

Table I-40 Breakdown of Irrigation Water Requirement in Case 1 / Irrigation Duty (Besut River System)

Scheme : Besut		Area : 416 ha		Condition : Case 1	
Sub-Scheme : Besut Irrigation		Rainfall Station : 572906		Area : 113 ha	
Water Requirement		Rainfall (mm)		Evaporation (mm)	
Month (Days)	Jan	Jan	Feb	Jan	Feb
20	27.33	3.3	4.1	0.7	0.0
10	19.28	3.3	3.8	0.6	0.0
5	12.22	2.8	2.8	0.5	0.0
3	1.8	2.1	2.4	0.3	0.0
1	0.9	1.4	1.8	0.2	0.0
Irrigation Duty		Rainfall (mm)		Evaporation (mm)	
Month (Days)	Jan	Jan	Feb	Jan	Feb
20	24.03	4.0	4.8	0.0	0.0
10	16.88	4.0	3.5	0.0	0.0
5	10.82	3.5	2.9	0.0	0.0
3	6.86	2.9	2.4	0.0	0.0
1	3.90	2.1	1.8	0.0	0.0

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Table I-42 Breakdown of Irrigation Duty / Irrigation Water Requirement in Case 3 (Kerian Scheme)

Scheme : Kerian		Area : 23000 ha		Condition : Case 3															
Sub-Scheme : Kerian Darat, Kerian Laut		Area : 2403 ha		(Eff:45%, Present Cropping Pattern)															
<1> Compartment A																			
Water Requirement																			
Month/10days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual						
Return Period	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	Average
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Irrigation Duty																			
Diversion Point	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
<2> Compartment B																			
Water Requirement																			
Month/10days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual						
Return Period	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	Average
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
Irrigation Duty																			
Diversion Point	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
<3> Compartment C																			
Water Requirement																			
Month/10days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual						
Return Period	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	Average
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Irrigation Duty																			
Diversion Point	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
<4> Compartment D																			
Water Requirement																			
Month/10days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual						
Return Period	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	Average
20	3.4	1.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6
10	2.8	1.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3
5	2.3	1.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
4	2.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
3	1.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
2	1.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
Irrigation Duty																			
Diversion Point	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5

Table I-42 Breakdown of Irrigation Duty / Irrigation Water Requirement in Case 3 (Kerian Scheme)

Scheme : Kerian Area : 17560 ha Condition : Case 3
 Sub-Scheme : Kerian Darat, Kerian Laut (Eff:45%, Present Cropping Pattern)

<S> Total for Kerian Laut Sub-Scheme

Month/Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual Average			
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3							
Water Requirement	3.4	1.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Return Period	20	10	5	4	3	2	1.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Annual Average	10.4	8.9	7.3	6.8	6.0	5.2	4.5	3.5	2.6	1.7	0.8	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Injection Duty : 0.1 (m³/ha) Diversion Point : 0.1 (m³/ha)

<S> Compartment E

Month/Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual Average					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3									
Water Requirement	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Return Period	20	10	5	4	3	2	1.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Annual Average	0.6	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Injection Duty : 0.6 (m³/ha) Diversion Point : 0.6 (m³/ha)

<T> Compartment F

Month/Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual Average					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3									
Water Requirement	2.8	1.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Return Period	20	10	5	4	3	2	1.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Annual Average	1.5	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Injection Duty : 0.9 (m³/ha) Diversion Point : 0.9 (m³/ha)

<S> Compartment G

Month/Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual Average					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3									
Water Requirement	3.0	3.7	3.1	1.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Return Period	20	10	5	4	3	2	1.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Annual Average	2.4	2.2	2.0	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

Injection Duty : 0.9 (m³/ha) Diversion Point : 0.9 (m³/ha)

Table I-42 Breakdown of Irrigation Duty / Irrigation Water Requirement in Case 3 (Kerian Scheme)

Scheme : Kerian		Area : 21600 ha		Condition : Case 3												
Sub-Scheme : Kerian Darat, Kerian Laut		Area : 2650 ha		(Eff:45%, Prevent Cropping Pattern)												
Rainfall Station : 4009023																
<9> Compartment H																
Water Requirement																
Month/Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual			
Return Period	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	Average
20	4.7	4.9	4.4	2.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	3.9	4.0	3.7	2.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	3.2	3.2	3.0	1.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	2.9	2.9	2.7	1.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	2.5	2.5	2.4	1.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	2.0	1.9	1.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imigation Duty	0.9	0.9	0.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Discharge Point	0.7	0.6	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

		Area : 9834 ha														
<10> Total for Kerian Darat Sub-Scheme																
Water Requirement																
Month/Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual			
Return Period	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	Average
20	13.6	11.8	7.9	4.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	11.2	9.6	6.7	3.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	8.8	7.6	5.4	2.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	8.0	6.9	4.9	2.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	6.9	5.8	4.2	2.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	5.2	4.3	3.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imigation Duty	0.7	0.6	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Discharge Point	0.7	0.6	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

		Area : 21960 ha														
<11> Total for All Kerian Scheme																
Water Requirement																
Month/Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual			
Return Period	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	Average
20	17.0	13.5	8.0	4.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	14.0	11.1	6.8	3.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	11.1	9.4	5.5	2.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	10.1	8.0	5.0	2.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	8.7	6.8	4.2	2.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	6.6	5.1	3.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imigation Duty	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Discharge Point	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table I-51 Water Balance of Kerian River in Present Condition

Scheme : Kerian River : Kerian River Condition : Present Water Demand, Cropping Intensity 100%

<10> Qa (Case 3) = Qak + Water Supply from Reservoir in Case 3 (Overall Irrigation Efficiency = 60%, Proposed Cropping Pattern)

Table with columns for Month/10days (Jan to Dec) and Annual, containing water balance data for Case 3 in the present condition.

<11> Water Balance of Case 1

Water Balance >0 Excess Water Balance <0 Deficit (Overall Irrigation Efficiency = 45%, Present Cropping Pattern)

Table with columns for Month/10days (Jan to Dec) and Annual, containing water balance data for Case 1.

<12> Water Balance of Case 2

Water Balance >0 Excess Water Balance <0 Deficit (Overall Irrigation Efficiency = 60%, Present Cropping Pattern)

Table with columns for Month/10days (Jan to Dec) and Annual, containing water balance data for Case 2.

<13> Water Balance of Case 3

Water Balance >0 Excess Water Balance <0 Deficit (Overall Irrigation Efficiency = 60%, Proposed Cropping Pattern)

Table with columns for Month/10days (Jan to Dec) and Annual, containing water balance data for Case 3.

Table I-52 Water Balance of Batang Padang River in Present Condition

Scheme : Sungai Mamik River : Batang Padang River
 Sub-Scheme : Sungai Mamik, Labu Kubong Condition : Present Water Demand, Cropping Intensity 180%

<1> WR Case 1 (Overall Irrigation Efficiency = 45%, Present Cropping Pattern)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	2.7	3.3	9.8	11.6	12.0	15.8	16.2	14.8	9.7	11.5	11.4	11.2	10.4	12.8	12.2	9.8	6.7	4.2	2.5	4.3	8.3	9.7	11.3	12.8	15.9	14.7	11.3	11.2	10.4	10.8	8.0	2.9	6.8	6.6	5.3	3.5	9.7
10	2.1	3.1	9.6	11.0	11.4	14.9	14.9	13.2	8.6	10.1	9.8	9.3	8.7	10.6	10.3	8.1	5.7	3.6	2.1	4.2	8.1	9.2	10.7	12.2	14.8	15.2	10.1	9.8	8.8	9.0	6.5	6.5	5.5	5.3	4.3	2.8	8.6
5	1.6	2.9	9.2	10.4	10.8	13.9	13.5	11.5	7.5	8.2	7.4	6.9	6.4	8.4	8.4	6.4	4.6	3.1	1.7	4.0	7.2	8.7	10.1	11.4	13.6	11.0	8.5	8.3	7.1	7.2	5.0	4.9	4.1	3.9	3.2	2.0	7.4
4	1.4	2.9	9.2	10.2	10.5	13.5	13.0	10.9	7.0	8.0	7.5	6.7	6.3	7.6	7.7	5.8	4.2	2.9	1.5	4.0	7.6	8.5	9.8	11.1	13.1	11.0	7.9	7.7	6.5	6.6	4.5	4.4	3.6	3.4	2.9	1.8	7.0
3	1.1	4.8	9.0	9.8	10.1	12.9	12.3	10.0	6.4	7.2	6.8	5.9	5.5	6.6	6.8	5.1	3.7	2.6	1.3	3.9	7.4	8.2	9.4	10.6	12.5	10.2	7.1	6.9	5.7	5.8	3.8	3.7	3.0	2.8	2.4	1.4	6.5
2	0.7	4.6	8.7	9.3	9.5	12.0	11.1	8.7	5.5	6.1	5.5	4.5	4.3	4.9	5.4	3.8	2.9	2.2	1.0	3.7	7.1	7.7	8.8	9.8	11.3	8.9	5.9	5.7	4.4	4.5	2.7	2.7	2.0	1.8	1.6	0.9	5.6

<2> WR Case 2 (Overall Irrigation Efficiency = 60%, Present Cropping Pattern)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	2.0	4.0	7.4	8.7	9.0	11.9	12.2	11.1	7.3	8.6	8.6	8.4	7.8	9.6	9.2	7.4	5.0	3.2	1.9	3.2	6.2	7.3	8.3	9.6	11.9	11.0	8.6	8.4	7.8	8.1	6.0	5.9	5.1	5.0	4.0	2.6	7.3
10	1.6	3.8	7.2	8.3	8.6	11.2	11.2	9.9	6.5	7.6	7.4	7.0	6.5	8.0	7.7	6.1	4.3	2.7	1.6	3.2	6.1	6.9	8.0	9.2	11.1	9.9	7.6	7.4	6.6	6.8	4.9	4.9	4.1	4.0	3.2	2.1	6.5
5	1.2	3.7	7.0	7.8	8.3	10.4	10.1	8.6	5.6	6.4	6.1	5.6	5.2	6.3	6.3	4.8	3.5	2.3	1.3	3.0	5.8	6.5	7.6	8.6	10.2	8.7	6.4	6.2	5.3	5.4	3.8	3.7	3.1	2.9	2.4	1.5	5.6
4	1.1	3.7	6.9	7.7	7.9	10.1	9.8	8.2	5.3	6.0	5.6	5.0	4.7	5.7	5.8	4.4	3.2	2.2	1.1	3.0	5.7	6.4	7.4	8.3	9.8	8.3	5.9	5.8	4.9	5.0	3.4	3.3	2.7	2.6	2.2	1.4	5.3
3	0.8	3.6	6.8	7.4	7.6	9.7	9.2	7.5	4.8	5.4	5.1	4.4	4.1	5.0	5.1	3.8	2.8	2.0	1.0	2.9	5.6	6.2	7.1	8.0	9.4	7.7	5.3	5.2	4.3	4.4	2.9	2.8	2.3	2.1	1.8	1.1	4.8
2	0.5	3.5	6.3	7.0	7.1	9.0	8.3	6.5	4.1	4.6	4.1	3.4	3.2	3.7	4.1	2.9	2.2	1.7	0.8	2.8	5.3	5.8	6.6	7.4	8.5	6.7	4.4	4.3	3.3	3.4	2.0	2.0	1.5	1.4	1.2	0.7	4.2

<3> Qa (Available Water at Intake Point of the Study Area)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3						
20	14.7	14.9	14.6	13.4	14.9	17.8	12.6	12.4	13.2	13.0	17.2	13.9	17.5	23.1	20.2	14.7	14.3	12.0	11.4	9.7	16.2	13.0	13.0	9.7	9.1	9.8	12.9	14.9	22.0	23.1	19.0	28.4	21.6	19.7	19.4	19.3	17.8	15.8	
10	16.2	15.8	15.9	15.6	16.8	13.2	14.3	14.0	15.2	14.3	18.3	15.3	18.6	24.1	20.8	16.9	14.9	13.1	12.8	11.5	17.4	14.1	14.4	10.9	11.9	11.9	15.7	17.3	23.2	25.3	22.3	31.0	24.8	22.7	22.1	22.6	20.4	17.6	16.6
5	18.6	17.9	18.0	18.8	19.6	15.3	16.5	16.2	18.0	19.2	20.2	17.7	20.7	26.8	21.9	19.9	16.2	14.7	13.2	14.7	15.2	14.5	19.0	15.0	13.5	15.0	19.8	23.8	25.4	28.4	27.1	36.3	29.4	26.9	26.1	27.4	24.3	20.4	20.4
4	20.0	18.3	19.2	20.4	21.0	16.4	17.7	17.4	19.5	20.0	21.8	19.2	22.0	26.9	22.9	21.5	17.0	15.5	16.6	15.5	19.9	16.7	15.0	14.9	16.7	22.0	22.7	26.9	29.9	29.7	38.8	31.9	29.1	28.4	30.0	26.3	21.9	21.9	
3	22.0	19.7	20.9	22.8	23.0	17.8	19.3	19.0	21.6	21.2	23.8	21.3	23.9	28.3	24.2	23.6	18.1	16.7	18.4	17.5	21.2	18.0	16.7	16.9	19.1	25.3	25.2	28.9	32.0	33.3	42.4	35.3	32.2	31.6	33.6	29.1	24.0	24.0	
2	25.1	21.8	23.6	26.5	26.0	20.1	21.9	21.6	25.0	22.9	26.9	24.6	26.8	30.4	26.1	27.1	19.8	18.5	21.2	20.6	23.0	20.0	19.5	20.1	23.0	30.6	29.4	31.9	35.2	39.1	47.9	40.7	37.1	36.7	39.5	33.0	27.3		

Table I-52 Water Balance of Batang Padang River in Present Condition

Scheme : Sungai Manik River : Batang Padang River
 Sub-Scheme : Sungai Manik, Laba Kubong Condition : Present Water Demand, Cropping Intensity 100%

= Qa - WR Case 1
 Water Balance <0: Deficit (Overall Irrigation Efficiency = 45%, Present Cropping Pattern)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	12.0	9.6	4.8	1.8	2.9	-4.1	-3.6	-2.4	3.5	6.5	5.8	2.7	7.1	10.3	8.0	4.9	7.6	7.8	8.6	5.4	7.9	3.5	-1.6	-3.7	-6.1	-1.8	3.4	10.8	12.7	8.2	20.4	13.7	12.9	12.8	14.0	14.3	6.1
10	14.1	10.7	6.3	4.6	-1.7	-0.7	0.8	6.6	8.3	8.5	6.0	9.9	13.5	10.5	8.8	9.2	9.5	10.7	7.3	9.3	4.9	0.7	-1.3	-2.9	2.5	7.2	13.4	16.5	13.3	25.1	18.3	17.2	16.8	18.3	17.6	9.0	
5	17.0	12.4	8.7	6.4	8.3	1.4	3.0	4.7	10.6	10.7	12.2	10.3	13.8	17.4	13.5	11.6	11.6	13.6	10.1	11.3	7.1	3.6	-2.1	1.4	8.2	12.3	17.1	21.3	19.9	31.3	26.5	22.8	22.2	24.2	22.3	12.9	
4	18.6	13.4	10.0	10.2	10.5	2.9	4.7	6.5	12.5	12.0	14.3	12.5	15.7	19.3	15.2	12.8	12.6	15.1	11.5	12.3	8.2	5.2	3.8	3.6	11.0	14.8	19.2	23.4	23.1	34.3	27.5	25.5	25.0	27.1	24.5	14.8	
3	20.9	14.9	11.9	13.0	12.9	4.9	7.0	9.0	15.2	14.0	17.0	15.4	18.4	21.7	17.4	18.5	14.4	14.1	17.1	13.6	13.8	9.8	7.3	6.3	6.6	15.1	18.1	22.0	26.3	27.5	38.6	31.6	29.2	24.8	31.2	27.2	17.5
2	24.4	17.2	14.9	17.2	16.5	8.1	10.8	12.9	19.5	16.8	21.4	20.1	22.5	25.5	20.7	23.3	16.9	16.3	20.2	16.9	15.9	12.3	10.7	10.3	11.7	21.7	23.5	26.2	30.8	34.6	45.2	38.0	35.1	34.9	37.9	32.2	21.8

= Qa - WR Case 2
 Water Balance <0: Deficit (Overall Irrigation Efficiency = 60%, Present Cropping Pattern)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	12.6	11.0	7.2	4.7	5.9	-0.1	0.5	1.3	6.0	9.4	8.6	5.5	9.7	13.5	11.1	7.4	9.2	8.8	9.2	6.5	9.9	5.7	1.2	-0.5	-2.1	1.9	6.3	13.6	15.3	10.9	22.4	15.0	14.6	14.5	15.3	15.1	8.5
10	14.6	12.0	8.7	7.3	8.3	2.1	3.1	4.1	8.7	10.8	10.9	8.3	12.1	16.1	13.0	10.8	10.6	10.4	11.2	8.4	11.3	7.2	3.3	1.8	0.8	5.8	9.7	15.9	18.7	15.6	26.7	19.9	18.6	18.1	19.3	18.3	11.2
5	17.4	13.7	10.0	11.0	11.5	4.9	6.4	7.6	12.4	12.8	14.2	12.1	15.5	19.5	15.6	13.1	12.7	12.3	14.0	11.1	13.3	9.2	6.2	5.0	4.8	11.2	14.4	19.2	23.1	21.7	32.5	25.8	23.3	25.0	22.8	14.8	
4	19.0	14.7	12.3	12.8	13.1	6.2	8.0	9.2	14.2	14.0	16.1	14.2	17.3	21.2	17.1	17.1	13.8	13.3	15.4	12.5	14.2	10.3	7.6	6.6	6.9	13.8	16.7	21.1	25.0	24.7	35.5	28.6	26.4	25.8	27.8	24.9	16.6
3	21.2	16.1	14.2	15.4	15.4	8.1	10.1	11.5	16.8	15.8	18.7	16.9	19.8	23.4	19.1	19.8	15.3	14.7	17.4	14.6	15.6	11.9	9.7	8.9	9.7	17.6	19.9	23.7	27.7	28.9	39.5	32.5	30.0	29.5	31.8	28.1	19.1
2	24.6	18.4	17.1	19.6	18.9	11.1	13.5	15.1	20.9	19.3	22.7	21.3	23.6	26.8	22.1	24.2	17.6	16.8	20.5	17.9	17.7	14.2	12.9	12.7	14.6	23.9	26.9	27.6	31.9	35.7	45.8	38.6	35.6	35.4	38.3	32.9	23.2

Table I-53 Water Balance of Kemasin River in Present Condition

Scheme	: Kemasin / Semerak	River	: Kemasin River
Sub-Scheme	: Jelawat Rusa, Kemasin Hilir	Condition	: Present Water Demand

<1> WR Case 1 (Overall Irrigation Efficiency = 45%, Present Cropping Pattern)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	4.3	4.1	4.5	4.8	4.6	3.2	1.8	0.2	0.0	0.0	1.8	4.2	4.5	3.4	2.0	3.1	3.2	3.4	2.8	2.7	2.6	3.1	2.6	2.3	1.4	0.8	0.1	1.9	4.3	4.0	3.1	1.8	2.1	2.0	2.4	2.9	2.7
10	3.5	3.5	3.8	4.1	3.9	2.7	1.4	0.2	0.0	0.0	1.8	4.0	4.3	3.2	1.9	2.8	2.7	2.8	2.4	2.2	2.2	2.6	2.0	2.0	1.0	0.6	0.0	1.9	4.1	3.8	2.7	1.5	1.7	1.5	1.8	2.3	2.3
5	2.8	2.8	3.0	3.4	3.2	2.1	1.2	0.1	0.0	0.0	1.8	3.9	4.0	2.9	1.8	2.5	2.4	2.1	1.8	1.8	1.7	2.0	1.5	1.5	0.7	0.5	0.0	1.8	3.9	3.4	2.4	1.2	1.3	1.1	1.3	1.6	1.9
4	2.6	2.5	2.8	3.2	3.0	1.9	1.1	0.1	0.0	0.0	1.8	3.9	3.9	2.8	1.8	2.4	2.1	2.0	1.7	1.6	1.7	1.3	1.3	0.6	0.3	0.0	1.8	3.8	3.3	2.1	1.0	1.1	0.8	1.0	1.4	1.8	
3	2.3	2.3	2.4	2.9	2.7	1.6	1.0	0.1	0.0	0.0	1.8	3.8	3.8	2.7	1.7	2.2	2.0	1.6	1.4	1.4	1.3	1.5	1.1	1.2	0.5	0.2	0.0	1.8	3.7	3.2	1.9	0.7	0.7	0.6	0.7	1.1	1.6
2	1.7	1.8	2.0	2.4	2.1	1.2	0.7	0.1	0.0	0.0	1.7	3.7	3.6	2.6	1.5	1.9	1.6	1.2	1.1	1.1	1.0	1.0	0.7	0.8	0.2	0.1	0.0	1.7	3.4	2.8	1.5	0.2	0.2	0.1	0.3	0.7	1.3

<2> WR Case 2 (Overall Irrigation Efficiency = 60%, Present Cropping Pattern)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
20	3.2	3.1	3.4	3.6	3.5	2.4	1.4	0.2	0.0	0.0	1.4	3.2	3.4	2.6	1.5	2.3	2.4	2.0	2.1	2.0	2.0	2.3	2.0	1.7	1.1	0.6	0.1	1.4	3.2	3.0	2.3	1.4	1.6	1.5	1.8	2.2	2.0
10	2.6	2.6	2.9	3.1	2.9	2.0	1.1	0.2	0.0	0.0	1.4	3.0	3.2	2.4	1.4	2.1	2.0	2.1	1.8	1.7	1.7	2.0	1.5	1.5	0.8	0.5	0.0	1.4	3.1	2.9	2.0	1.1	1.3	1.1	1.4	1.7	1.7
5	2.1	2.1	2.3	2.6	2.4	1.6	0.9	0.1	0.0	0.0	1.4	2.9	3.0	2.2	1.4	1.9	1.8	1.6	1.4	1.4	1.3	1.5	1.1	1.1	0.5	0.4	0.0	1.4	2.9	2.6	1.8	0.7	1.0	0.8	1.0	1.2	1.4
4	2.0	1.9	2.1	2.4	2.3	1.4	0.8	0.1	0.0	0.0	1.4	2.9	2.9	2.1	1.4	1.8	1.6	1.5	1.3	1.2	1.2	1.3	1.0	1.0	0.5	0.2	0.0	1.4	2.9	2.5	1.6	0.8	0.8	0.6	0.8	1.1	1.3
3	1.7	1.7	1.8	2.2	2.0	1.2	0.8	0.1	0.0	0.0	1.4	2.9	2.9	2.0	1.3	1.7	1.5	1.2	1.1	1.1	1.0	1.1	0.8	0.9	0.4	0.2	0.0	1.4	2.8	2.4	1.4	0.5	0.5	0.5	0.5	0.8	1.2
2	1.3	1.4	1.5	1.8	1.6	0.9	0.5	0.1	0.0	0.0	1.3	2.8	2.7	2.0	1.1	1.4	1.2	0.9	0.8	0.8	0.8	0.8	0.5	0.6	0.2	0.1	0.0	1.3	2.6	2.1	1.1	0.2	0.2	0.1	0.3	0.5	1.0

<3> Qa (Available Water at Intake Point of the Study Area)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
20	7.8	7.0	7.3	6.7	6.6	6.0	6.4	5.7	6.0	5.8	5.5	5.3	5.6	6.1	6.6	6.9	6.4	6.8	7.1	6.7	6.1	7.2	7.9	6.5	7.4	6.9	6.9	7.2	6.9	7.2	8.1	7.2	13.8	8.2	7.3	6.9	
10	8.1	7.3	7.6	7.0	6.9	6.2	6.8	6.0	6.3	6.1	5.7	5.5	5.8	6.3	6.8	7.2	6.7	7.2	7.2	6.8	6.3	7.5	8.3	6.9	7.9	7.3	7.2	7.7	7.2	7.8	8.8	8.3	16.4	9.6	8.3	7.3	
5	8.5	7.8	8.1	7.4	7.4	6.6	7.3	6.5	6.8	6.6	6.1	6.6	7.2	7.7	7.4	7.9	7.5	7.4	7.9	7.5	7.2	6.6	7.9	8.9	7.5	8.0	8.0	7.8	8.4	7.8	10.0	10.3	21.5	12.2	9.9	8.1	
4	8.5	8.0	8.4	7.6	7.6	6.7	7.6	6.9	7.0	6.7	6.2	5.9	5.9	6.2	6.8	7.4	7.9	8.3	8.3	7.8	7.4	6.9	8.1	9.3	7.8	9.1	8.4	8.2	8.8	8.2	9.4	10.7	11.6	24.5	13.9	11.0	8.6
3	9.1	8.4	8.8	8.0	8.0	7.0	8.1	7.5	7.4	7.0	6.5	6.2	6.1	6.5	7.2	7.7	8.3	7.9	8.8	8.2	7.7	7.2	8.5	9.7	8.4	9.8	8.9	9.4	8.7	10.2	11.7	13.8	29.7	16.6	12.6	9.3	
2	9.5	9.0	9.4	8.5	8.5	7.5	8.9	8.5	8.1	7.6	6.9	6.7	6.7	6.9	7.7	8.2	8.8	8.5	9.8	8.7	8.3	7.8	9.0	10.4	9.3	10.8	9.8	9.7	10.3	9.6	11.7	13.4	18.1	39.4	21.7	18.8	10.5

Table I-53 Water Balance of Kemasin River in Present Condition

Scheme : Kemasin / Semerak River : Kemasin River
 Sub-Scheme : Jelawat Rusa, Kemasin Hill Condition : Present Water Demand

<4> Water Balance of Case 1 = Qa - WR Case 1
 Water Balance >0: Excess (Overall Irrigation Efficiency = 45%, Present Cropping Pattern)

Month/10days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	3.5	2.9	2.8	1.9	2.0	2.8	4.6	5.5	6.0	5.8	3.7	1.1	0.8	2.2	4.1	3.5	3.7	3.0	4.0	4.4	4.1	3.0	4.6	5.6	5.1	6.6	6.8	5.0	2.9	2.9	4.1	6.3	5.1	11.8	5.8	4.4	
10	4.6	3.8	3.8	2.9	3.0	3.5	5.4	5.8	6.3	6.1	3.9	1.5	1.2	2.6	4.4	4.0	4.5	3.9	4.8	5.0	4.6	3.7	5.5	6.3	5.9	7.3	7.3	5.3	3.6	3.4	5.1	7.3	6.6	14.9	7.8	6.0	
5	5.2	5.0	5.1	4.0	4.2	4.5	6.1	6.4	6.8	6.5	4.2	1.9	1.7	3.2	4.8	4.7	5.3	5.1	6.1	5.7	5.5	4.6	6.4	7.4	6.8	8.2	8.0	6.0	4.5	4.4	6.6	8.8	9.0	20.2	10.9	8.3	
4	6.2	5.5	5.6	4.4	4.6	4.8	6.5	6.8	7.0	6.7	4.4	2.0	2.0	3.4	5.0	5.0	5.8	5.5	6.6	6.2	5.8	5.2	6.8	8.0	7.2	8.8	8.4	6.4	5.0	4.9	7.3	9.7	10.5	23.7	12.9	9.6	
3	6.8	6.1	6.4	5.1	5.3	5.4	7.1	7.4	7.4	7.0	4.7	2.4	2.3	3.8	5.5	5.5	6.3	6.3	7.4	6.8	6.4	5.7	7.4	8.5	7.9	9.6	8.9	6.9	5.7	5.5	8.3	11.0	13.1	29.1	15.9	11.5	
2	7.8	7.2	7.4	6.1	6.4	6.3	8.2	8.4	8.1	7.6	5.2	3.1	4.3	6.2	8.3	7.2	7.3	6.7	7.6	7.3	6.8	6.3	9.6	9.1	10.7	9.8	8.0	6.9	6.8	6.8	10.2	13.2	17.9	39.3	21.4	15.1	

<5> Water Balance of Case 2 = Qa - WR Case 2
 Water Balance >0: Excess (Overall Irrigation Efficiency = 60%, Present Cropping Pattern)

Month/10days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	4.6	3.9	3.9	3.1	3.2	3.6	5.1	5.5	6.0	5.8	4.2	2.2	1.9	3.1	4.6	4.2	4.5	3.9	4.7	5.1	4.7	3.8	5.3	6.2	5.4	6.8	6.8	5.5	4.0	3.9	4.9	6.7	5.6	12.3	6.4	5.1	
10	5.5	4.7	4.8	3.9	4.0	4.2	5.7	5.8	6.3	6.1	4.4	2.5	2.2	3.4	4.8	4.7	5.2	4.6	5.4	5.6	5.2	4.4	6.0	6.8	6.1	7.5	7.3	5.8	4.6	4.4	5.8	7.7	7.0	15.3	8.3	6.5	
5	6.4	5.7	5.9	4.9	5.0	5.0	6.4	6.5	6.8	6.5	4.7	2.8	2.7	3.9	5.2	5.3	5.9	5.6	6.5	6.2	5.9	5.1	6.8	7.8	7.0	8.3	8.0	6.5	5.5	5.2	7.0	9.1	9.3	20.5	11.3	8.7	
4	6.8	6.2	6.3	5.2	5.4	5.3	6.8	6.8	7.0	6.7	4.9	3.0	3.0	4.1	5.5	5.6	6.4	6.0	7.0	6.6	6.2	5.6	7.1	8.3	7.4	8.9	8.4	6.8	6.0	5.7	7.8	9.9	10.8	23.9	13.1	9.9	
3	7.3	6.7	7.0	5.8	5.9	5.8	7.4	7.4	7.4	7.4	5.1	3.3	3.3	4.4	5.9	6.1	6.8	6.7	7.8	7.1	6.8	6.1	7.6	8.8	8.0	9.6	8.9	7.4	6.6	6.3	8.8	11.1	13.5	29.3	16.0	11.8	
2	8.2	7.7	7.9	6.7	6.9	6.6	8.4	8.5	8.1	7.6	5.7	3.9	4.0	5.9	6.6	6.8	7.6	7.6	9.0	7.9	7.6	7.1	8.5	9.8	9.2	10.7	9.8	8.4	7.8	7.5	10.6	13.2	18.0	39.3	21.5	15.3	

Table I-54 Water Balance of Besut River in Present Condition

Scheme: Besut River : Besut River
Sub-Scheme: Besut Barrage Condition: Present Water Demand

Table with columns: Month/Days, Return Period, and monthly water balance data (Jan-Dec) for Qa/CC3. Includes annual totals for surplus and deficit.

<5> Water Balance of Case 1 = Qa - WR Case 1 (Overall Irrigation Efficiency = 45%, Present Cropping Pattern)

Table showing monthly and annual water balance data for Case 1 (45% efficiency). Columns include months and return periods.

<6> Water Balance of Case 2 = Qa - WR Case 2 (Overall Irrigation Efficiency = 60%, Present Cropping Pattern)

Table showing monthly and annual water balance data for Case 2 (60% efficiency). Columns include months and return periods.

<7> Water Balance of Case 3 = Qa - WR Case 3 (Overall Irrigation Efficiency = 60%, Proposed Cropping Pattern)

Table showing monthly and annual water balance data for Case 3 (60% efficiency, proposed cropping). Columns include months and return periods.

Table I-55 Water Balance of Angga River in Present Condition

Scheme : Besut River : Angga River
 Sub-Scheme : Angga Barrage Condition : Present Water Demand

<5> Water Balance of Case 1 = Qa - WR Case 1
 Water Balance <0: Deficit (Overall Irrigation Efficiency = 45%, Present Cropping Pattern)

Month/10days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
20	6.9	3.5	0.2	-2.1	-2.4	-2.8	-3.1	-2.1	-0.2	1.3	1.3	-0.5	-3.4	0.3	0.4	-1.2	-0.5	-1.1	-1.0	-0.4	-0.9	-0.3	-0.3	0.0	3.0	3.9	2.4	2.5	2.6	0.5	2.8	10.0	7.3	8.3	1.0		
10	8.2	5.0	2.0	-0.8	-1.4	-1.9	-1.8	-2.1	-1.2	0.4	1.6	1.7	-0.2	-2.8	0.8	0.9	-0.6	0.1	-0.3	-0.1	0.4	0.1	0.5	0.5	1.0	3.8	4.6	3.3	3.2	3.5	2.0	5.4	11.8	9.2	10.2		
5	10.3	7.0	4.6	1.3	0.0	-0.7	-0.3	-0.7	0.0	1.3	2.2	2.3	0.3	-1.9	1.8	0.2	0.8	1.0	1.1	1.6	1.2	1.7	1.9	2.6	5.3	5.8	4.8	4.4	5.1	5.1	4.8	9.9	15.7	13.1			
4	11.8	7.9	6.0	2.1	0.7	-0.2	0.4	0.1	0.5	1.7	2.5	2.6	0.5	-1.8	1.8	2.3	0.7	1.2	1.6	1.8	2.2	1.9	2.3	2.6	3.4	6.3	6.7	5.6	5.0	6.0	6.2	6.3	12.5	18.8	16.1		
3	13.7	9.3	8.2	3.6	1.7	0.6	1.7	1.1	1.4	2.4	2.9	3.0	0.9	-0.8	2.4	3.0	1.4	1.7	2.5	2.9	3.0	2.9	3.2	3.7	4.7	7.8	7.8	6.9	6.0	7.5	7.9	8.9	16.5	23.5	20.6		
2	16.9	11.3	12.1	6.4	3.6	2.0	3.9	3.1	2.7	3.4	3.4	3.8	1.5	0.3	3.2	4.0	2.5	2.5	4.2	4.6	4.5	4.4	4.8	5.8	7.1	10.2	9.8	9.1	7.7	10.0	11.0	13.2	23.6	32.0	29.0		

<6> Water Balance of Case 2 = Qa - WR Case 2
 Water Balance <0: Deficit (Overall Irrigation Efficiency = 60%, Present Cropping Pattern)

Month/10days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
20	7.5	4.3	1.0	-1.2	-1.6	-1.9	-2.0	-2.2	-1.3	0.2	1.4	1.3	0.0	-2.3	0.7	0.8	-0.6	0.1	-0.6	-0.5	0.1	-0.4	0.1	0.0	0.3	3.3	4.0	2.5	2.5	2.6	1.1	3.9	10.5	7.4	8.2		
10	8.7	5.7	2.7	0.0	-0.6	-1.2	-1.0	-1.3	-0.5	0.7	1.7	1.7	0.3	-1.8	1.2	1.0	0.0	0.6	0.2	0.3	0.8	0.5	0.9	0.9	1.3	4.1	4.7	3.3	3.2	3.5	2.6	6.5	12.3	9.3	10.6		
5	10.7	7.5	5.1	1.7	0.6	-0.1	0.3	0.6	0.6	1.5	2.3	2.3	0.8	-0.9	1.9	2.1	0.6	1.3	1.3	1.5	1.9	1.6	2.0	2.8	3.5	5.9	6.8	4.6	5.1	5.1	5.2	10.9	16.1	13.2			
4	12.0	8.4	6.6	2.7	1.3	0.4	1.0	0.7	1.1	2.0	2.5	2.6	1.1	-0.5	2.2	2.6	1.3	1.6	1.9	2.2	2.5	2.2	2.6	3.0	3.6	6.5	6.8	5.6	5.0	6.0	6.2	6.8	13.4	19.1	16.2		
3	13.9	9.7	8.7	4.1	2.3	1.1	2.3	1.7	1.9	2.6	2.9	3.0	1.5	0.2	2.7	3.3	1.9	2.1	2.8	3.2	3.3	3.1	3.5	4.0	4.9	7.9	7.9	6.9	6.0	7.5	7.9	9.4	17.3	23.8			
2	17.0	11.6	12.5	6.9	4.0	2.4	4.6	3.6	3.1	3.6	3.5	3.8	2.0	1.2	3.5	4.3	3.0	2.8	4.4	4.9	4.8	4.7	5.0	6.0	7.2	10.3	9.8	9.1	7.7	10.0	11.0	14.2	24.4	32.2			

<7> Water Balance of Case 3 = Qa - WR Case 3
 Water Balance <0: Deficit (Overall Irrigation Efficiency = 60%, Proposed Cropping Pattern)

Month/10days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
20	7.3	4.2	1.2	0.2	0.9	0.7	0.7	-1.0	-1.3	-0.4	-0.2	-1.1	-0.4	-1.0	0.3	-0.1	-0.4	0.2	-0.6	-0.2	0.4	0.7	1.5	1.5	1.5	2.4	1.2	1.0	1.6	0.9	1.1	1.9	6.1	10.7	6.5		
10	8.4	5.7	2.8	1.2	1.5	1.1	1.3	-0.4	-0.8	0.1	0.2	-0.6	0.1	-0.3	0.9	0.6	0.3	0.8	0.1	0.6	1.2	1.4	2.0	2.2	2.2	3.0	1.8	2.0	2.4	2.0	2.3	3.5	8.7	12.6	8.5		
5	10.4	7.2	5.4	2.8	2.4	1.7	2.3	0.5	0.0	0.9	0.7	0.1	-0.8	0.7	1.7	1.5	1.3	1.7	2.3	2.3	2.5	2.5	3.3	3.5	4.3	5.1	3.5	3.6	3.8	4.3	6.3	13.0	16.5	12.5			
4	11.8	8.4	6.7	3.8	2.9	2.1	2.9	1.1	0.4	1.2	1.0	0.5	1.1	1.2	2.1	2.3	1.8	1.9	1.9	2.4	2.9	2.9	3.4	3.9	4.3	5.2	4.0	4.4	4.3	4.7	5.3	7.9	15.6	19.6			
3	13.7	9.7	8.8	5.2	3.7	2.6	3.9	1.9	1.1	1.9	1.4	0.9	1.5	1.9	2.7	3.1	2.5	2.3	2.7	3.4	3.6	3.8	4.2	4.9	5.4	6.7	5.2	5.7	6.3	7.1	10.5	19.4	24.3				
2	16.9	11.6	12.7	7.7	5.3	3.6	5.8	3.7	2.5	2.8	2.0	1.8	2.3	3.1	3.6	4.3	3.7	3.1	4.3	5.0	5.1	5.1	5.5	6.7	7.6	8.9	7.3	8.0	7.1	9.0	10.4	15.2	26.2				

Table I-57 Water Balance of Batang Padang River in Future Condition (2010)

Scheme : Sungai Mamik River : Batang Padang River
 Sub-Scheme : Sungai Mamik, Labu Kubong Condition : Future Water Demand, Cropping Intensity 180%

<1> WR Case 1 (Overall Irrigation Efficiency = 45%, Present Cropping Pattern)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	2.7	5.3	9.8	11.6	12.0	15.8	16.2	14.8	11.5	11.4	11.2	10.4	12.8	12.2	9.8	6.7	4.2	2.5	4.3	8.3	9.7	11.3	12.8	15.9	14.7	11.5	11.2	10.4	10.8	8.0	7.9	6.8	6.6	5.3	3.5	9.7	
10	2.1	5.1	9.6	11.0	11.4	14.9	13.2	10.6	10.3	8.1	5.7	3.6	2.1	4.2	8.1	9.2	10.7	12.2	14.8	13.2	10.1	9.8	8.8	9.0	6.5	6.5	5.5	5.3	4.3	2.8	8.6	5.5	5.3	4.3	2.8	8.6	
5	1.6	4.9	9.3	10.4	10.8	13.9	11.5	7.4	8.5	8.1	7.4	5.9	6.4	6.4	4.6	3.1	3.7	4.0	7.7	10.2	11.4	13.6	11.6	8.5	7.1	7.2	5.0	4.9	4.1	3.9	3.2	2.0	2.0	2.0	1.4	7.4	
4	1.4	4.9	9.2	10.2	10.5	13.0	10.9	7.0	8.0	7.5	6.7	5.3	7.6	7.7	5.8	4.2	2.9	1.5	4.0	7.6	8.5	9.8	11.1	13.1	11.0	7.9	7.7	6.5	6.6	4.5	4.4	3.6	3.4	2.9	1.8	7.0	
3	1.1	4.8	9.0	9.8	10.1	12.9	12.3	10.0	6.4	7.2	6.8	5.9	5.5	6.6	6.8	5.1	3.7	2.6	1.3	3.9	7.4	8.2	9.4	10.6	12.5	10.2	7.1	6.9	5.7	5.8	3.8	3.7	3.0	2.8	2.4	1.4	6.5
2	0.7	4.6	8.7	9.3	9.5	12.0	11.1	8.7	5.5	6.1	5.5	4.5	4.3	4.9	5.4	3.8	2.9	2.2	1.0	3.7	7.1	7.7	8.8	9.8	11.3	8.9	5.9	5.7	4.4	4.5	2.7	2.7	2.0	1.8	1.6	0.9	5.5

<2> WR Case 2 (Overall Irrigation Efficiency = 60%, Present Cropping Pattern)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	2.0	4.0	7.4	8.7	9.0	11.9	12.2	11.1	7.3	8.6	8.6	8.4	7.8	9.6	9.2	7.4	5.0	3.2	1.9	3.2	6.2	7.3	8.5	9.6	11.9	11.0	8.6	8.4	7.8	8.1	6.0	5.9	5.1	5.0	4.0	2.6	7.3
10	1.6	3.8	7.2	8.3	8.6	11.2	11.2	9.9	6.5	7.6	7.4	7.0	6.5	8.0	7.7	6.1	4.3	2.7	1.6	3.2	6.1	6.9	8.0	9.2	11.1	9.9	7.6	7.4	6.6	6.8	4.9	4.9	4.1	4.0	3.2	2.1	6.5
5	1.2	3.7	7.0	7.8	8.1	10.4	10.1	8.6	5.6	6.4	6.1	5.6	5.2	6.3	6.3	4.8	3.5	2.3	1.2	3.0	5.8	6.5	7.6	8.6	10.2	8.7	6.4	6.2	5.3	5.4	3.8	3.7	3.1	2.9	2.4	1.5	5.6
4	1.1	3.7	6.9	7.7	7.9	10.1	9.8	8.2	5.3	6.0	5.6	5.0	4.7	5.7	5.8	4.4	3.2	2.2	1.1	3.0	5.7	6.6	7.4	8.3	9.8	8.3	5.9	5.8	4.9	5.0	3.4	3.3	2.7	2.6	2.2	1.4	5.3
3	0.8	3.6	6.8	7.4	7.6	9.7	9.2	7.5	4.8	5.4	5.1	4.4	4.1	5.0	5.1	3.8	2.8	2.0	1.0	2.9	5.6	6.2	7.1	8.0	9.4	7.7	5.3	5.2	4.3	4.4	2.9	2.8	2.3	2.1	1.8	1.1	4.8
2	0.5	3.5	6.5	7.0	7.1	9.0	8.3	6.5	4.1	4.6	4.1	3.4	3.2	3.7	4.1	2.9	2.2	1.7	0.8	2.8	5.3	5.8	6.6	7.4	8.5	6.7	4.4	4.3	3.3	3.4	2.0	2.0	1.5	1.2	1.2	0.7	4.2

<3> qa (Available Water at Intake Point of the Study Area)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	14.1	14.4	14.0	12.9	14.3	11.2	12.1	11.9	12.7	17.5	16.6	17.4	17.0	22.6	19.7	14.2	13.7	11.5	10.5	9.2	15.6	12.4	9.2	8.6	9.3	12.4	14.4	21.5	22.6	18.5	27.8	21.0	19.2	18.9	18.7	17.2	15.3
10	15.7	15.3	15.3	15.1	16.3	12.7	13.7	13.5	14.6	17.8	17.7	14.8	18.1	23.6	20.2	16.3	14.4	12.5	12.3	11.0	16.8	13.5	10.8	10.4	11.3	15.1	16.8	22.7	24.8	21.8	31.1	24.3	22.1	21.5	20.0	19.9	17.1
5	18.1	16.8	17.4	18.2	19.0	14.8	16.0	15.7	17.4	18.7	19.8	17.2	20.1	25.2	21.4	19.3	15.6	14.1	14.7	13.6	18.5	15.2	13.2	13.0	14.5	19.2	20.3	24.9	27.8	26.6	35.8	26.9	26.4	25.5	26.9	23.7	19.8
4	19.5	17.8	18.7	19.9	20.4	15.8	17.2	16.9	19.0	19.5	21.2	18.7	21.5	26.3	22.1	20.9	16.5	15.0	10.0	15.0	19.4	16.2	14.4	14.4	16.1	21.5	22.1	26.3	29.4	29.1	38.3	31.3	28.6	27.8	29.4	25.8	21.3
3	21.5	19.2	20.4	22.2	22.4	17.3	18.8	18.5	21.1	20.6	23.2	20.8	23.4	27.8	23.6	23.1	17.6	16.2	17.8	17.0	20.6	17.5	16.2	16.3	18.6	24.7	24.7	28.3	31.5	32.7	41.8	34.7	31.7	31.0	33.1	28.6	22.5
2	24.6	21.3	23.1	24.0	25.5	19.5	19.5	21.3	24.4	22.3	26.3	24.1	26.3	29.9	25.6	26.6	19.3	18.0	20.7	20.1	22.5	19.5	19.0	19.5	22.5	30.0	28.8	31.4	34.7	38.5	47.3	40.1	36.6	36.2	38.9	33.0	26.8

Table I-57 Water Balance of Batang Padang River in Future Condition (2010)

Scheme : Sungai Manik River : Batang Padang River
 Sub-Scheme : Sungai Manik, Labu Kubong Condition : Future Water Demand, Cropping Intensity 180%

(Overall Irrigation Efficiency = 45%, Present Cropping Pattern)

<4> Water Balance of Case 1
 Water Balance >0: Excess

Month/10days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	11.4	9.1	4.2	1.3	2.3	-4.6	-4.1	-2.9	3.0	6.0	5.2	2.2	6.6	9.8	7.5	4.4	7.0	7.3	8.0	4.9	7.3	2.7	2.1	-4.2	-6.6	-2.3	2.9	10.3	12.2	7.7	19.8	13.1	12.4	12.3	13.4	13.7	5.6
10	13.6	10.2	5.7	4.1	4.9	-2.2	-1.2	0.3	6.0	7.7	7.9	5.1	9.4	13.0	9.9	8.2	8.7	8.9	10.2	6.8	8.7	4.3	0.1	-1.8	-3.5	1.9	6.7	12.9	16.0	12.8	24.6	17.8	16.6	16.2	17.7	17.1	8.5
5	16.5	11.9	8.1	7.8	8.2	-0.9	2.3	4.2	10.0	10.2	11.7	9.8	13.2	16.9	13.0	12.9	11.0	11.0	13.0	9.6	10.8	6.5	3.1	1.6	0.9	2.6	11.2	16.6	20.7	19.4	30.8	24.0	22.3	21.6	21.7	21.2	12.4
4	18.1	12.9	9.5	9.7	9.9	2.3	4.2	6.0	12.0	11.5	13.7	12.0	15.2	18.7	14.6	15.1	12.9	12.1	14.5	11.8	7.7	4.6	3.3	3.0	10.5	14.2	18.6	22.9	22.5	33.8	26.9	25.0	24.4	24.5	24.0	14.3	
3	20.4	14.4	11.4	12.4	12.3	4.4	6.5	8.5	14.7	13.4	16.4	14.9	17.9	21.2	16.8	18.0	13.9	13.6	16.5	13.1	13.2	9.3	6.8	5.7	6.1	14.5	17.6	21.4	25.8	26.9	38.0	31.0	28.7	28.2	30.7	27.2	17.0
2	23.9	16.7	14.4	16.7	16.0	7.5	10.2	12.3	18.9	16.2	20.8	19.6	22.0	25.0	20.2	22.8	16.4	15.8	19.7	16.4	15.4	11.8	10.2	9.7	11.2	21.1	22.9	25.2	30.3	34.0	44.6	37.4	34.4	34.4	37.3	32.1	21.2

(Overall Irrigation Efficiency = 60%, Present Cropping Pattern)

<5> Water Balance of Case 2
 Water Balance >0: Excess

Month/10days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	12.1	10.4	6.7	4.2	5.3	-0.6	-0.1	0.8	5.4	8.8	8.1	5.0	9.2	13.0	10.5	6.9	8.7	8.3	8.7	6.0	9.4	5.1	0.7	-1.0	-2.7	1.3	5.7	13.1	14.8	10.4	21.8	15.1	14.1	13.9	14.7	14.6	8.0
10	14.1	11.4	8.1	6.8	7.7	1.5	2.5	3.6	8.2	10.2	10.4	7.8	11.5	15.6	12.5	10.2	10.1	9.8	10.7	7.8	10.7	6.6	2.8	1.2	0.2	5.2	9.2	15.3	18.2	15.0	26.2	19.4	18.0	17.5	18.8	17.8	10.6
5	16.9	13.1	10.5	9.4	10.9	4.3	5.9	7.1	11.9	12.3	13.7	11.6	14.9	19.0	15.1	14.2	12.2	11.8	12.5	10.6	12.7	8.7	5.6	4.4	3.5	10.5	13.9	18.7	22.5	21.2	32.0	25.2	23.2	22.6	24.5	22.2	14.2
4	18.4	14.1	11.8	12.2	12.6	5.7	7.4	8.7	13.7	13.5	15.6	13.6	16.4	20.6	16.6	16.6	13.3	12.8	14.9	12.0	13.7	9.8	7.1	6.0	6.3	13.2	16.2	20.6	24.5	24.2	34.9	28.0	25.9	25.3	27.2	24.4	16.1
3	20.6	15.6	13.6	14.9	14.8	7.6	9.6	11.0	16.3	15.2	18.1	16.3	19.3	22.8	18.5	19.3	14.8	14.2	16.8	14.0	15.1	11.3	9.2	8.4	9.2	17.1	19.4	23.1	27.2	28.4	39.0	32.0	29.4	28.9	31.3	27.5	18.6
2	24.0	17.8	16.5	19.0	18.4	10.5	13.0	14.5	20.3	17.8	22.2	20.7	23.1	26.2	21.5	23.7	17.1	16.3	19.9	17.3	17.1	13.7	12.4	12.2	14.0	23.3	24.4	27.1	31.4	35.1	45.3	38.1	35.1	34.8	37.7	32.4	22.6

Table I-58 Water Balance of Kemasin River in Future Condition (2010)

Scheme : Kemasin / Semerak River : Kemasin River
 Sub-Scheme : Jelawat Rusa, Kemasin Hilir Condition : Future Water Demand

<1> WR Case 1 (Overall Irrigation Efficiency = 45%, Present Cropping Pattern)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	4.3	4.1	4.5	4.8	4.6	3.2	1.8	0.2	0.0	0.0	1.8	4.2	4.5	3.4	2.0	3.1	3.2	3.4	2.8	2.7	2.6	3.1	2.6	2.3	1.4	0.8	0.1	1.9	4.3	4.0	3.1	1.8	2.1	2.0	2.4	2.9	2.7
10	3.5	3.5	3.8	4.1	3.9	2.7	1.4	0.2	0.0	0.0	1.8	4.0	4.3	3.2	1.9	2.8	2.7	2.8	2.4	2.2	2.2	2.6	2.0	1.0	0.6	0.0	1.9	4.1	3.8	2.7	1.5	1.7	1.5	1.8	2.3	2.3	
5	2.8	2.8	3.0	3.4	3.2	2.1	1.2	0.1	0.0	0.0	1.8	3.9	4.0	2.9	1.8	2.5	2.4	2.1	1.8	1.7	1.7	2.0	1.5	0.7	0.5	0.0	1.8	3.9	3.4	2.4	1.2	1.3	1.1	1.3	1.6	1.9	
4	2.0	2.5	2.8	3.2	3.0	1.9	1.1	0.1	0.0	0.0	1.8	3.9	3.9	2.8	1.8	2.4	2.1	2.0	1.7	1.6	1.6	1.7	1.3	0.6	0.3	0.0	1.8	3.8	3.3	2.3	1.0	1.1	0.8	1.0	1.4	1.8	
3	2.3	2.3	2.4	2.9	2.7	1.6	1.0	0.1	0.0	0.0	1.8	3.8	3.8	2.7	1.7	2.2	2.0	1.6	1.4	1.4	1.3	1.5	1.1	0.5	0.2	0.0	1.8	3.7	3.2	1.9	0.7	0.7	0.6	0.7	1.1	1.6	
2	1.7	1.8	2.0	2.4	2.1	1.2	0.7	0.1	0.0	0.0	1.7	3.7	3.6	2.6	1.5	1.9	1.6	1.2	1.1	1.1	1.0	1.0	0.7	0.8	0.2	0.1	0.0	1.7	3.4	2.8	1.5	0.2	0.2	0.1	0.3	0.7	1.3

<2> WR Case 2 (Overall Irrigation Efficiency = 60%, Present Cropping Pattern)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	3.2	3.1	3.4	3.6	3.5	2.4	1.4	0.2	0.0	0.0	1.4	3.2	3.4	2.6	1.5	2.3	2.4	2.6	2.1	2.0	2.0	2.3	2.0	1.7	1.1	0.6	0.1	1.4	3.2	3.0	2.3	1.4	1.6	1.5	1.8	2.2	2.0
10	2.6	2.6	2.9	3.1	2.9	2.0	1.1	0.2	0.0	0.0	1.4	3.0	3.2	2.4	1.4	2.1	2.0	2.1	1.8	1.7	1.7	2.0	1.5	0.8	0.2	0.0	1.4	3.1	2.9	2.0	1.1	1.3	1.1	1.4	1.7	1.7	
5	2.1	2.1	2.3	2.6	2.4	1.6	0.9	0.1	0.0	0.0	1.4	2.9	3.0	2.2	1.4	1.9	1.8	1.6	1.4	1.4	1.3	1.5	1.3	0.8	0.4	0.0	1.4	2.9	2.6	1.8	0.9	1.0	0.8	1.0	1.2	1.4	
4	2.0	1.9	2.1	2.4	2.3	1.4	0.8	0.1	0.0	0.0	1.4	2.9	2.9	2.1	1.4	1.8	1.6	1.5	1.3	1.2	1.2	1.3	1.0	0.5	0.2	0.0	1.4	2.9	2.5	1.6	0.8	0.8	0.6	0.8	1.1	1.3	
3	1.7	1.7	1.8	2.2	2.0	1.2	0.8	0.1	0.0	0.0	1.4	2.9	2.9	2.0	1.3	1.7	1.5	1.2	1.1	1.1	1.0	1.1	0.8	0.9	0.4	0.2	0.0	1.4	2.8	2.4	1.4	0.5	0.5	0.5	0.5	0.8	1.2
2	1.3	1.4	1.5	1.8	1.6	0.9	0.5	0.1	0.0	0.0	1.3	2.8	2.7	2.0	1.1	1.4	1.2	0.9	0.8	0.8	0.8	0.8	0.5	0.6	0.2	0.1	0.0	1.3	2.6	2.1	1.1	0.2	0.2	0.1	0.2	0.5	1.0

<3> qia (Available Water at Intake Point of the Study Area)

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual	
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3					
20	7.8	7.0	7.3	6.7	6.6	6.0	6.4	5.7	6.0	5.8	5.5	5.3	5.3	5.6	6.1	6.6	6.9	6.4	6.8	7.1	6.7	6.1	7.2	7.9	6.5	7.4	6.9	6.9	7.2	6.9	7.2	8.1	7.2	13.8	8.2	7.3	6.9	
10	8.1	7.3	7.6	7.0	6.9	6.2	6.8	6.0	6.3	6.1	5.7	5.5	5.5	5.8	6.3	6.8	7.2	7.2	7.2	7.2	7.2	6.8	6.3	7.5	8.3	6.9	7.9	7.3	7.2	7.7	7.2	7.8	8.8	8.3	16.4	9.6	8.3	7.3
5	8.5	7.8	8.1	7.4	7.4	6.6	7.3	6.5	6.8	6.5	6.0	5.8	5.7	6.1	6.6	7.2	7.7	7.9	7.5	7.5	7.2	6.6	7.9	8.9	7.5	8.7	8.0	7.8	8.4	8.0	10.3	21.3	12.2	9.9	8.1	8.6		
4	8.8	8.0	8.4	7.6	7.6	6.7	7.6	6.9	7.0	6.7	6.2	5.9	5.9	6.2	6.8	7.4	7.9	7.5	8.3	7.8	7.4	6.9	8.1	9.3	7.8	9.1	8.4	8.2	8.8	8.2	9.4	10.7	11.6	24.5	13.9	11.0	8.6	
3	9.1	8.4	8.8	8.0	8.0	7.0	8.1	7.5	7.4	7.0	6.5	6.2	6.1	6.5	7.2	7.7	8.3	7.9	8.8	8.2	7.7	7.2	8.5	9.7	8.4	9.8	8.9	8.7	9.4	8.7	10.2	11.7	13.8	29.7	16.6	12.6	9.3	
2	9.5	9.0	9.4	8.5	8.5	7.5	8.9	8.5	8.1	7.6	6.9	6.7	6.7	6.9	7.7	8.2	8.8	8.5	9.8	8.7	8.3	7.8	9.0	10.4	9.3	10.8	9.8	9.7	10.3	9.6	11.7	13.4	18.1	30.4	21.7	15.8	10.5	

Table I-58 Water Balance of Kemasin River in Future Condition (2010)

Scheme : Kemasin / Semerak River : Kemasin River
 Sub-Scheme : Jelawat Rusa, Kemasin Hilir Condition : Future Water Demand

<4> Water Balance of Case 1 (Overall Irrigation Efficiency = 45%, Present Cropping Pattern)
 Water Balance >0: Excess Water Balance <0: Deficit

Month/10days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3						
20	5.5	2.9	2.8	1.9	2.0	2.8	4.6	5.5	6.0	5.8	3.7	1.1	0.8	2.2	4.1	3.5	3.7	3.0	4.0	4.4	4.1	3.0	4.6	5.6	5.1	6.6	6.8	5.0	2.9	4.1	6.3	5.1	11.8	5.8	4.4	4.2						
10	4.6	3.8	3.8	2.9	3.0	3.5	5.4	5.8	6.3	6.1	3.9	1.5	1.2	2.6	4.4	4.0	4.5	3.9	4.8	5.0	4.6	3.7	5.5	6.3	5.9	7.3	7.1	5.3	3.6	3.4	5.1	7.3	6.6	14.9	7.8	6.0	5.0					
5	3.9	3.0	3.0	2.1	2.1	2.4	4.5	4.8	5.2	5.1	3.2	1.2	0.8	1.7	3.2	4.8	4.7	5.3	5.1	6.1	5.7	5.5	4.6	6.4	7.4	6.8	6.2	4.0	4.5	4.4	6.4	8.8	9.0	20.2	10.9	8.5	6.2					
4	3.2	2.5	2.5	1.6	1.6	1.8	3.8	4.1	4.4	4.4	2.0	0.8	0.5	1.0	2.0	3.4	5.0	5.8	5.5	6.6	6.2	5.8	5.2	6.8	8.0	7.2	6.8	6.4	5.0	4.9	7.3	9.7	10.5	23.7	12.9	9.6	6.8					
3	2.8	2.1	2.1	1.2	1.2	1.4	3.1	3.4	3.7	3.7	1.5	0.5	0.3	0.7	1.4	2.4	3.8	4.5	4.3	5.5	5.5	6.3	6.1	7.4	6.8	6.4	5.7	7.4	8.5	7.9	9.6	8.9	6.9	5.7	5.5	4.3	11.0	13.1	29.1	15.9	11.5	7.7
2	2.4	1.8	1.8	0.9	0.9	1.1	2.6	2.9	3.2	3.2	1.1	0.3	0.2	0.4	0.9	1.3	2.3	2.8	2.7	3.8	3.8	4.5	4.3	5.2	5.6	5.1	4.5	5.2	6.1	5.6	6.8	6.3	4.8	10.2	13.2	17.9	39.3	21.4	15.1	9.3		

<5> Water Balance of Case 2 (Overall Irrigation Efficiency = 60%, Present Cropping Pattern)
 Water Balance >0: Excess Water Balance <0: Deficit

Month/10days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3						
20	4.6	3.9	3.9	3.1	3.2	3.6	5.1	5.5	6.0	5.8	4.2	2.2	1.9	3.1	4.6	4.2	4.5	3.9	4.7	5.1	4.7	3.8	5.3	6.2	5.4	6.8	6.8	5.5	4.0	3.9	4.9	6.7	5.6	12.3	6.4	5.1	4.9					
10	5.5	4.7	4.8	3.9	4.0	4.2	5.7	5.8	6.3	6.1	4.4	2.5	2.2	3.4	4.3	4.7	5.2	4.6	5.4	5.6	5.2	4.4	6.0	6.8	6.1	7.5	7.3	5.8	4.6	4.4	5.8	7.7	7.0	15.3	8.3	6.5	5.6					
5	4.6	3.7	3.7	2.4	2.4	2.7	3.9	4.2	4.5	4.7	2.8	1.0	0.7	1.4	2.7	3.9	5.2	5.9	5.6	6.5	6.2	5.9	5.1	6.8	7.0	6.3	5.9	6.5	5.5	5.2	7.0	9.1	9.3	20.5	11.3	8.7	6.7					
4	3.8	3.0	3.0	1.8	1.8	2.0	3.1	3.4	3.7	3.7	1.5	0.5	0.3	0.7	1.4	2.4	3.8	4.5	4.3	5.5	5.5	6.3	6.1	7.4	6.8	6.4	5.7	7.4	8.5	7.9	9.6	8.9	6.9	5.7	5.5	4.3	11.0	13.1	29.1	15.9	11.5	7.7
3	3.2	2.5	2.5	1.2	1.2	1.4	2.6	2.9	3.2	3.2	1.1	0.3	0.2	0.4	0.9	1.3	2.3	2.8	2.7	3.8	3.8	4.5	4.3	5.2	5.6	5.1	4.5	5.2	6.1	5.6	6.8	6.3	4.8	10.2	13.2	17.9	39.3	21.4	15.1	9.3		
2	2.8	2.1	2.1	0.9	0.9	1.1	2.6	2.9	3.2	3.2	1.1	0.3	0.2	0.4	0.9	1.3	2.3	2.8	2.7	3.8	3.8	4.5	4.3	5.2	5.6	5.1	4.5	5.2	6.1	5.6	6.8	6.3	4.8	10.2	13.2	17.9	39.3	21.4	15.1	9.3		

Table I-60 Water Balance of Angga River in Future Condition (2010)

Scheme : Besut River : Angga River
 Sub-Scheme : Angga Barrage Condition : Future Water Demand

<5> Water Balance of Case 1 (Overall Irrigation Efficiency = 45%, Present Cropping Pattern)
 Water Balance >0: Excess Water Balance <0: Deficit

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	6.9	3.5	0.2	-2.1	-2.4	-2.8	-2.9	-3.1	-2.1	-0.2	1.3	1.3	-0.5	3.4	0.3	0.4	-1.2	-0.5	-1.1	-1.0	-0.4	-0.9	-0.3	-0.5	0.0	3.0	3.9	2.4	2.5	2.6	0.5	2.8	10.0	7.3	8.3	1.0	
10	8.2	5.1	2.0	-0.8	-1.4	-1.9	-1.8	-2.1	-1.2	0.4	1.6	1.7	-0.2	2.8	0.8	0.9	-0.6	0.1	-0.3	0.1	0.4	0.1	0.5	0.5	1.0	3.8	4.6	3.3	3.2	3.5	2.0	5.4	11.8	9.2	10.2	2.0	
5	10.3	7.0	4.6	3.1	0.0	-0.7	-0.0	-0.3	-0.7	0.0	1.3	2.2	-2.3	-0.3	-1.9	1.5	1.8	0.2	0.6	1.9	1.1	1.6	1.2	1.7	1.9	2.6	3.2	5.8	4.4	5.1	5.1	4.6	9.9	15.7	13.1	3.6	
4	11.8	7.9	6.0	2.1	0.0	-0.2	0.4	0.1	0.5	1.7	2.5	2.6	0.5	-1.4	1.8	2.3	0.7	1.2	1.6	1.8	2.2	1.9	2.3	2.6	3.4	6.3	6.7	5.6	5.0	6.0	6.2	6.3	12.5	18.8	16.1	16.5	
3	13.7	9.3	8.2	3.6	1.7	0.6	1.7	1.1	1.4	2.4	2.9	3.0	0.9	-0.8	2.4	3.0	1.4	1.7	2.5	2.9	3.0	2.9	3.2	3.7	4.7	7.8	7.8	6.9	6.0	7.5	7.9	8.9	16.5	23.5	20.6	20.5	
2	16.9	11.3	12.1	6.4	3.6	2.0	3.9	3.1	2.7	3.4	3.4	3.8	1.5	0.3	3.2	4.0	2.5	2.5	4.2	4.6	4.5	4.4	4.8	5.8	7.1	10.2	9.8	4.1	7.7	10.0	11.0	13.7	23.6	32.0	29.0	27.5	

<6> Water Balance of Case 2 (Overall Irrigation Efficiency = 60%, Present Cropping Pattern)
 Water Balance >0: Excess Water Balance <0: Deficit

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual	
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3					
20	7.5	4.3	1.0	-1.5	-1.6	-1.9	-2.0	-2.2	-1.3	0.2	1.4	1.3	0.0	-2.3	0.7	0.8	-0.6	0.1	-0.6	-0.5	0.1	-0.4	0.1	0.0	0.3	3.3	4.0	3.3	4.0	2.5	2.5	2.6	1.1	3.9	10.5	7.4	8.7	1.5
10	8.7	5.7	2.9	0.0	-0.6	-1.2	-1.0	-1.3	-0.5	0.7	1.7	1.7	0.3	-1.8	1.2	1.3	0.0	0.6	0.2	0.3	0.8	0.5	0.9	0.9	1.3	4.1	4.7	3.3	3.2	3.5	3.5	2.6	6.5	12.3	9.3	10.5		
5	10.7	7.5	5.3	3.7	0.6	-0.1	-0.3	0.0	0.6	1.5	2.3	2.3	0.8	-0.9	1.9	2.1	0.8	1.0	1.3	1.3	1.5	1.9	1.6	2.0	2.7	5.5	5.9	4.8	4.4	5.1	5.1	5.2	10.9	16.3	15.2	15.9		
4	12.0	8.4	6.6	2.7	1.3	0.4	1.0	0.7	1.1	2.0	2.5	2.6	1.1	-0.5	2.2	2.6	1.3	1.6	1.9	2.2	2.5	2.2	2.6	3.0	3.6	6.5	6.8	5.6	5.0	6.0	6.2	6.8	13.4	19.1	16.2	16.0		
3	13.9	9.7	8.7	4.1	2.3	1.1	2.3	1.7	1.9	2.6	2.9	3.0	1.5	0.2	2.7	3.3	1.9	2.1	2.8	3.2	3.3	3.1	3.5	4.0	4.9	7.9	7.9	6.9	6.0	7.5	7.9	9.4	17.3	23.8	20.6	20.6		
2	17.0	11.6	12.5	6.9	4.0	2.4	4.4	3.6	3.1	3.6	3.5	3.8	2.0	1.2	3.5	4.3	3.0	2.8	4.4	4.9	4.8	4.7	5.0	6.0	7.2	10.3	9.8	9.1	7.7	10.0	11.0	14.2	24.4	32.2	29.0	27.6		

<7> Water Balance of Case 3 (Overall Irrigation Efficiency = 60%, Proposed Cropping Pattern)
 Water Balance >0: Excess Water Balance <0: Deficit

Month/Days Return Period	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec			Annual
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
20	7.5	4.2	1.2	0.2	0.9	0.7	0.7	-1.0	-1.3	-0.4	-0.2	-1.1	-0.4	-1.0	0.3	-0.1	-0.4	0.2	-0.6	-0.2	0.4	0.7	1.5	1.5	1.5	2.4	1.2	1.0	1.6	0.9	1.1	1.9	6.1	10.7	6.5	8.1	
10	8.4	5.7	2.8	1.2	1.5	1.1	1.3	-0.4	-0.8	0.1	0.2	-0.6	0.1	-0.3	0.9	0.6	0.3	0.8	0.1	0.6	1.2	1.4	2.0	2.2	2.2	3.0	1.8	2.0	2.4	2.0	2.3	3.5	8.7	12.6	8.5	9.9	
5	10.4	7.5	5.4	2.8	2.4	1.7	2.3	0.5	0.6	0.9	0.7	0.4	0.8	-0.7	1.7	1.7	1.3	1.5	1.3	1.3	1.7	2.3	2.9	3.3	3.5	4.3	3.1	3.5	3.6	3.8	4.1	6.3	13.0	16.5	12.5	13.2	
4	11.8	8.4	6.7	3.8	2.9	2.1	2.9	1.1	0.4	1.2	1.0	0.5	1.1	1.2	2.1	2.3	1.8	1.9	1.9	2.4	2.9	2.9	3.4	3.9	4.3	5.2	4.0	4.4	4.3	4.7	5.3	7.9	15.6	19.6	15.4	16.0	
3	13.7	9.7	8.8	5.2	3.7	2.6	3.9	1.9	1.1	1.9	1.4	0.9	1.5	1.9	2.7	3.1	2.5	2.3	2.7	3.4	3.6	3.8	4.2	4.9	5.4	6.7	5.2	5.7	5.3	6.3	7.1	10.5	19.4	24.3	20.0	20.0	
2	16.9	11.6	12.7	7.7	5.3	3.6	5.8	3.7	2.5	2.8	2.0	1.5	2.3	3.1	3.6	4.3	3.7	3.1	4.3	5.0	5.1	5.1	5.5	6.7	7.6	8.9	7.3	8.0	7.1	9.0	10.4	15.2	26.2	32.7	27.7	27.1	

FIGURES

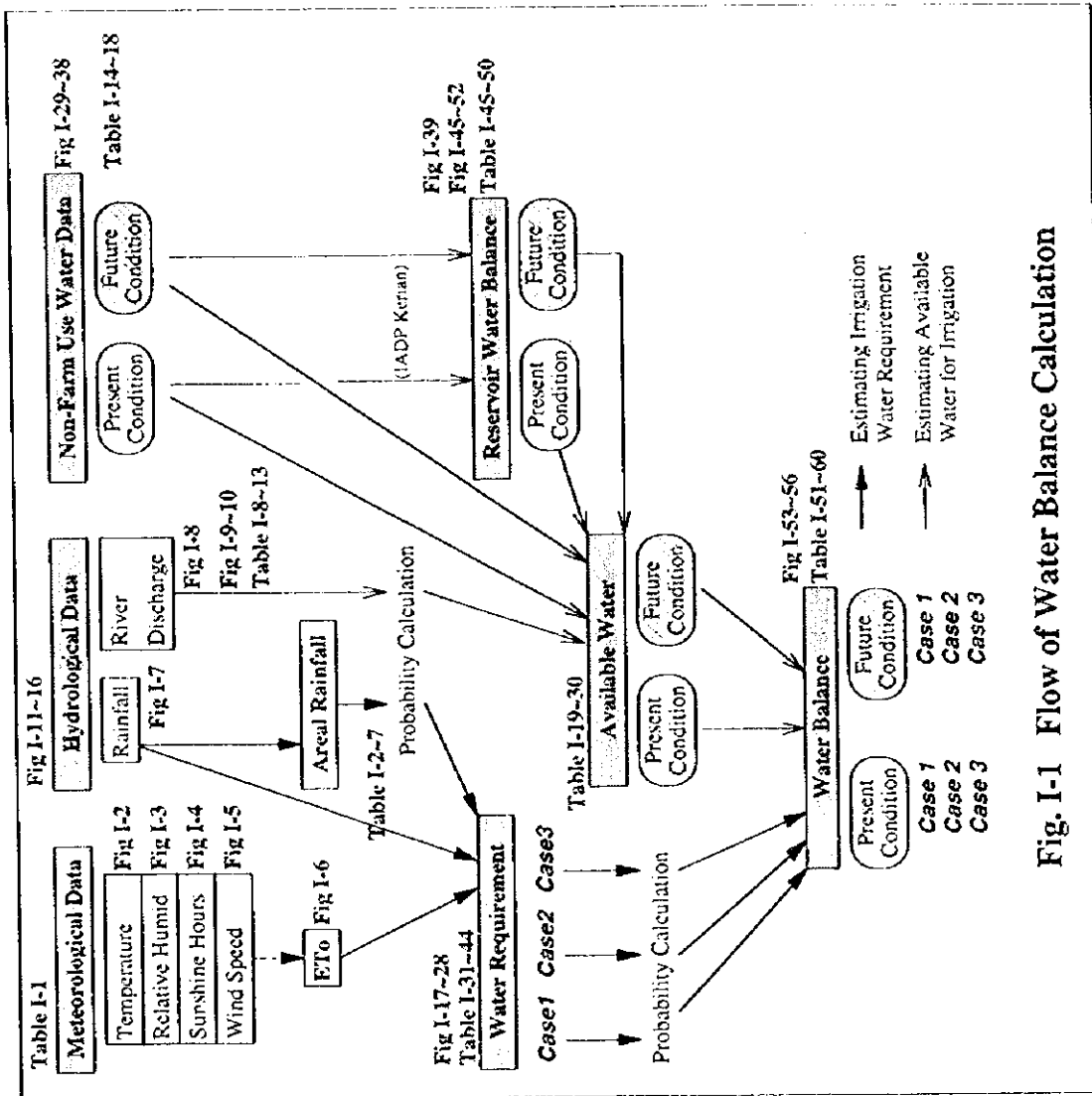
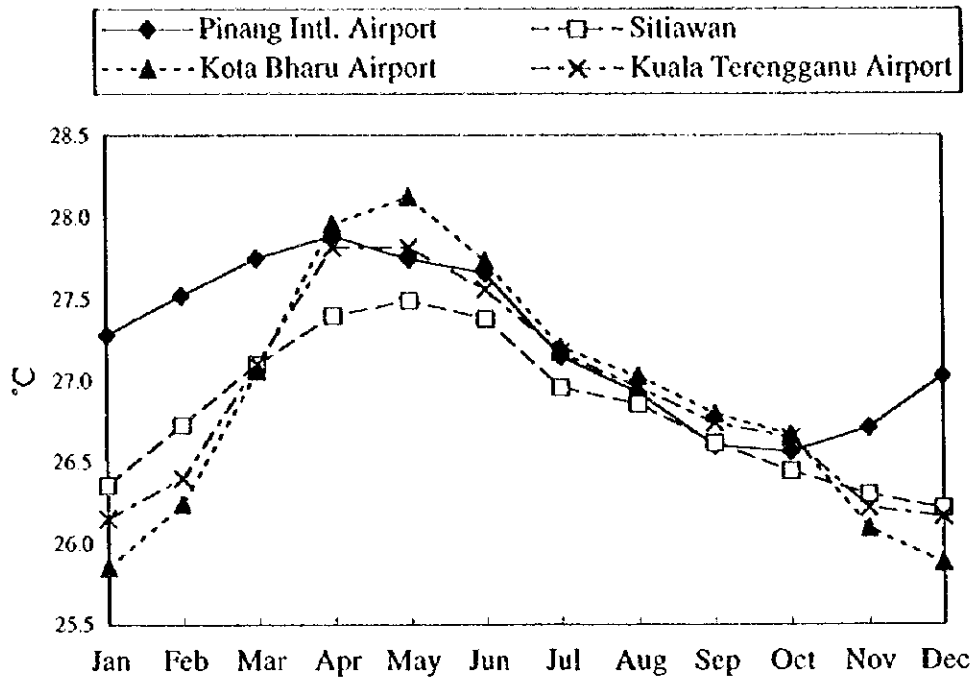
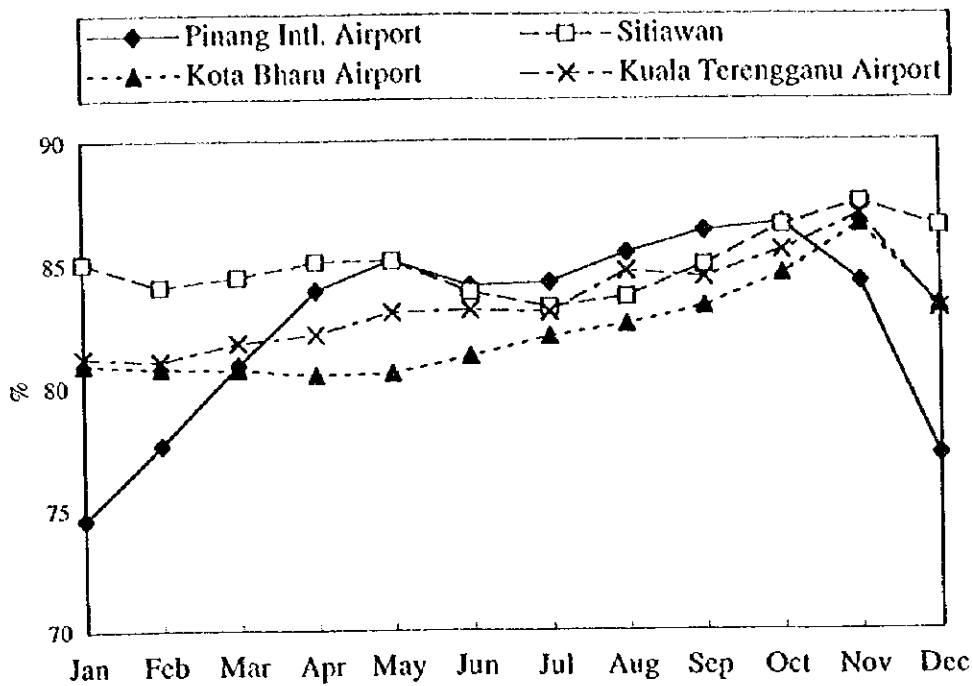


Fig. I-1 Flow of Water Balance Calculation



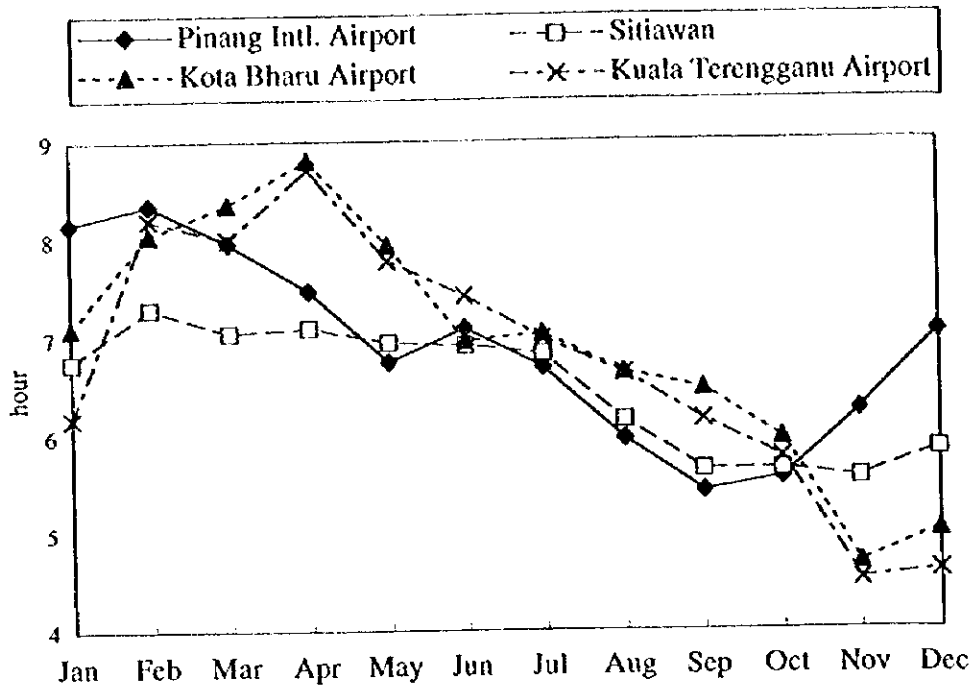
	(°C)			
	Pinang Airport	Sitiawan	Kota Bharu Airport	Kuala Terengganu Airport
Jan	27.3	26.4	25.9	26.2
Feb	27.5	26.7	26.2	26.4
Mar	27.8	27.1	27.1	27.1
Apr	27.9	27.4	28.0	27.8
May	27.7	27.5	28.1	27.8
Jun	27.7	27.4	27.7	27.6
Jul	27.2	27.0	27.2	27.2
Aug	26.9	26.9	27.0	27.0
Sep	26.6	26.6	26.8	26.7
Oct	26.6	26.4	26.7	26.7
Nov	26.7	26.3	26.1	26.2
Dec	27.0	26.2	25.9	26.2
Average	27.2	26.8	26.9	26.9

Fig. I-2 Monthly 24-Hour Mean Temperature at Principal Meteorological Station



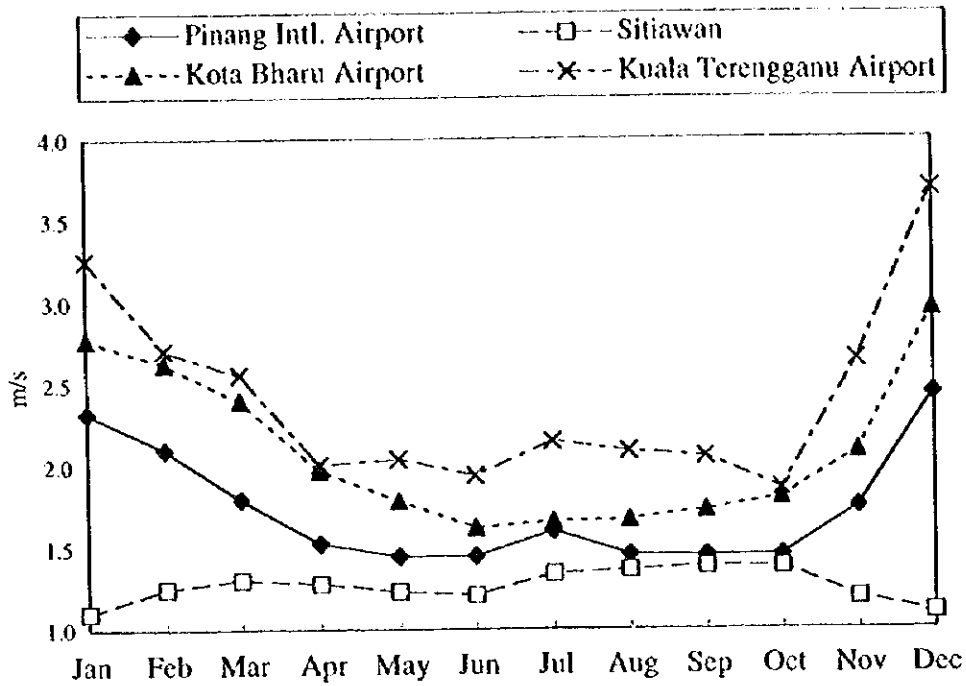
	Pinang Airport	Sitiawan	Kota Bharu Airport	Kuala Terengganu Airport
Jan	74.6	85.1	80.9	81.2
Feb	77.6	84.1	80.7	81.0
Mar	80.9	84.5	80.7	81.8
Apr	83.9	85.1	80.5	82.1
May	85.1	85.1	80.6	83.0
Jun	84.1	83.9	81.2	83.1
Jul	84.2	83.2	82.0	83.0
Aug	85.4	83.7	82.5	84.7
Sep	86.3	85.0	83.3	84.4
Oct	86.6	86.5	84.6	85.5
Nov	84.3	87.5	86.6	87.0
Dec	77.2	86.5	83.3	83.1
Average	82.5	85.0	82.2	83.3

Fig. I-3 Monthly 24-Hour Mean Relative Humidity at Principal Meteorological Station



	(hour)			
	Pinang Airport	Sitiawan	Kota Bharu Airport	Kuala Terengganu Airport
Jan	8.2	6.8	7.1	6.2
Feb	8.4	7.3	8.1	8.2
Mar	8.0	7.1	8.4	8.0
Apr	7.5	7.1	8.8	8.7
May	6.8	7.0	7.9	7.8
Jun	7.1	6.9	7.0	7.4
Jul	6.7	6.8	7.0	7.0
Aug	6.0	6.2	6.6	6.6
Sep	5.4	5.6	6.5	6.2
Oct	5.6	5.6	6.0	5.8
Nov	6.2	5.6	4.7	4.5
Dec	7.1	5.9	5.0	4.6
Average	6.9	6.5	6.9	6.7

Fig. I-4 Monthly Mean Daily Sunshine Hours at Principal Meteorological Station

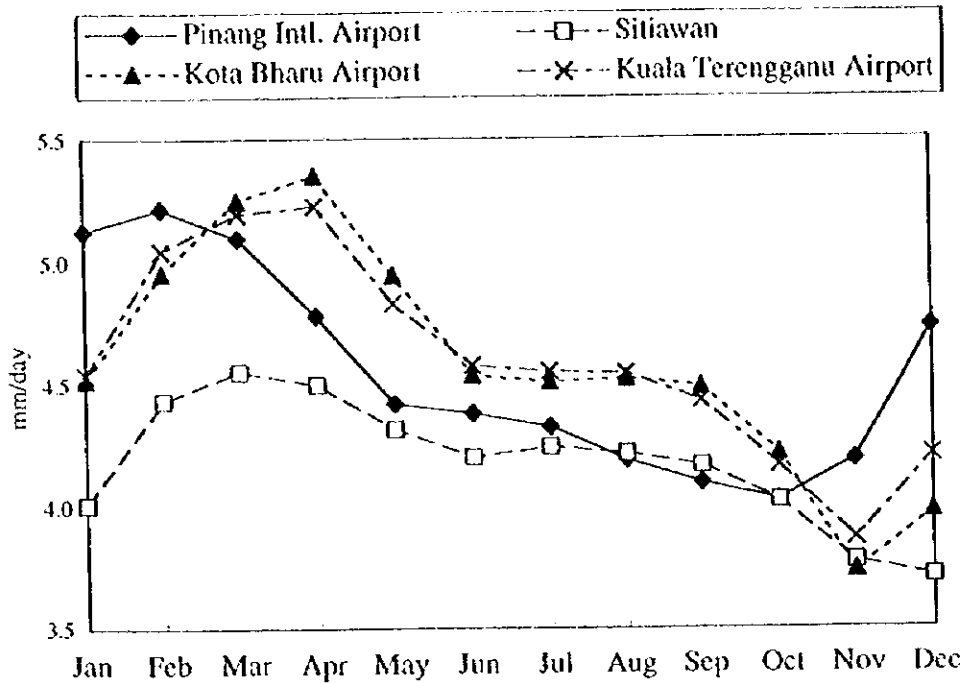


Height of anemometer head above ground (m)

Pinang Airport	Sitiawan	Kota Bharu Airport	Kuala Terengganu Airport
12.5	16.8	14.0	14.0

	(m/s)			
	Pinang Airport	Sitiawan	Kota Bharu Airport	Kuala Terengganu Airport
Jan	2.3	1.1	2.8	3.3
Feb	2.1	1.3	2.6	2.7
Mar	1.8	1.3	2.4	2.6
Apr	1.5	1.3	2.0	2.0
May	1.4	1.2	1.8	2.0
Jun	1.4	1.2	1.6	1.9
Jul	1.6	1.3	1.7	2.2
Aug	1.5	1.4	1.7	2.1
Sep	1.5	1.4	1.7	2.1
Oct	1.5	1.4	1.8	1.9
Nov	1.8	1.2	2.1	2.7
Dec	2.4	1.1	3.0	3.7
Average	1.7	1.3	2.1	2.4

Fig. I-5 Monthly Mean Surface Wind Speed at Principal Meteorological Station



	(mm/day)			
	Pinang Airport	Sitiawan	Kota Bharu Airport	Kuala Terengganu Airport
Jan	5.1	4.0	4.5	4.5
Feb	5.2	4.4	5.0	5.0
Mar	5.1	4.6	5.2	5.2
Apr	4.8	4.5	5.4	5.2
May	4.4	4.3	4.9	4.8
Jun	4.4	4.2	4.5	4.6
Jul	4.3	4.2	4.5	4.6
Aug	4.2	4.2	4.5	4.5
Sep	4.1	4.2	4.5	4.4
Oct	4.0	4.0	4.2	4.2
Nov	4.2	3.8	3.7	3.9
Dec	4.7	3.7	4.0	4.2
Average	4.5	4.2	4.6	4.6
Scheme	Pulau Pinang	Sungai Manik	Kemasin/ Semerak	-
	Kerian	Seberang Perak	Besut	-

Fig. I-6 Potential Evapotranspiration Estimated by Modified Penman Method

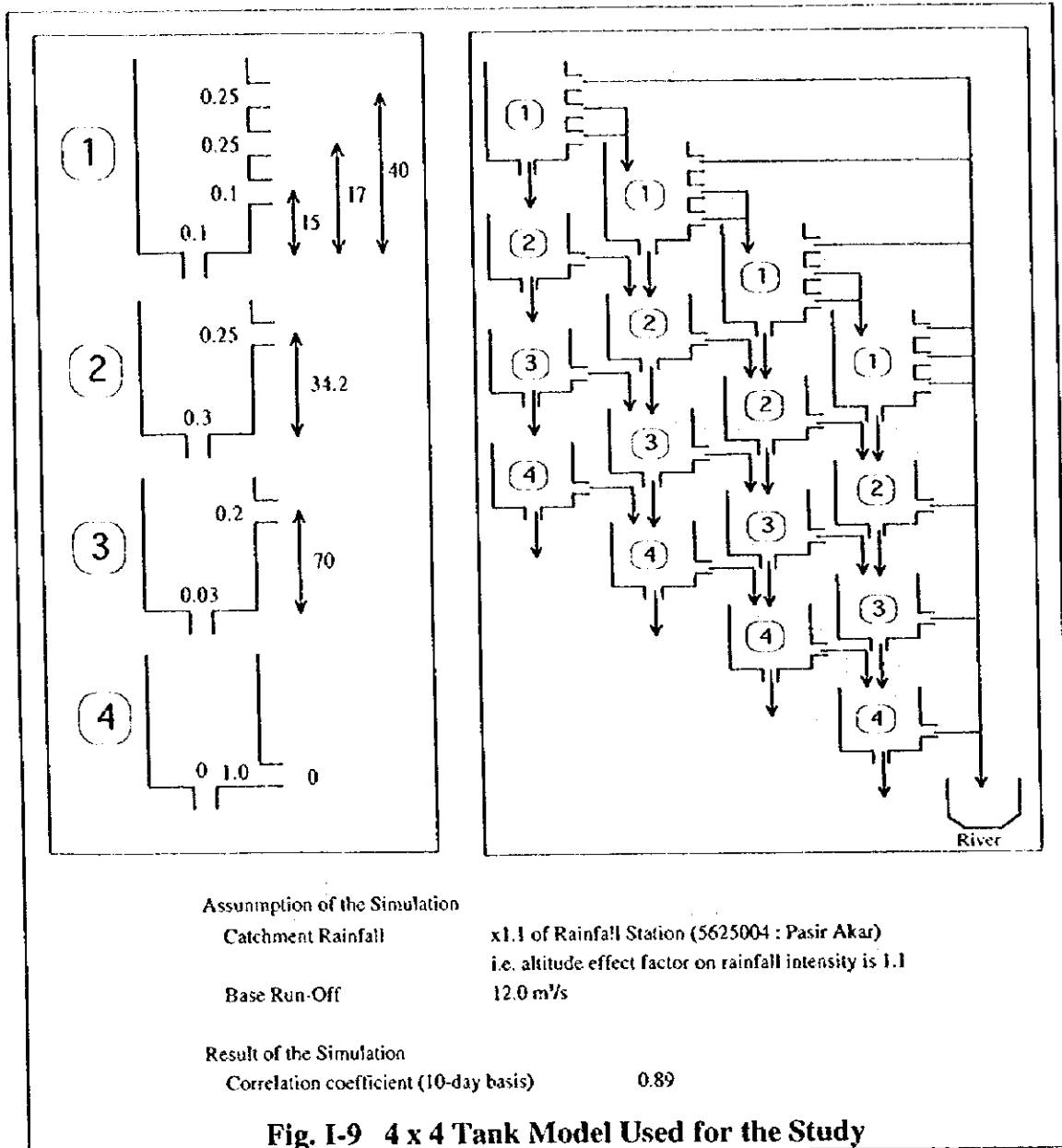
Fig. I-8 Inventory of River Discharge Stations Used for Estimating Available Water for Irrigation

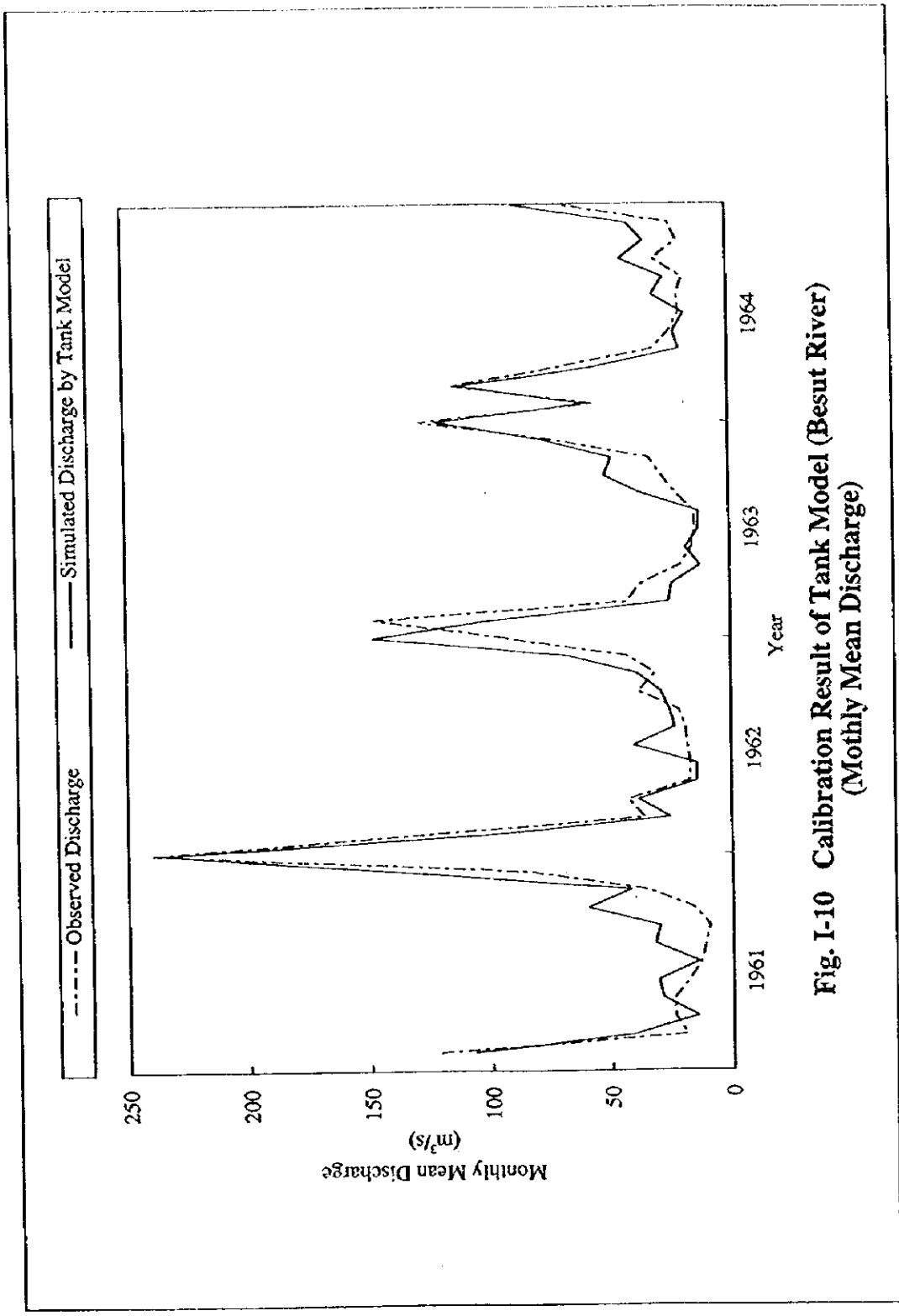
Scheme River	Stanon No. Station Name	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
Kerian Kurau River	5007421 Pondok Tanjung	1981	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1982	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1983	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1984	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1985	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1986	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1987	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1988	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1989	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1990	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3

Scheme River	Stanon No. Station Name	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
Kerian Kurau River	5206432 Selama	1981	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1982	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1983	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1984	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1985	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1986	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1987	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1988	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1989	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
		1990	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3

Fig. I-8 Inventory of River Discharge Stations Used for Estimating Available Water for Irrigation

Scheme River	Station No.	Station Name	Year																		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec							
Sungai Manik Batang Padang River	4111455	Tanjung Keramat	1981	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1982	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1983	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1984	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1985	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1986	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1987	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1988	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1989	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1990	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Kemasin/Semerak Kemasin River	6022421	Peringat	1980	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1981	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1982	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1983	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1984	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1985	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1986	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1987	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1988	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1989	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Ketara (Besut) Besut River		Jerich Bridge (Used for Tank Model)	1961	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1962	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1963	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1964	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
			1965	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3





**Fig. I-10 Calibration Result of Tank Model (Besut River)
(Monthly Mean Discharge)**

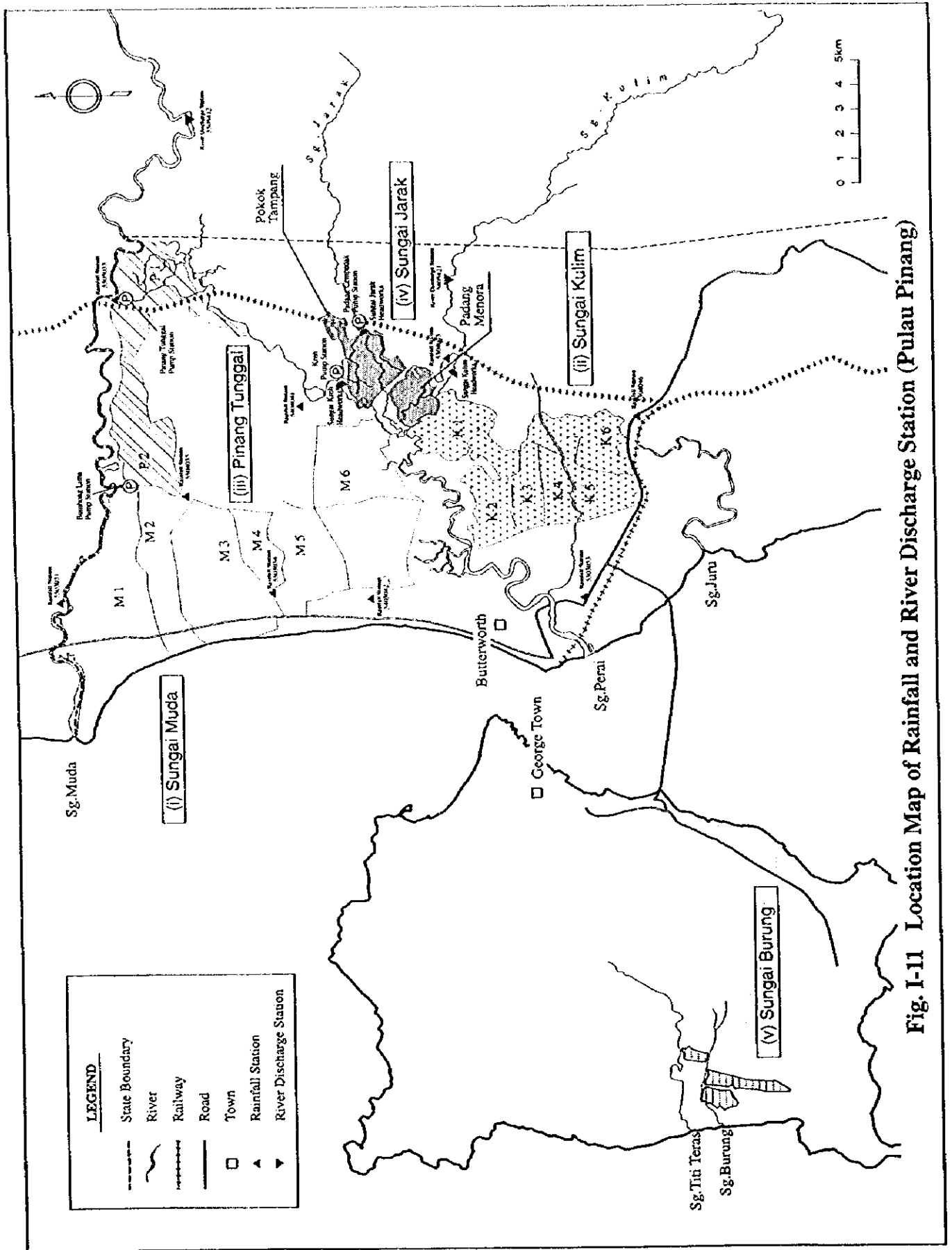


Fig. I-11 Location Map of Rainfall and River Discharge Station (Pulau Pinang)

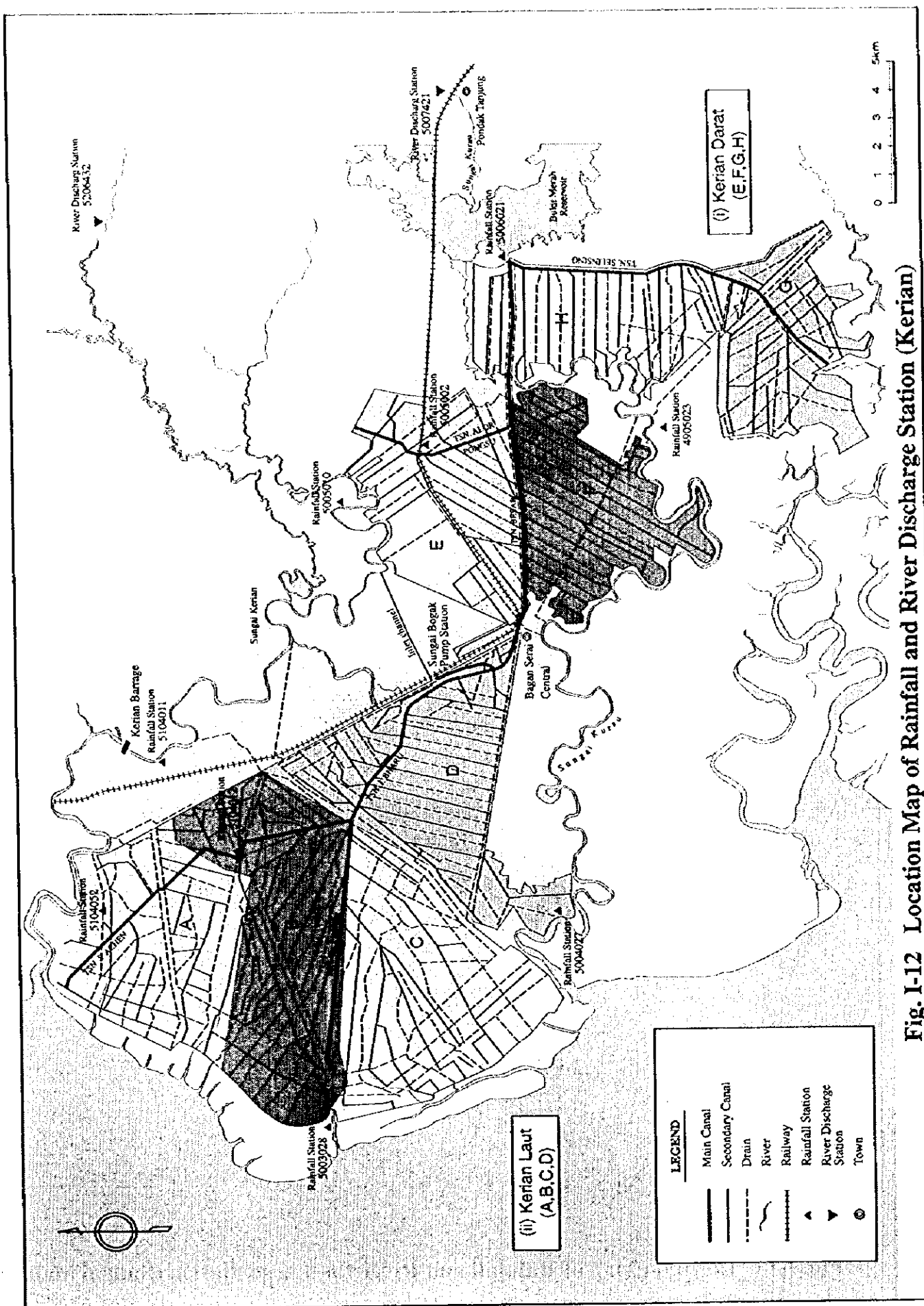


Fig. I-12 Location Map of Rainfall and River Discharge Station (Kerian)

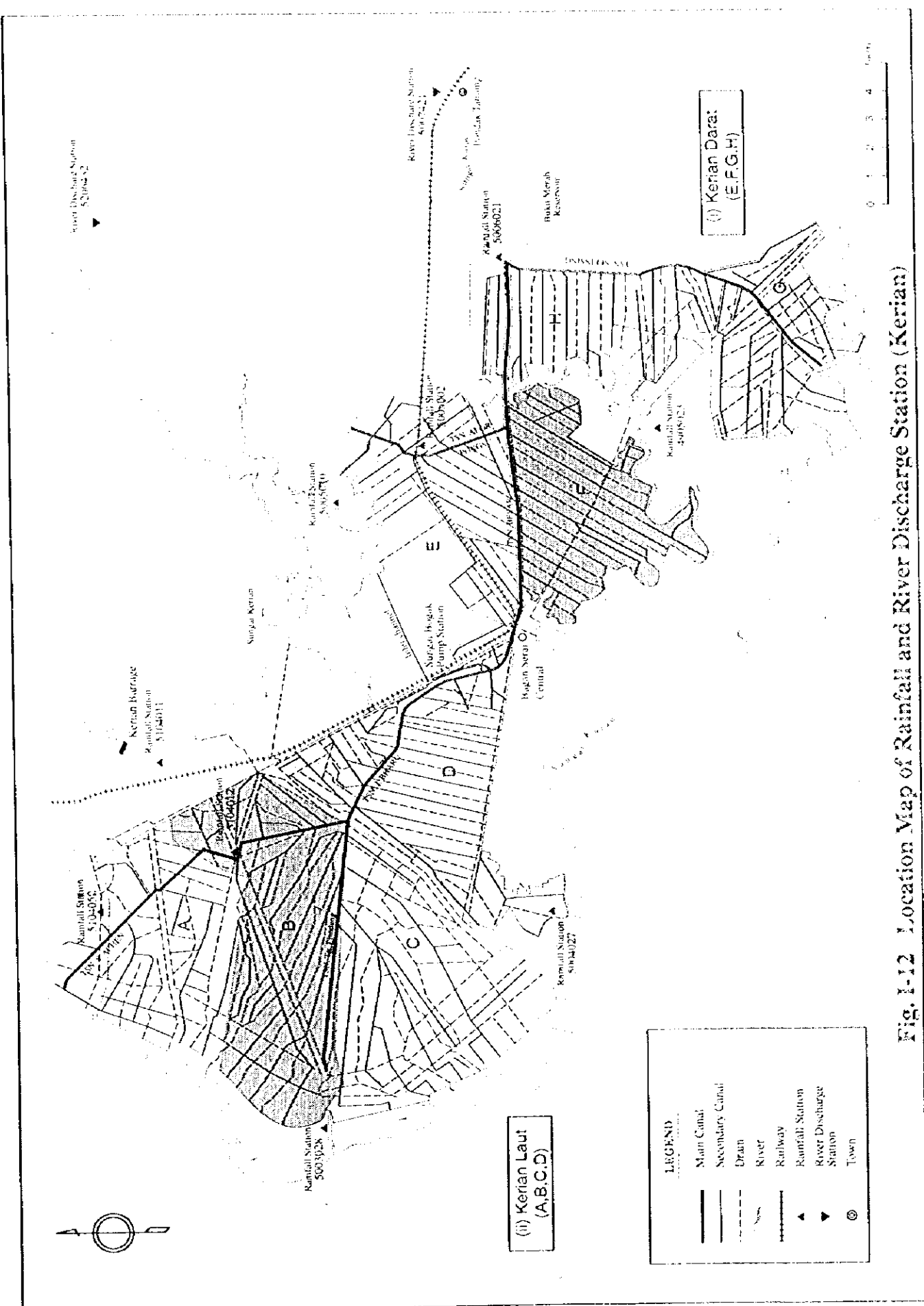


Fig. I-12 Location Map of Rainfall and River Discharge Station (Kerian)

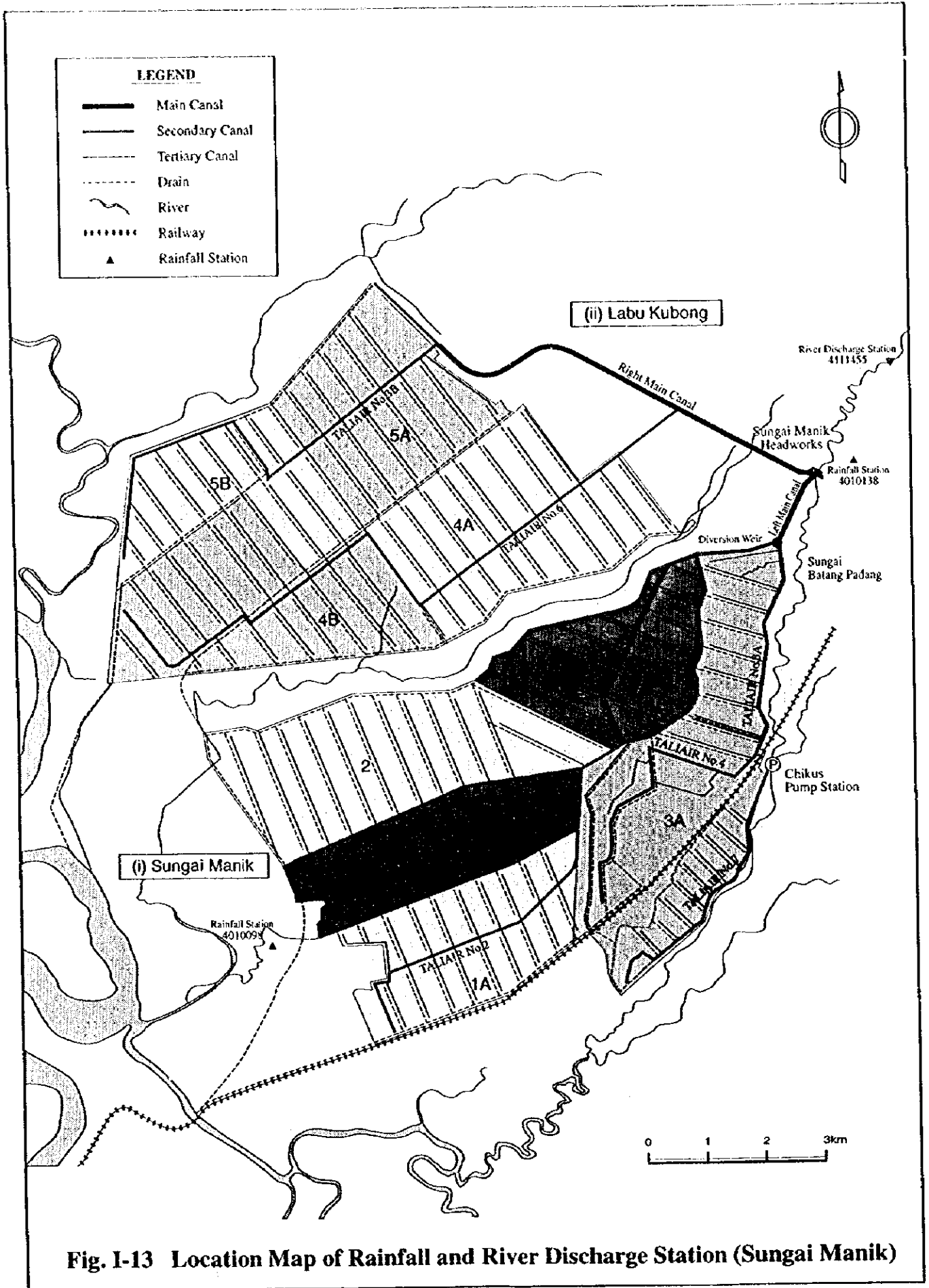
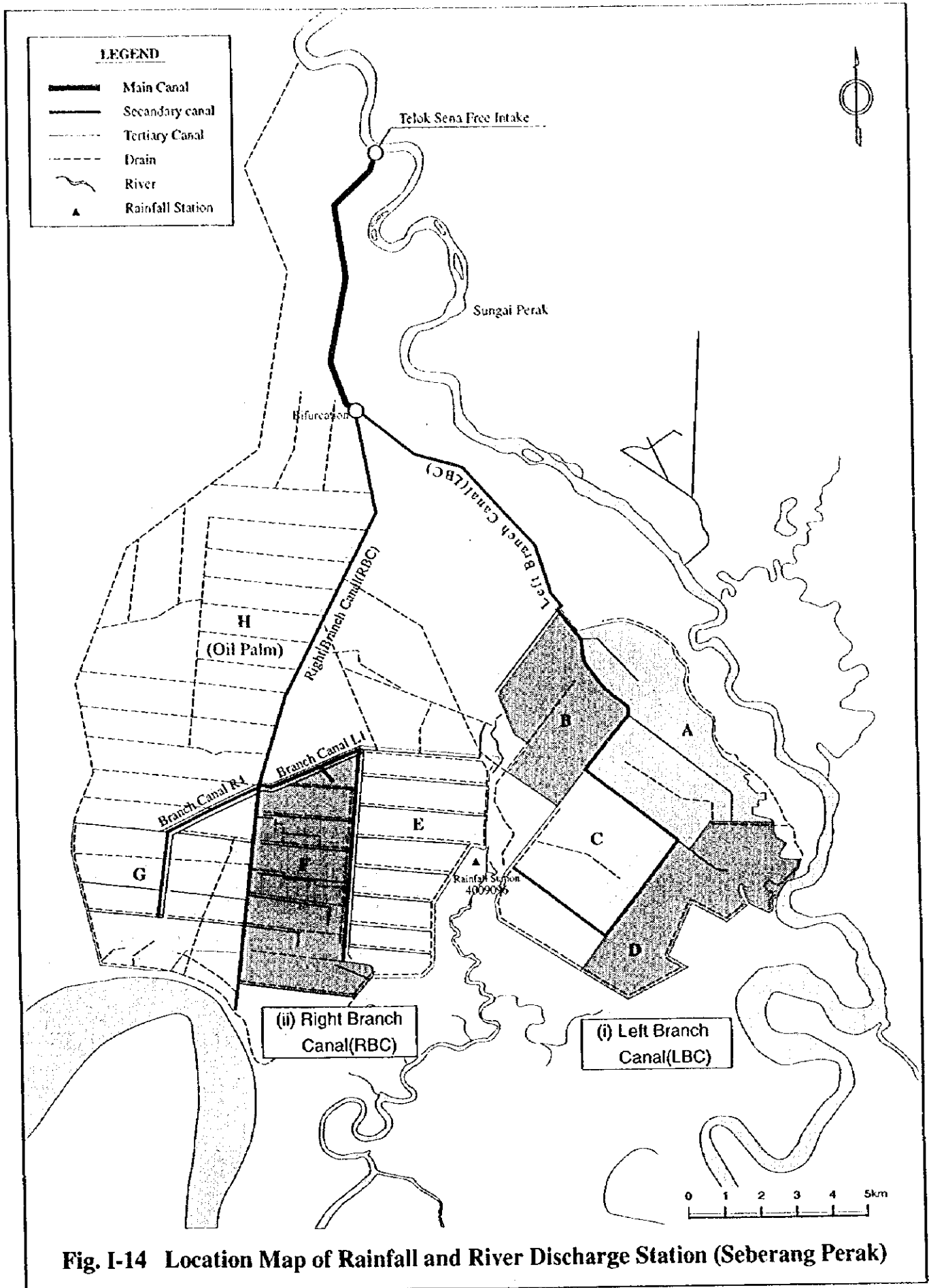


Fig. I-13 Location Map of Rainfall and River Discharge Station (Sungai Manik)



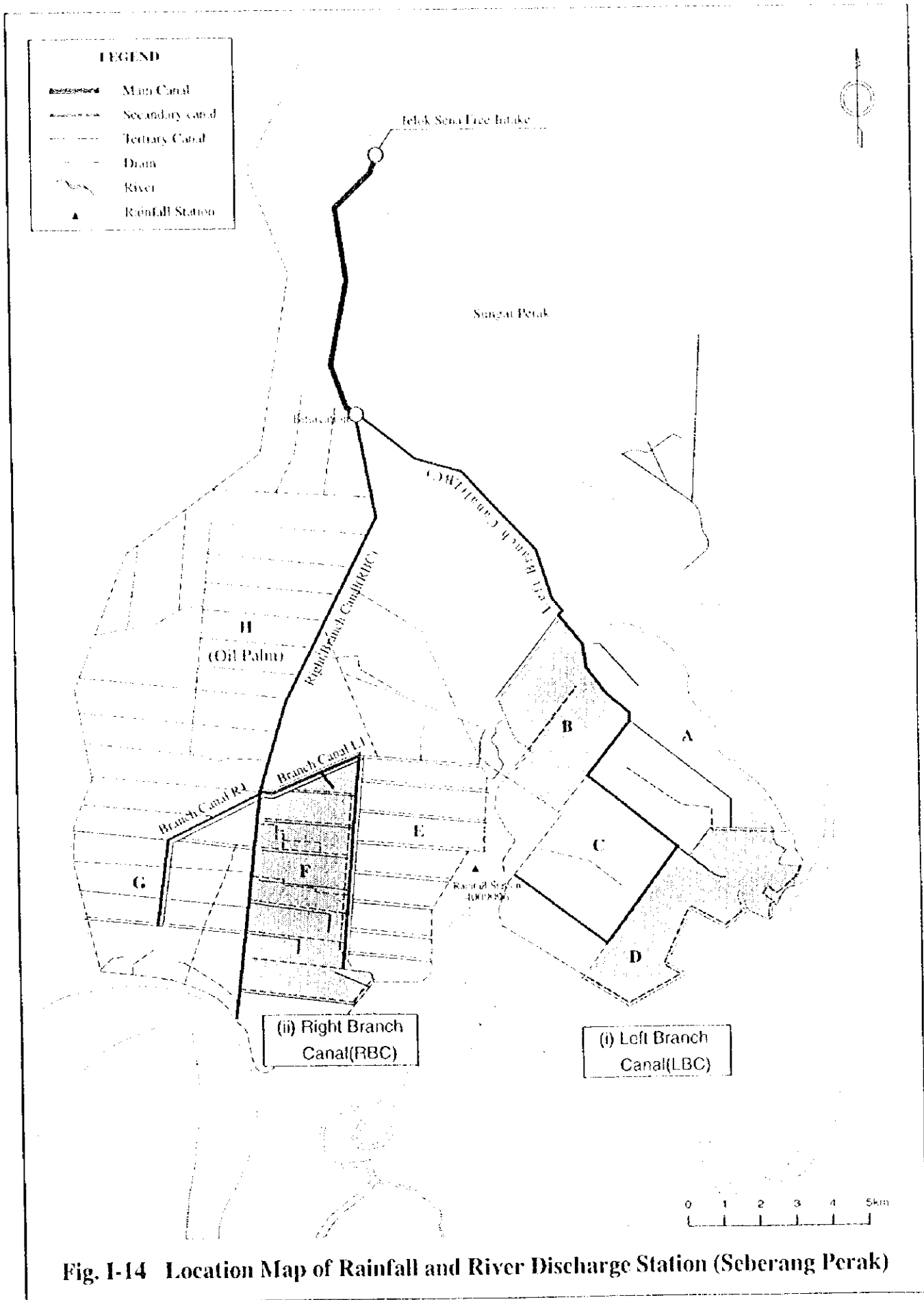


Fig. I-14 Location Map of Rainfall and River Discharge Station (Seberang Perak)

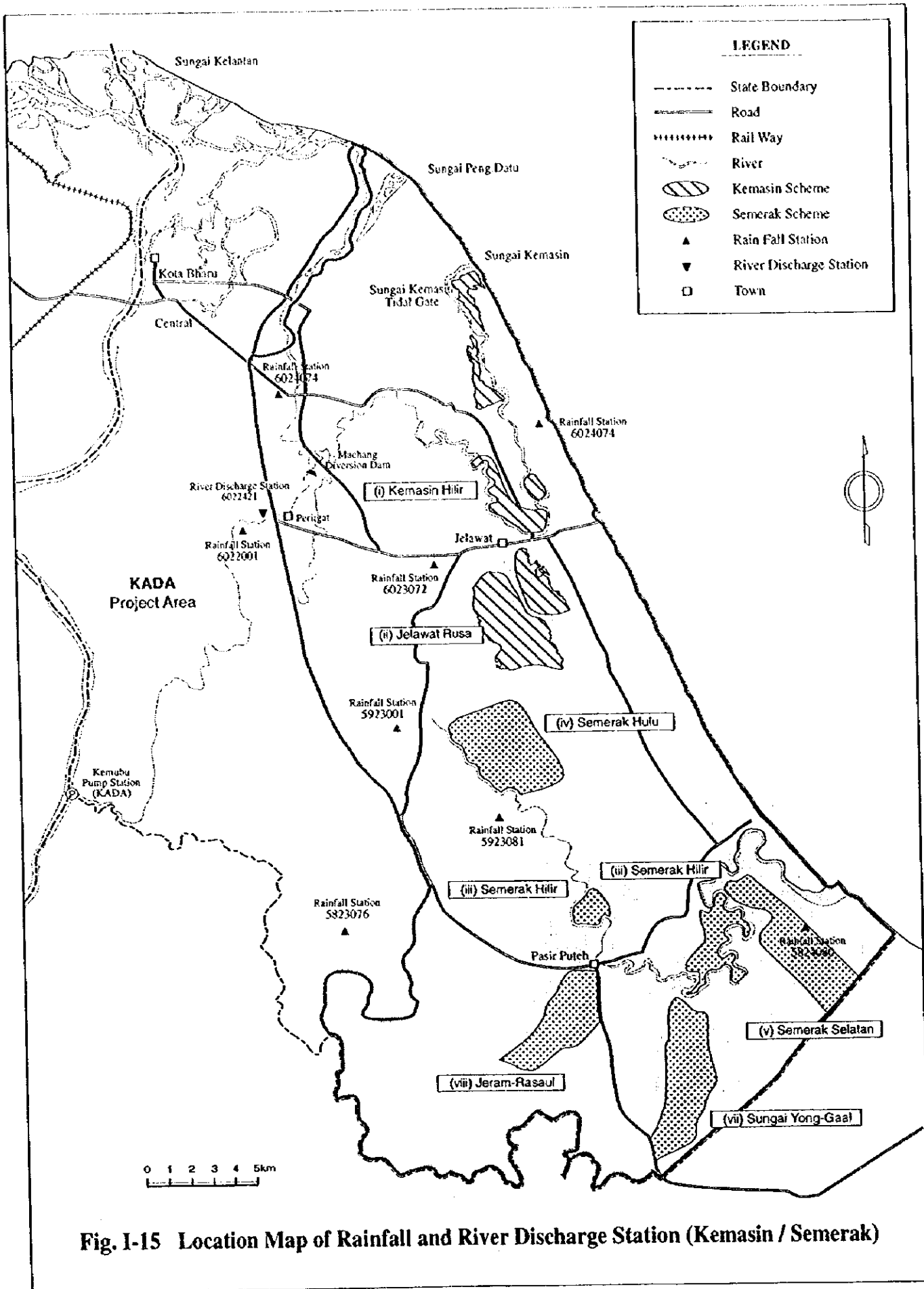


Fig. I-15 Location Map of Rainfall and River Discharge Station (Kemasin / Semerak)

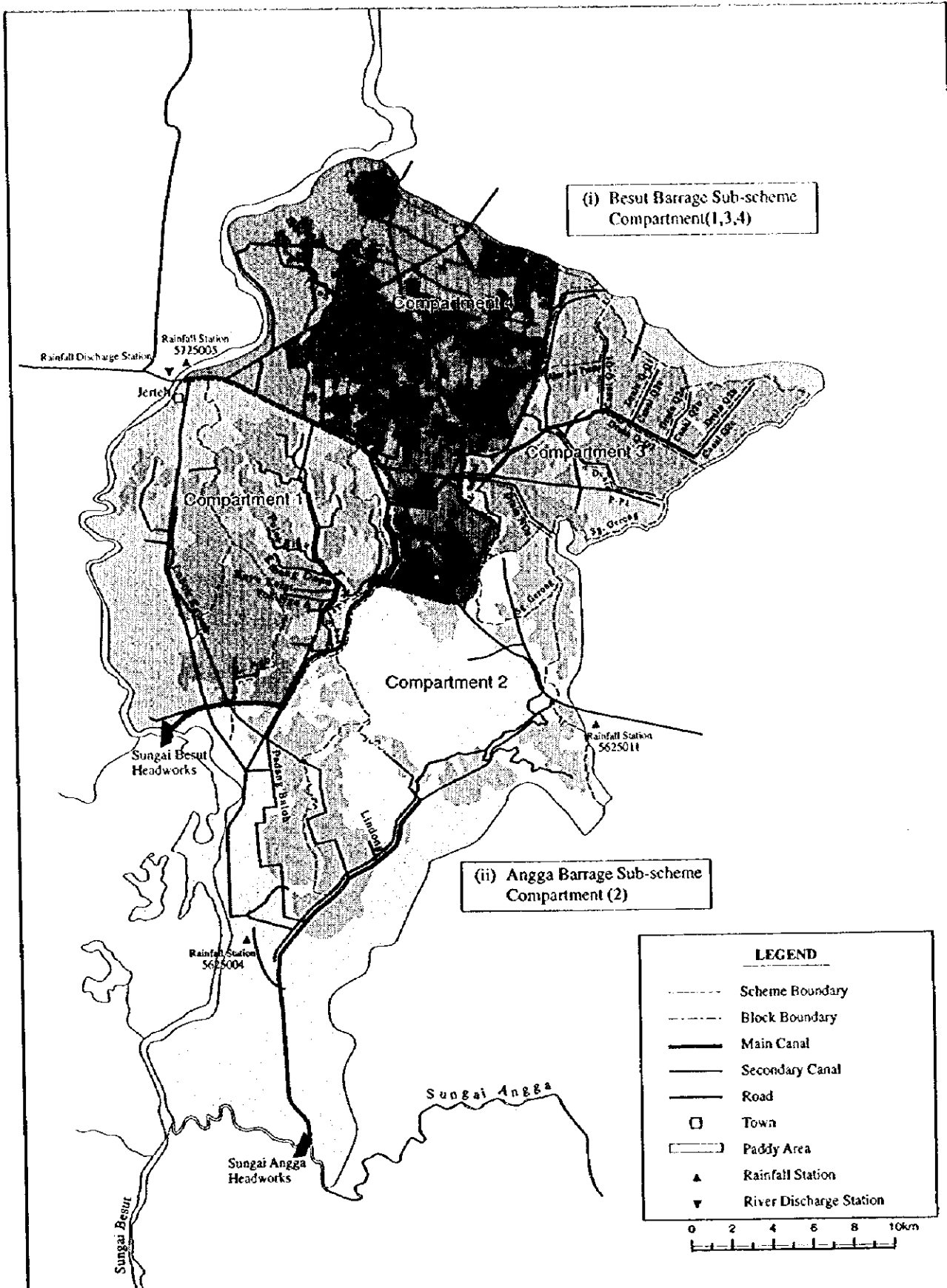


Fig. I-16 Location Map of Rainfall and River Discharge Station [Ketara (Besut)]

