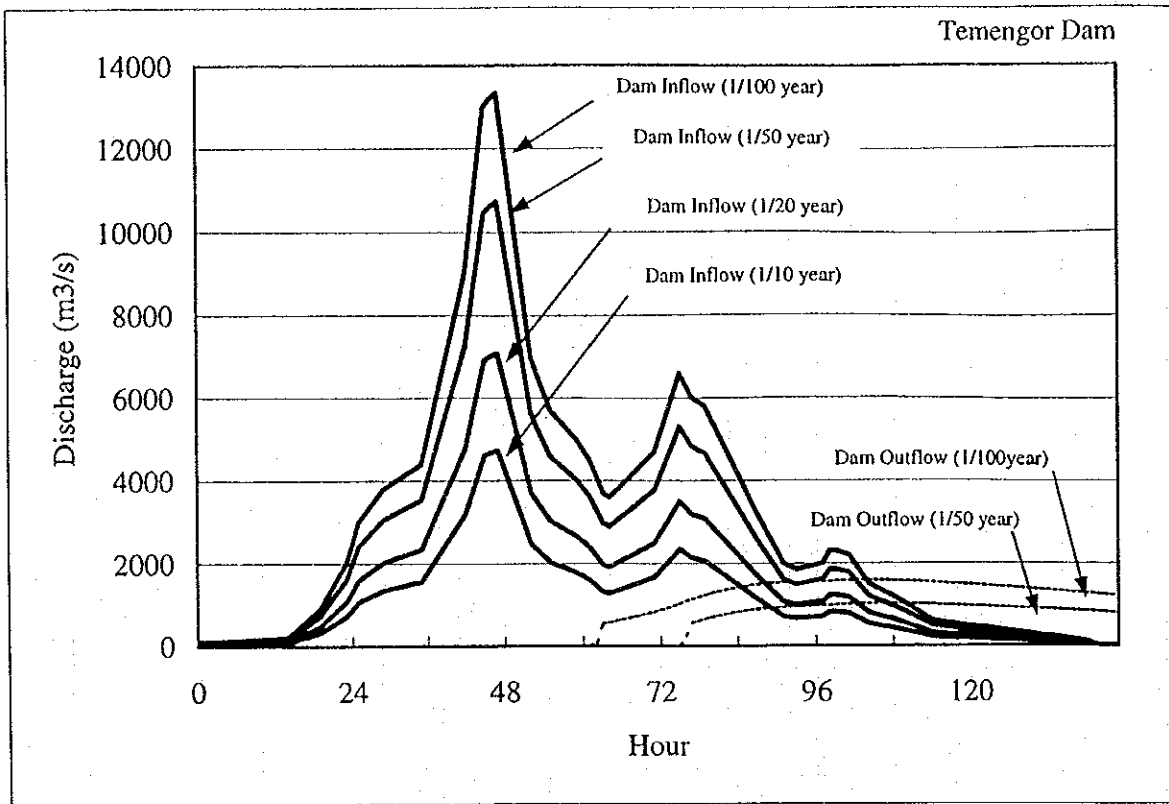
Fig. II-31 RIVER FLOW CONDITIONS DURING
WATER DEFICIT IN 1990

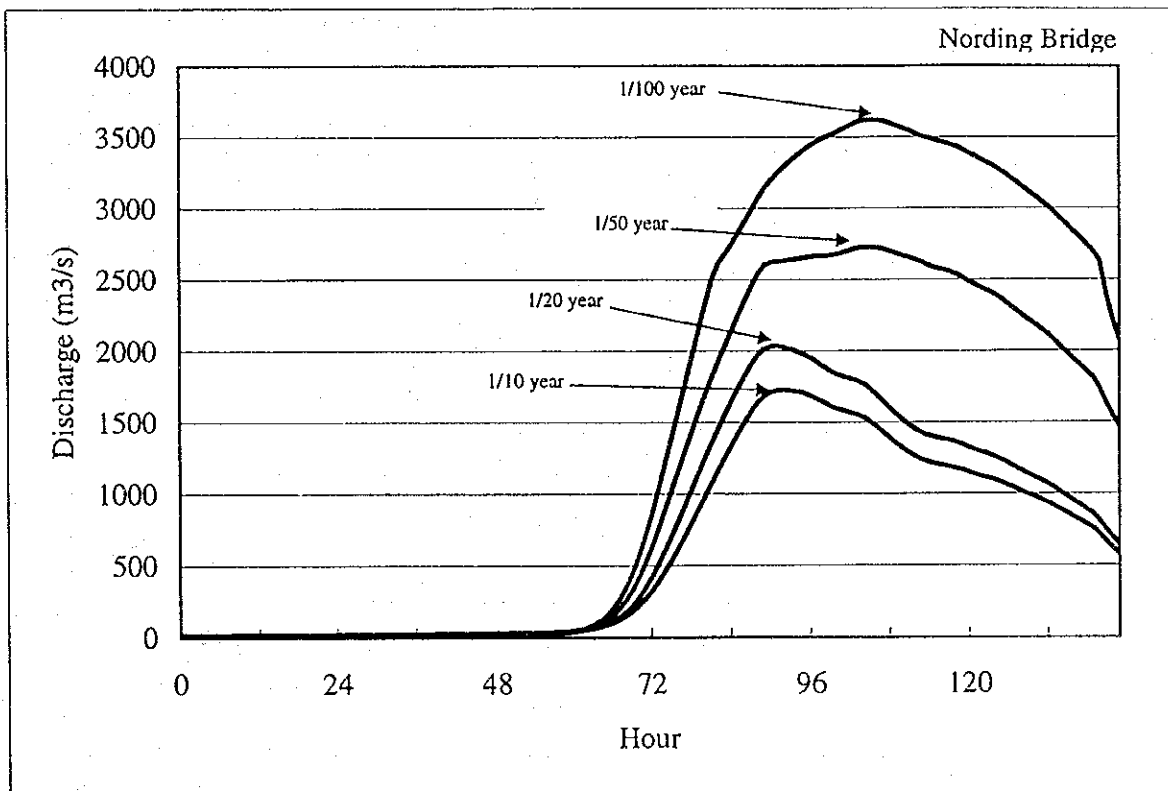
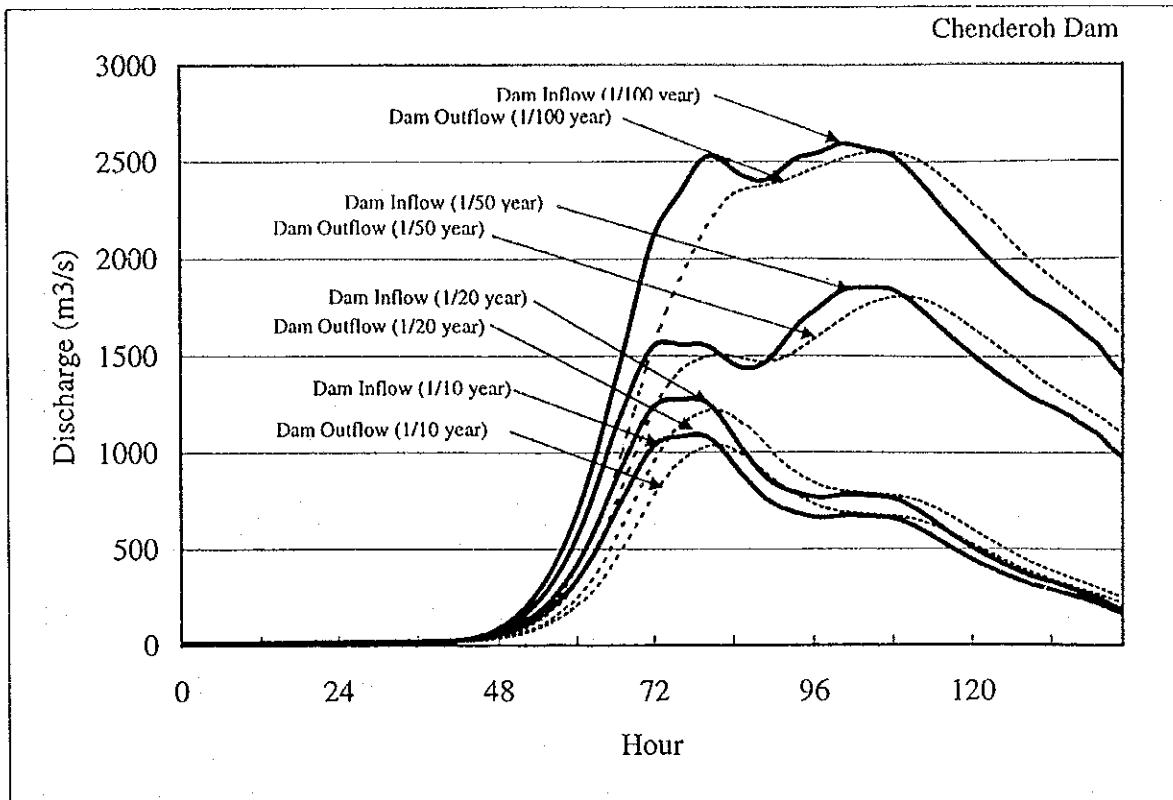


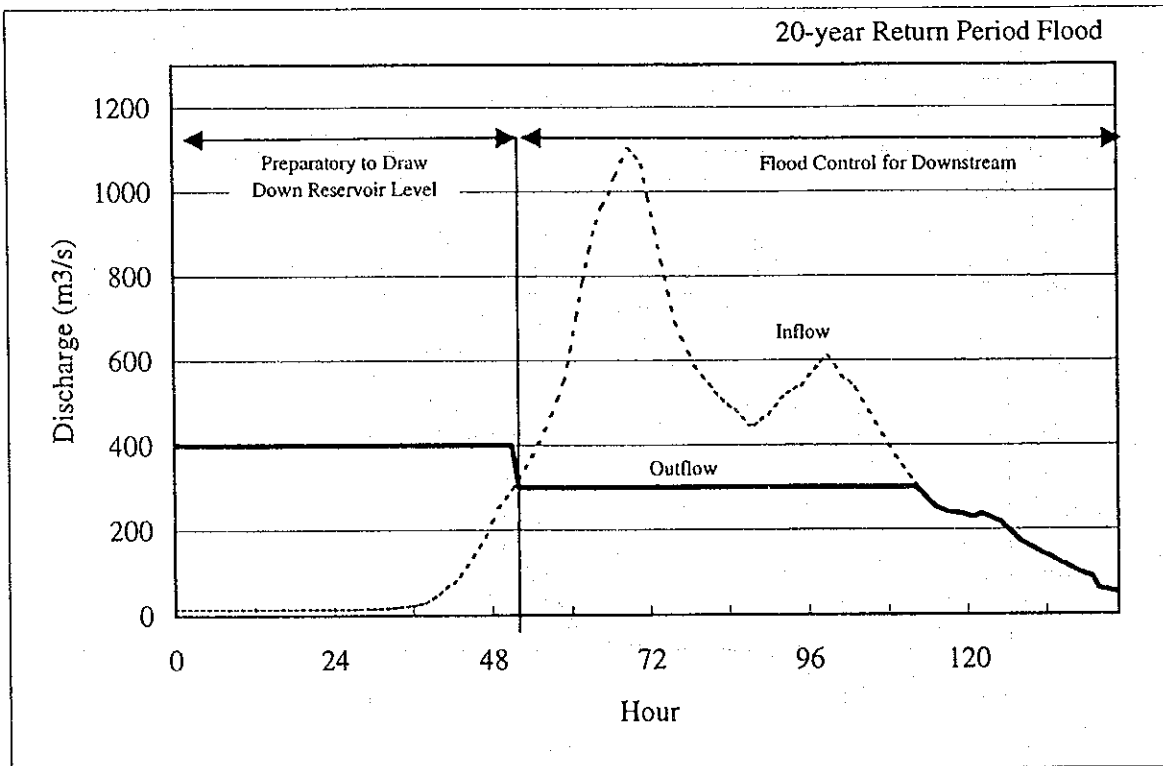
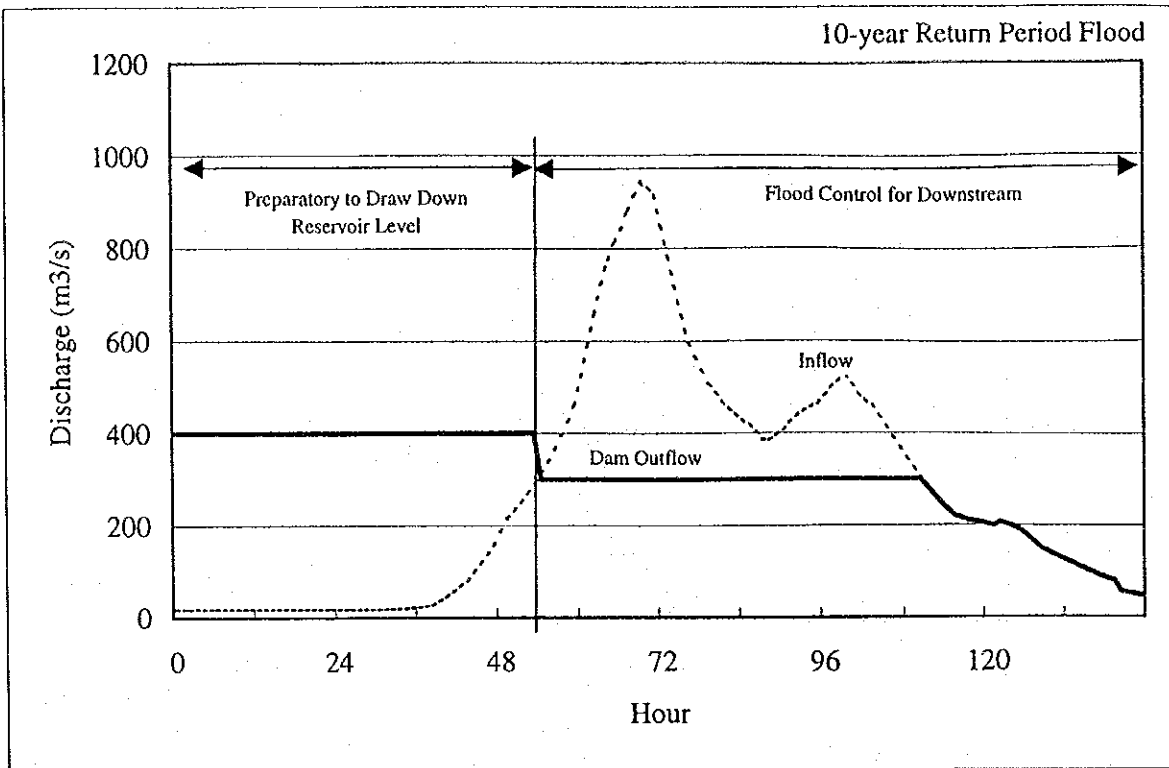
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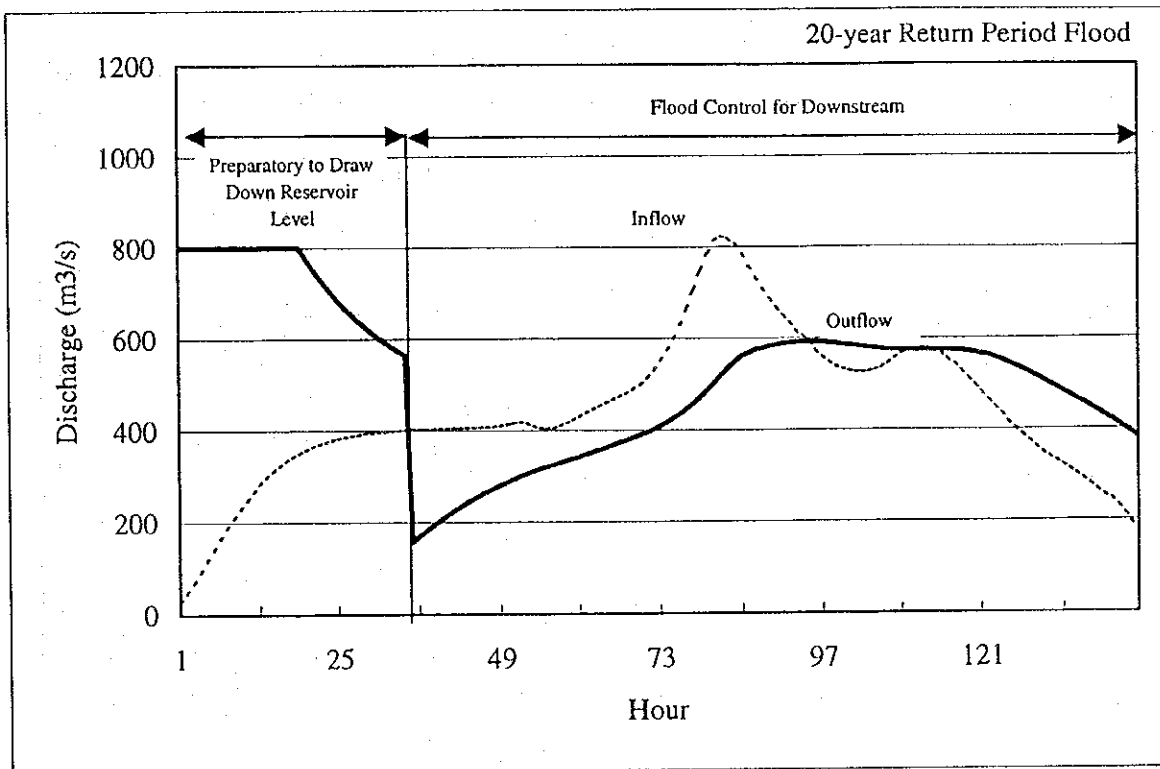
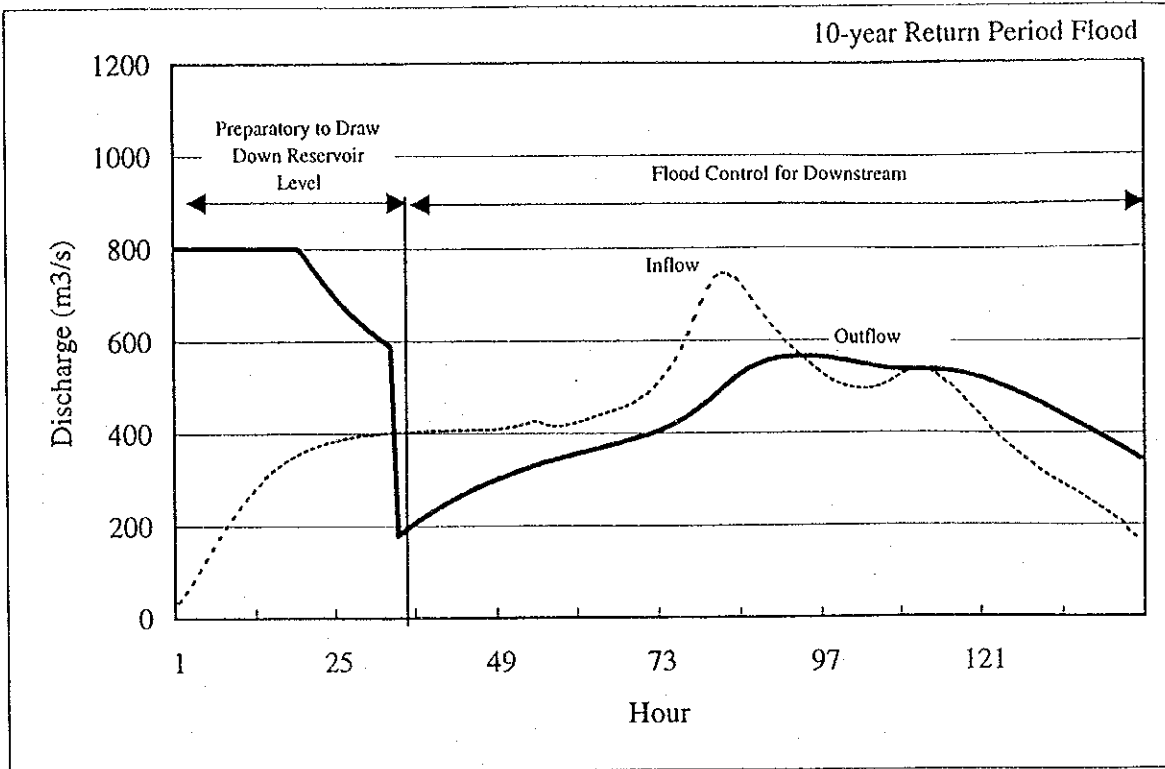
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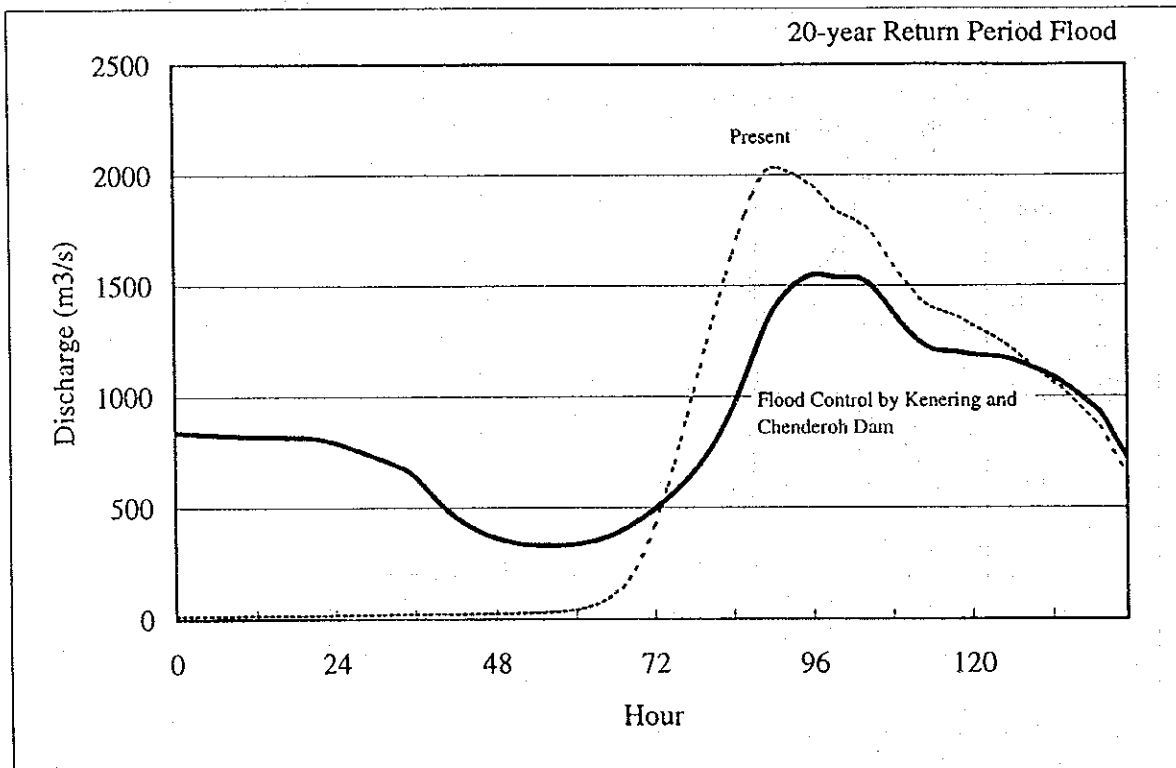
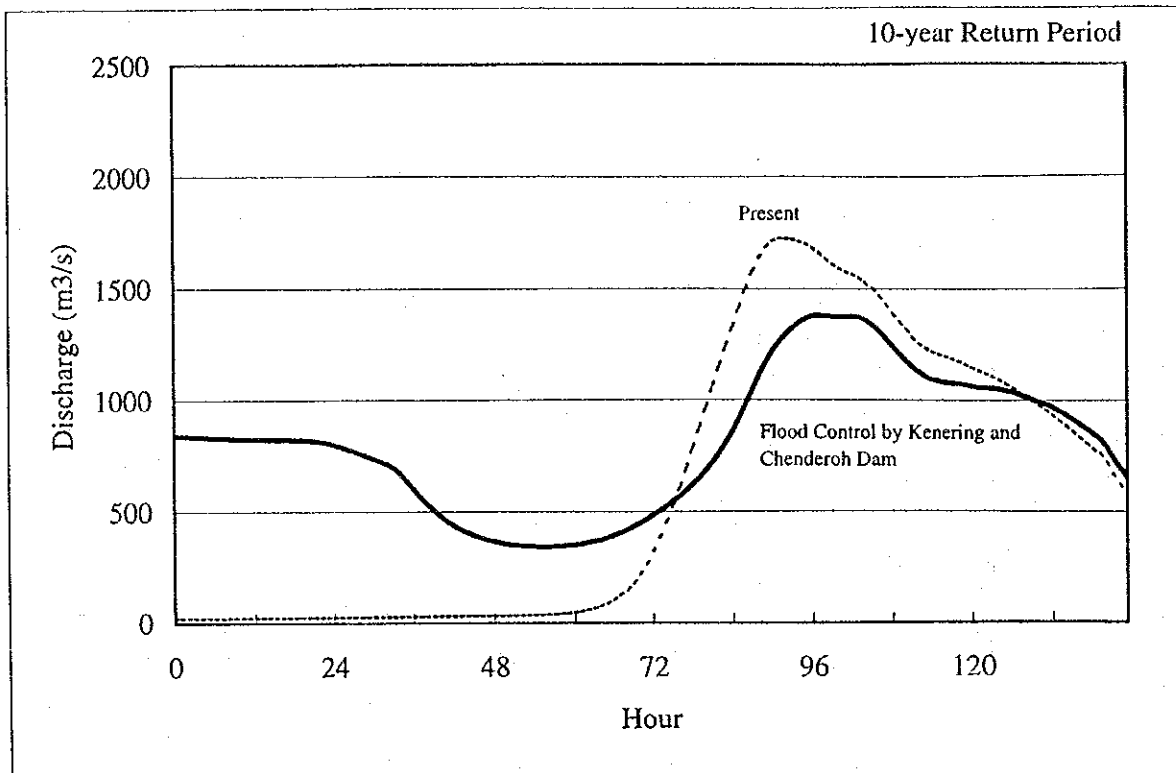
Fig. II-32 PROBABILITY OF ONE-MONTH
MINIMUM RUNOFF VOLUME FROM
PELUS RIVER IN AUGUST



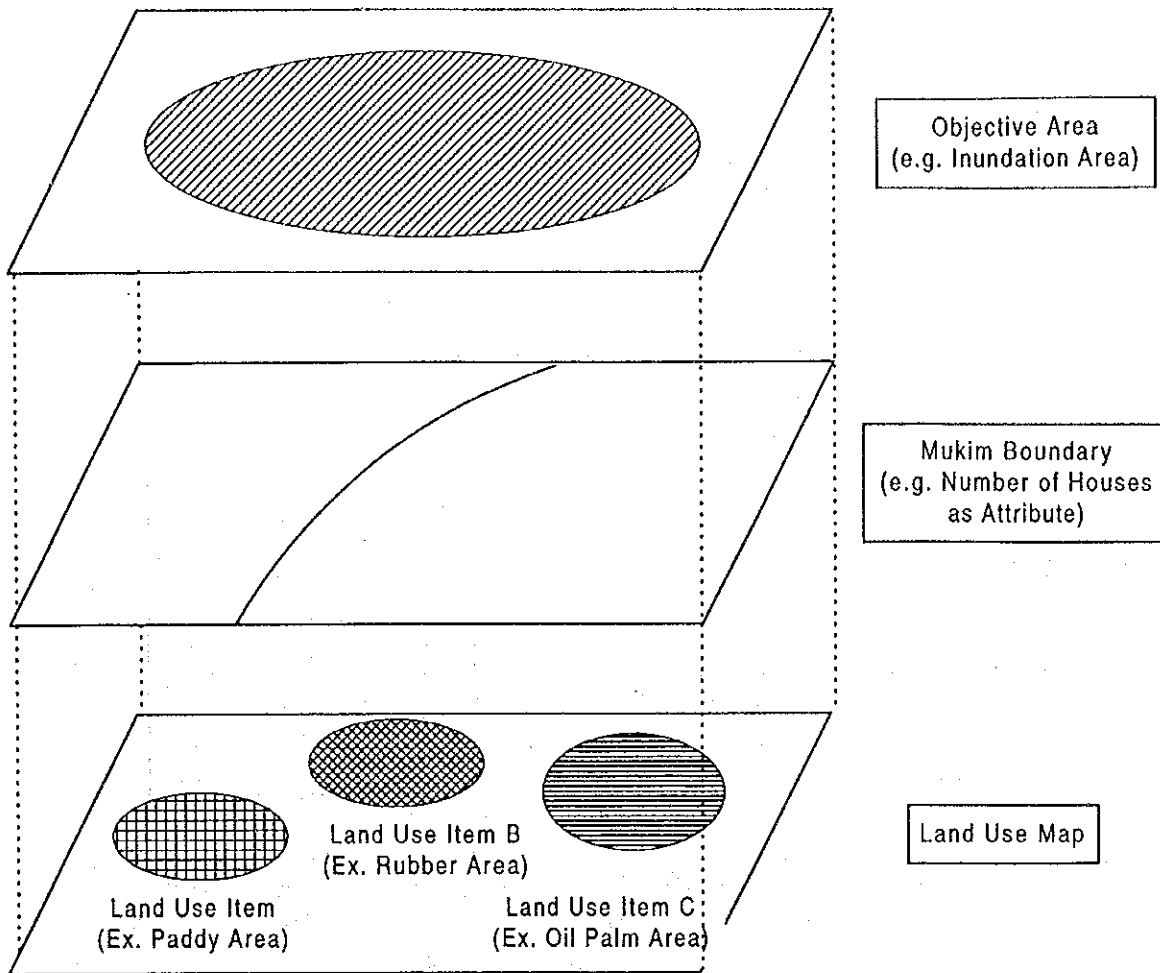








Conceptual Schematics of GIS Overlay



$$N_h = D_h(1) \times A_m(1) + D_h(2) \times A_m(2) + \dots + D_h(i) \times A_m(i) + \dots$$

$$D_n = N_h \times D_{hf} \times V_h$$

$$D_a = A_a(1) \times D_{af}(1) \times V_a(1) + A_a(2) \times D_{af}(2) \times V_a(2) + \dots + A_a(i) \times D_{af}(i) \times V_a(i) + \dots$$

where N_h : Total number of house in Flood Inundation Area

$D_h(i)$: Housing Density in Mukim i

$A_m(i)$: Area of Mukim i

D_n : Total housing damage value

D_{hf} : Damage factor of house

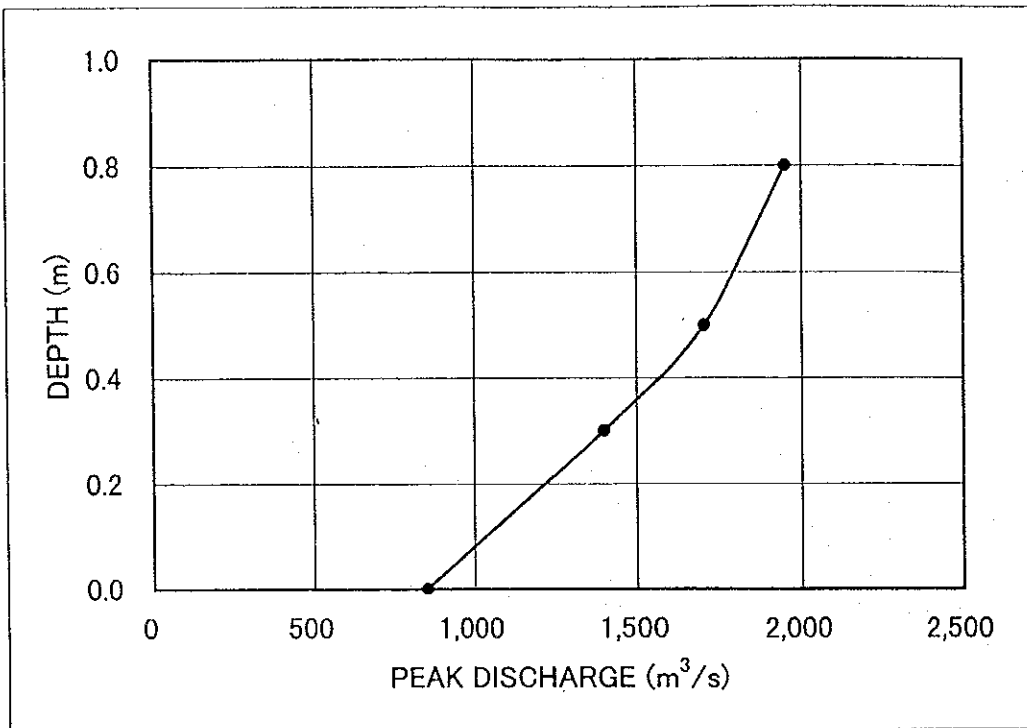
V_h : Unit value of house

D_a : Agricultural damage

A_a : Area of Agricultural land

D_{af} : Damage factor of agricultural crop

V_a : Unit value of agricultural crop



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Fig. II-38 RELATIONSHIP BETWEEN PEAK DIS-
CHARGE AT NORDING BRIDGE AND
MAX. FLOOD INUNDATION DEPTH