**TABLES** 

VII IRRIGATION DEVELOPMENT PLAN

Table VII.1.1 (1/2) SUMMARY OF AVERAGE CROP PRODUCTIVITY IN STUDY AREA

1. West Sumatra Province						Unit: ton/ha
Commodities			Districts			Average
	Limapuluh Kota	Agam	Tanah Datar	Sijunjung	Solok	
1. Wet Rice	5.12	4.70	7.74	4.42	4.92	5.38
2. Upland Rice	3.03	1.94	2.38	2.38	2.02	2.35
3. Maize	3.63	2.33	2.29	2.24	2.73	2.64
4. Soybeans	1.88	1.14	1.24	1.01	1.75	1.40
5. Groundnuts	2.08	2.30	15.2	1.11	1.81	1.96
6. Green Peas		1.24	76.0	1.22	0.93	1.08
7. Cassava	31.58	18.21	12.11	12.08	20.72	18.94
8. Sweet Potato	26.83	28.28	11.54	5.85	10.35	16.57
9. Cow Peas	08:0			2.00	3.41	2.07
10. Chili Pepper	3.00	4.31	3.43	2.78	3.28	3.36
11. Tomato	7.98	15.73	<b>8.34</b>	-	5.51	9.39
12. Egg Plant	8.28	16.93	-		2.59	9.27
13. Cucumber	2.09	9:00	•	2.30	21.66	8.76

Data Sources: 1. Agricultural Services for Food Crops:
- Limapuluh Kota District (1992)
- Agam District (1993)

- Tanah Datar District (1992)

- Solok District (1993)

2. Statistics Office of West Sumatra Province, West Sumatra in Figures (1992)

Table VII.1.1 (2/2) SUMMARY OF AVERAGE CROP PRODUCTIVITY IN STUDY AREA

2. Riau Province				Unit: ton/ha
Commodities		Districts		Average
	Kampar	Indragiri Hulu	Indragiri Hilir	
1. Wet Rice	3.78	4.01	3.69	3.83
2. Upland Rice	2.04	2.29	2.34	2.22
3. Maize	2.24	2.49	1.19	1.97
4. Soybeans	1.10	1.07	1.37	1.18
5. Groundnuts	1.01	1.04	1.15	1.07
6. Green Peas	1.16	0.95	1.10	1.07
7. Cassava	15.49	14.35	13.39	14.41
8. Sweet Potato	10.24	8.28	7.03	8.52
9. Cow Peas	0.80	2.41	0.55	1.25
10. Chili Pepper	0.87	2.00	0.54	1.14
11. Tomato	1	14.37	•	14.37
12. Egg Plant	1.27	14.80	0.54	5.54
13. Cucumber	1.56	15.02	0.74	5.77

Data sources: 1. Agricultural Services for Food Crops:
- Kampar District (1993)
- Indragiri Hulu District (1993)
- Indragiri Hilir District (1992)
- Statistics Office of Riau Province, Riau in Figures (1993)

Table VII.1.2 REALIZATION AND TARGET OF TRANSMIGRATION SETTLEMENT SCHEMES IN STUDY AREA IN RIAU PROVINCE

1

HIVE BESID	Project	Kind of	Existing Schemes	chemes	Target for Repelita V	Repelita VI	Total	Year of	Remarks
	Name	Transmigration	% .o. of	Allocated	No. of	Allocated	Allocated	Transmioration	
			Households	Area (ha)	Households	Area (ha)	Area (ha)	Commencement	
1. Kampar	1). Sel. Siberuang	Rubber	241	602.50	200	500.00	1,102.50	1992/1993	Local Resettlement
River	2). Sel. Muara Takus /SP1	Rubber	244	610.00	0	00.0	610.00	1993/1994	Local Resettlement
Basin	3). Sel. Muara Takus /SP2	Rubber	599	1,497,50	O	000	1 497 50	1993/1994	Local Recettlement
	4) Koto Ranah	Bibbor	500	7 400 00		700	00.000	10000	Local Heselherina
	E) Danah Ciradal		760	00.00+,1	ນ. ວ່າ	U6.287	7,262.50	1992/1993	Local Resettlement
	o). nailari ou iykai	Hubber	<b>-</b>	00:0	557	1,392.50	1,392.50	1994/1995	Local Resettlement
	6). Hanan Koto Talago	Rubber	0	0.00	313	782.50	782.50	1994/1995	Local Resettlement
	7). Sef. Batu Berusurat	Rubber	0	00'0	700	1,750.00	1,750.00	1994/1995	Local Resettlement
		Oil Palm	447	1,117.50	2,453	6,132.50	7,250.00	1991/1992	Local Resettlement
		Food+Plantation	66	186.00	0	00.0	186.00	1990/1991	
	10). Jasa INDUSTRI	Industry	20	5.00	0	00.0	5.00	_	
	Subtotal for Kampar Kanan		2,266	5,498.50	4,536	11,340,00	16.838.50		
	11). Singingi F PIRTRANS	Oil Palm	2,549	6,372.50	O	00.0	637250	1990/1991	Kah Indragiri Hu
	12). Sei Paku	Food+Plantation	300	00.009	0	000	600.00	1990/1991	
	13). Sei Pagar PIRTRANS	Oil Palm	1,118	2,795.00	259	647.50	3 442 50	1988/1989	I ocal Recettlement
		Forestry	0	0.00	009	1,500.00	1.500.00	1994/1995	
	15). Lipat Kain	Oil Palm	0	00.0	196	2.402.50	2 402 50	1994/1995	Kah Indraniri Hu
	Subtotal for Kampar Kiri		296'6	9,767.50	1,820	4.550.00	14.317.50		200
	16). Langgam/Sorek SBP	Oil Palm	2,148	5,370.00	1.850	4.625.00	9.995.00	1989/1990	
	17). Langgam Ukui SLS	Oil Palm	3,157	7,892.50	0	0.00	7.892.50	1987/1988	
	18). Langgam Ukui IIS	Oil Palm	2,312	5,780.00	0	0.00	5.780.00	1987/1988	
	Subtotal for 16) to 18)		7,617	19,042.50	1,850	4,625.00	23,667,50		
	Total for Kampar River Basin		13,850	34,308,50	8,206	20,515.00	54,823,50		
2. Indragin	1). Ukul IIS/Sei Lala	Oil Palm	2,549	6,372.50	0	0.00	6,372.50	1990/1991	
ğ X		Food+Plantation	200	400.00	400	800.00	1,200.00	1992/1993	
Dasin	3). Peranap	Forestry	0	0.00	300	750.00	750.00	1995/1996	-
	Subtotal for Indragiri Hulu		2,549	6,772.50	700	1,550.00	8,322.50		
	4). Pulau Burung	Oil Palm	1,312	3,280.00	4,263	10,657.50	13,937.50	1991/1992	
	5). Guntung Kateman	Oil Palm	1,000	2,500.00	10,500	26,250.00	28,750.00	1992/1993	
	Subtotal for Indragiri Hijir		2,312	5,780.00	14,763	36,907.50	42,687.50		
	lotal for Indragiri River Basin		4,861	12,553	15,463	38,458	51,010.00		
and Total :	Grand Total for Whole Basin		40 244	10000	2000				

Note Allocated Area : Plantation Oriented Transmigration---- 2.5 ha/household

General Transmigration---2.0 ha/household Transmigration for Industry---0.1 ha/household

Local Resettlement : Resettlement Area for Local People living in Kota Panjang Area to be submerged by Dam Construction

### Table VII.1.3 CLASSIFICATION OF PRESENT IRRIGATION SYSTEM IN STUDY AREA

### 1. West Sumatra Province

### (A) Classification of Irrigation System by Districts

1. Kampar River Basin	District	Irrigation System	No. of Schemes	No. of Schemes not yet reached to Target	Existing Paddy Field (ha)
	Limapuluh	Simple	15	6	63
	Kota	Semi-technical	6	2	871
		Technical	1	Ō	994
		Subtotal	22	8	2,502
<u> </u>	Total		22	8	2,502
. Indragiri River	Limapuluh	Simple	48	8	
Basin	Kota	Semi-technical	20	O	6,122
	per et	Technical	1	O	2,180
		Subtotal	69	8	12,818
	Agam	Simple	2	0	828
		Semi-technical	29	0	3,557
		Technical	0	0	0
		Subtotal	31	O	4,385
	Tanah Datar	Simple	87	0	8,650
		Semi-technical	15	3	4,044
		Technical	0	0	0
		Subtotal	102	3	12,694
	Sijunjung	Simple	40	23	2,660
		Semi-technical	17	7	649
		Technical	1	otalia (ili alia angli alia angli an 🜓	2,35
	<u> </u>	Subtotal	58	31	5,665
	Solok	Simple	59	9	7,222
		Semi-technical	10	5	4,317
		Technical	8	5	5,540
		Subtotal	77	19	17,079
	Total		337	61	52,641
Grand	Total		359	69	55,143

### (B) Classification of Irrigation Area by Irrigation System in Study Area

Irrigation System						100	No.	of S	che	mes		No	. of	Sche	mes		E	cisti	ng F	aoc	y Field
		44.5%			· 	 	1	- 1		100	no	t yet	read	ched	to Ta	ırqet		40.	(	ha)	· .
Simple	, è s			1.1						251	1.7			11.	, X,	46		37.7			24,513
Semi-technical	1	100				 				97			: .	1,344		17		777	-	S. J.	19,560
Technical	:						1	. 117		11					100	6		-:-	72.7		11.070
Total	7.1		_, .			 				359						69				1100	55,14

### 2. Riau Province

### (A) Classification of Irrigation System by Districts

	District	Irrigation System	No. of Schemes	No. of Schemes not yet reached to Target	Existing Paddy Field (ha)
1. Kampar River	Kampar	Semi-technical	29		
Basin	Indragiri Hu	Semi-technical	6	6	9
		Total	35	35	4,141
2. Indragiri River Basin	Indragiri Hu	Semi-technical	24	23	
	Grand Total		59	58	7,451

Table VII.1.4 DEFINITION OF IRRIGATION SYSTEM

Items		Classification of Irrigation System	
	(1) Simple Irrigation System	(2) Semi-technical Irrigation System	(3) Technical Irrigation System
1). Headworks	Temporary structure	Permanent or semi-permanent	Permanent structure
		structure	
2). Capacity of structures to measure	Poor	Fair	Good
and regulate discharge			
3). Canal system	Irrigation and drainage are	Irrigation and drainage are not	Irrigation and drainage are
	combined	completely separated	separated
4). Tertiary system	No tertiary system developed	ertiary system developed Not developed or with low tertiary	Fully developed
	yet	structure density	
5). Overall efficiency	Less than 40 %	40-50 %	20-60 %
6) Size	Not more than 500 ha	Up to 2,000 ha	No limit

Source : Irrigation Design Standard published by Directorate General of Water Resources Development, Ministry of Public Works

### Table VII.1.5 VILLAGE IRRIGATION PROJECTS IN STUDY AREA

### 1. West Sumatra Province

Basin	District	No. of Projects	Gross Area (ha)	Existing Irrigated Paddy Field (ha)
A. Kampar Basin	1) Limapuluh Kota	28	702	702
B. Indragiri Basin	1) Limapuluh Kota	338	10,263	10,263
	2) Agam	11	395	395
	3) Tanah Datar	686	7,801	7,801
	4) Sijunjung	166	4,289	4,289
	5) Solok	162	5,886	5,266
	Subtotal	1,363	28,634	28,014
Total		1,391	29,336	28,716

### 2. Riau Province

Basin	District	No. of Projects	Gross Area (ha)	Existing Irrigated Paddy Field (ha)
A. Kampar Basin				
(1) Kampar Kanan River	Kampar	4	270	20
(2) Kampar Kiri River	Kampar	1	185	5
	Indragiri Hulu	2	175	35
(3) Kampar Main Stream	Kampar	6	830	152
	Subtotal	13	1,460	212
B. Indragiri Basin	Indragiri Hulu	10	1,350	348
Total		23	2,810	560

Table VII.1.6 EXISTING SWAMP DEVELOPMENT PROJECTS IN STUDY AREA IN RIAU PROVINCE

1		ø.			Ö	<u>ლ</u>	6	9	0	ဖြ	4	 Ol	<b>₩</b>	ග
Unit : ha	No. of	Households	at Present			1,593	1,593	1,316	1,380	2,696	50,624		50,624	54,913
	Estimated	Remaining	Potential Area	(A)-(F)	0	2,120	2,120	3,596	1,498	5,094	29,360	0	59,360	66,574
	Subtotal		Œ	(B)+(C)+(D)+(E)	0	898	868	4,023	2,108	6,131	187,694	. 0	187,694	194,723
	Others	including	Fish Pond	(E)	0	123	123	0	0	0	5,138	0	5,138	5,261
	Existing	Plantation		(D)	0	20	09	0	30	06	133,616	0	133,616	133,696
	Existing	Upland Field		(C)	0	81	18	1,678	275	1,953	10,417	0	10,417	12,451
	Existing	Paddy Field		(B)	0	644	644	2,345	1,803	4,148	38,523	0	38,523	43,315
	Potential	Area		€	0	3,018	3,018	7,619	3,606	11,225	74 247,054	0	74 247,054	261,297
	No. of Pot	Projects			0	9	6	2	5	7	74	0	74	84
	Classification of	Project	(Tidal or Non-tidal)		(a) Tidal Irritgation	(b) Non-tidal Irrigation	Subtotal	2. Indragiri (a) Tidal Irritgation	(b) Non-tidal Irrigation	Subtotal	3. Indragiri (a) Tidal Irritgation	(b) Non-tidal Irrigation	Subtotal	Total
	District				1. Kampar			2. Indragiri	Holu		3. Indragiri			

INVENTORY DATA BASE OF IRRIGATION SCHEMES, SWAMP AND EXISTING LAND USE IN RIAU PROVINCE DATA PROCESSING RESULT INVENTORY PROJECT OF IRRIGATION SCHEMES, SWAMP AND EXISTING LAND USE IN RIAU PROVINCE 1992/1993

Sources:

## Table VII.3.1(1/2) FUTURE IRRIGATION DEVELOPMENT PLAN FORMULATED BY P.U. IN RIAU PROVINCE

1. Potential Areas (Not identified Yet)

Scheme Name	Planned	Level of	Facility	Existing	Existing	Irrigable Are	a at Present	Estimated	Catchment	Year to be
	Gross Irrigable	Existing	Abstracting	Irrigated	Rain-fed	Dry Season	Dry Season Wet Season	Remaining	ing Area Completed	Completed
	Area	Irrigation	Water for	Paddy Field	Paddy Field			Potential Area	:	
	(€)	System	Existing System	<u></u>	<u></u>			(A)-(B)-(C)		
. Hantauberangin	40,000								250,000	
2. Gunung Sallan	5,000								35,000	
. Punggal Lipat Kain	10,000								70,000	
Total	55,000								355,000	

B. Indragiri River Basin									-	Unit: ha
Scheme Name	Planned	Level of	Facility	Existing	Existing	irrigable Area at Present	a at Present	Estimated	Catchment	Year to be
	Gross Irrigable	Existing	Abstracting	Irrigated	Rain-fed	Dry Season	Wet Season	Remaining	Area	Completed
	Area	Irrigation	Water for	Paddy Field	Paddy Field			Potential Area		: . :. :
	(A)	System	Existing System	(B)	(C)		-	(A)-(B)-(C)		
1. Lubukjambi	20,000								270,000	
2. Cinaku Bt. Papan	8,000								40,000	
3. Gangsal	4,000								16,000	
4. Reteh	4,000								18,000	
5. Keritang	000,1								2,000	
6. Kuko	1,000								4,500	
Total	000'89								353,500	:

Data Sources: Location of Irrigation Development Areas in Riau by PU in Riau

Table VII.3.1(2/2) FUTURE IRRIGATION DEVELOPMENT PLAN FORMULATED BY P.U. IN RIAU PROVINCE

2. Potential Areas (Identified)

<ul> <li>A. Kampar River Basin</li> </ul>										Unit: ha	
Scheme Name	Planned	Level of	Facility	Existing	Existing	Irrigable Are	rrigable Area at Present	Estimated	Catchment	Year to be	
	Gross Irrigable	Existing	Abstracting	Irrigated	Rain-fed	Dry Season	Dry Season   Wet Season	Remaining	Area	Completed	
	Avea	Irrigation	Water for	Paddy Field	Paddy Field			Potential Area			
	(A)	System	Existing System	(B)	(2)			(A)-(B)-(C)			
None	0										

B. Indragiri River Basin					- 1	-				Unit: ha
Scheme Name	Planned	Level of	Facility	Existing	Existing	Irrigable Are	Irrigable Area at Present	Estimated	Catchment   Year to be	Year to be
	Gross Irrigable	Existing	Abstracting	Irrigated	Rain-fed	Dry Season	Dry Season   Wet Season	Hemaining	Area	Completed
	Area	Irrigation	Water for	Paddy Field	Paddy Field			Potential Area		
	€	System	Existing System	<u>@</u>	<u></u>			(A)-(B)-(C)	-	
1. Sei Putihan	200								4,200	
2. Air Molek	9,100								40,000	
3. Kayu Aru	1,400								8,400	
4. Perariap	15,000					:	1.		35,200	
5. Singingi	006'9								37,800	•
6. Cinaku Hulu	000'9	1						٠.	62,500	
7. Cinaku Tengah	4,000					-			32,000	
Total	42,500								220,100	-

Data Sources: Location of Irrigation Development Areas in Riau by PU in Riau

Table VII.3.2 SUMMARY OF BASIC FEATURES AND PRINCIPAL COMPONENTS OF NEW IRRIGATION DEVELOPMENT PROJECTS

Future Irrigation Development Projects	(A) Rantauberangin	(B) Lubukjambi
	Irrigation Development Project	Irrigation Development Projec
(1) River Basin	Kampar Kanan River Basin	Indragiri River Basin
(2) Irrigation Method to be	Gravity Irrigation	Gravity Irrigation
applied		
(3) Irrigation System to be	Technical Irrigation	Technical Irrigation
applied	System	System
(4) Intake Facilities	Kuok Intake Weir	Lubukjambi Intake Weir
-Weir Crest Elevation	EL. 40m	EL. 60m
(5) Primary Canal Length		
- Left Bank Primary Canal	84 km	119 km
- Right Bank Primary Canal	40 km	123 km
Subtotal	124 km	242 km
(6) Project Area	40,000 ha	50,000 ha
estimated by PU, Riau Province		
(7) Irrigable Area		
(7-1) Existing Irrigation Schemes to		
be incorporated		
(a) Left Bank Area	(10 schemes)	(12 schemes)
Existing Irrigated Area	1,837 ha	1,670 ha
Convertible Area to Irrigation		
2-1. Rainfed	553 ha	376 ha
2-2. Undeveloped yet	2,781 ha	2,096 ha
Total Area	5,171 ha	4,142 ha
(b) Right Bank Area	(12 schemes)	(8 schemes)
Existing Irrigated Area	1,822 ha	1,515 ha
Convertible Area to Irrigation		
2-1. Rainfed	375 ha	65 ha
2-2. Undeveloped yet	2,141 ha	650 ha
Total Area	4,338 ha	2,230 ha
Subtotal	9,509 ha (22 schemes)	6,372 ha (20 schemes)
(7-2) Existing Drainage and Swamp		
Development Schemes		
to be incorporated		
- Left Bank Area	2,975 ha (4 schemes)	
- Right Bank Area	<u> </u>	<u> </u>
Subtotal	2,975 ha (4 schemes)	
(7-3) Net Additional Area		
- Left Bank Area	10,517 ha	12,875 ha
- Right Bank Area	277 ha	10,902 ha
Subtotal	10,794 ha	23,777 ha
(7-4) Total Net Irrigable Area		
- Left Bank Area	15,688 ha	17,017 ha
- Right Bank Area	4,615 ha	13,132 ha
Subtotal	20,303 ha	30,149 ha

Note (7-3) Net Additional Area

the net area including the existing drainage and swamp development schemes, if any, and excluding the

existing irrigation schemes.

(7-4) Total Net Irrigable Area:

the total net irrigable area includes all the existing schemes.

## Table VII.3.3 (1/3) EFFECTIVE RAINFALL IN RANTAUBERANGIN, LUBUKJAMBI, AND WEST SUMATRA REGION IN STUDY AREA

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### 1) Rantauberangin

Vear         Jan.         Feb.         Mar.         Apr.         May           1-15         16-31         1-15         1-15         1-15         1-15 <th></th> <th>Unit: mm/day</th> <th>m/day</th>												Unit: mm/day	m/day
1-15         16-31         1-15         16-15         16-15         16-31         1-15         16-31         1-15         16-31         1-15         16-31         1-15         16-31         1-15         16-31         16-31         16-31         16-31         16-31         16-31         16-31         16-31         16-31         16-31         3.6         16-31         16-31         3.6         16-31         16-31         3.6         3.1         16-31         16-31         3.6         3.1         16-31         3.6         3.1         16-31         3.1         3.6         3.1         3.1         3.1         3.1         3.1         3.1         3.1         3.1         3.1         3.1         4.6         8.6         3.1         4.7         4.8         8.6         8.6         9.6         8.6         9.6         8.6         9.6	Year	٦ ا	an.	Fe	b.	Ň	ar,	Ā	or.	Σ	ay	]	June
3.1       4.0       4.5       4.5       3.1       3.3       14.3       4.9       11.1         3.0       0.7       4.8       2.3       5.4       10.2       11.5       9.1       12.5         2.7       3.2       2.8       1.6       5.8       4.3       3.3       5.9       11.1       4.4         9.3       2.9       4.1       4.9       7.2       5.9       5.6       1.4       4.4         9.3       2.2       5.8       0.3       6.3       5.5       1.5       5.1       4.0         8.6       4.0       5.0       0.5       12.0       6.3       5.5       1.5       5.1       4.0         3.9       3.3       2.7       8.2       6.5       4.7       7.0       5.4       1.3       4.2       4.7       7.0         4.8       9.6       8.0       3.3       5.6       5.1       6.9       2.0       5.6         2.0       3.1       10.5       2.8       2.3       3.9       5.9       5.9         2.0       3.1       10.5       2.8       2.3       3.9       5.9       5.9         2.4       3.1       4.2		1-15	16-31	1-15	16-28	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30
3.0         0.7         4.8         2.3         5.4         10.2         11.5         9.1         12.5           2.7         3.2         2.8         1.6         5.8         4.3         3.3         5.9         17.5           1.9         2.9         4.1         4.9         7.2         5.9         5.6         1.4         4.4           9.3         2.2         5.8         4.3         5.5         5.1         4.9         4.4	1981		4.0		4.5	3.1	3.3	171	4.9	11.1	3.6	3.2	0.0
2.7     3.2     2.8     1.6     5.8     4.3     3.3     5.9     3.1       1.9     2.9     4.1     4.9     7.2     5.9     5.6     1.4     4.4       9.3     2.2     5.8     0.3     6.3     2.5     5.1     3.1     4.0       8.6     4.0     5.0     0.5     12.0     6.3     5.5     1.5     5.1       3.9     3.3     2.7     3.1     5.8     2.7     6.5     4.7     7.0       4.8     9.6     8.0     3.3     5.6     5.1     6.9     4.7     7.0       2.0     3.1     10.5     2.8     2.3     3.4     5.9     3.3     5.9       2.0     3.1     10.5     2.8     2.3     3.4     5.9     3.9     5.9       2.4     3.1     1.5     0.4     10.2     11.6     6.3     3.9     5.9       2.4     3.1     1.5     0.4     10.2     11.6     6.3     5.9     0.1     4.9	1982	S		4.8	2.3	5.4	10.2			12.5		6.7	0.0
1.9     2.9     4.1     4.9     7.2     5.9     5.6     1.4     4.4       9.3     2.2     5.8     0.3     6.3     2.5     5.1     3.1     4.0       8.6     4.0     5.0     0.5     12.0     6.3     5.5     1.5     5.1       3.9     3.3     2.7     3.1     5.8     2.7     6.5     4.7     7.0       4.8     9.6     8.0     3.3     5.6     5.1     6.9     2.0     5.6       12.4     6.8     1.4     7.6     5.4     1.3     4.2     1.7     3.3       2.0     3.1     10.5     2.8     2.3     3.4     5.9     3.9     5.9       2.4     9.1     1.5     0.4     10.2     11.6     6.3     5.0     5.2       5.6     6.9     7.9     4.3     7.0     2.3     5.9     0.1     4.9	1983			2.8	1.6	5.8	4.3	3.3	5.9	3.1	1.4	2.1	0.0
9.3         2.2         5.8         0.3         6.3         2.5         5.1         3.1         4.0           8.6         4.0         5.0         0.5         12.0         6.3         5.5         1.5         5.1           3.9         3.3         2.7         3.1         5.8         2.7         6.5         4.7         7.0           4.8         9.6         8.0         3.3         5.6         5.1         6.9         2.0         5.6           2.0         3.1         10.5         2.8         2.3         3.4         5.9         3.3         5.9           2.4         3.1         10.5         2.8         2.3         3.4         5.9         3.9         5.9           2.4         3.1         1.5         0.4         10.2         11.6         6.3         5.0         5.9           2.4         3.1         5.9         4.3         7.0         2.3         5.9         0.1         4.9	1984			4.1	4.9	7.2	5.9	5.6	4.	4.4	6.8	9.2	1.8
8.6         4.0         5.0         0.5         12.0         6.3         5.5         1.5         5.1           3.9         3.3         2.7         3.1         5.8         2.7         6.5         4.7         7.0           4.8         9.6         8.0         3.3         5.6         5.1         6.9         2.0         5.6           12.4         6.8         1.4         7.6         5.4         1.3         4.2         1.7         3.3           2.0         3.1         10.5         2.8         2.3         3.4         5.9         3.9         5.9           2.4         9.1         1.5         0.4         10.2         11.6         6.3         5.0         5.2           5.6         6.9         7.9         4.3         7.0         2.3         5.9         0.1         4.9	1985			5.8	0.3	6.3	2.5	5.1	3.1	4.0	9.9	0.7	0.0
3.9     3.3     2.7     3.1     5.8     2.7     6.5     4.7     7.0       4.8     9.6     8.0     3.3     5.6     5.1     6.9     2.0     5.6     5       2.0     3.1     10.5     2.8     2.3     3.4     4.2     1.7     3.3     5       2.0     3.1     10.5     2.8     2.3     3.4     5.9     3.9     5.9     5.9       2.4     3.1     4.3     7.0     2.3     5.9     0.1     4.9     2.2	1986			5.0	0.5	12.0	6.3	5.5	1.5		1.2	1.7	3.6
4.8         9.6         8.0         3.3         5.6         5.1         6.9         2.0         5.6           12.4         6.8         1.4         7.6         5.4         1.3         4.2         1.7         3.3           2.0         3.1         10.5         2.8         2.3         3.4         5.9         5.9           2.4         9.1         1.5         0.4         10.2         11.6         6.3         5.0         5.2           5.6         6.9         7.9         4.3         7.0         2.3         5.9         0.1         4.9	1987			2.7	3.1	5.8	2.7	6.9	4.7	7.0	1.5	5.3	0,3
12.4         6.8         1.4         7.6         5.4         1.3         4.2         1.7         3.3           2.0         3.1         10.5         2.8         2.3         3.4         5.9         3.9         5.9           2.4         9.1         1.5         0.4         10.2         11.6         6.3         5.0         5.2           5.6         6.9         7.9         4.3         7.0         2.3         5.9         0.1         4.9	1988		٠.	8.0	3.3	5.6	5.1	6.9	2.0		5.6	6.2	5.0
2.0     3.1     10.5     2.8     2.3     3.4     5.9     3.9     5.9       2.4     9.1     1.5     0.4     10.2     11.6     6.3     5.0     5.2       5.6     6.9     7.9     4.3     7.0     2.3     5.9     0.1     4.9	1989			1.4	9.7	5.4	1.3	4.2	1.7		2.8	0.0	4.3
2.4     9.1     1.5     0.4     10.2     11.6     6.3     5.0     5.2       5.6     6.9     7.9     4.3     7.0     2.3     5.9     0.1     4.9	1990			10.5	2.8	2.3	3.4	5.9	3.9	5.9	1.8	1.4	5.0
5.6 6.9 7.9 4.3 7.0 2.3 5.9 0.1 4.9	1991	2.4		1.5	0.4	10.2	11.6		5.0	5.2	2.9	1.3	1.4
	1992	2		7.9	4.3	7.0	2.3	5.9		4.9	2.8	1.4	1.6

ſ												
Year	ゔ	July	Aug.	Ď.	Sep	de.	Oct	++	Nov	<u>`</u>	<u>ద</u>	Dec.
	1-15	16-31	1-15	16-31	1-15	16-30	1-15	16-91	1-15	16-30	1-15	16-31
1981	4.8	2.9	0.0	3.4	2.7	1.2	4.0	9.6	3.8	3.1	7.4	3.5
1982	3.5	1.8	5.3	3.7	2.7	2.1	5.7	1.6	2.1	3.6	2.6	9.6
1983	3.3	2.6	0.4	3.7	6.6	2.5	2.8	4.0	5.7	3.9	5.2	7.1
1984	0.9	11.6	4.0	2.7	5.9	4.1	3.1	5.8	2.0	3.9	4.3	7.0
1985	1.8	0.1	0.7	2.9	1.5	2.1	11.0	15.1	12.2	7.	8.7	3.3
1986	1.6	4.7	0.0	1.1	1.0	0.7	10.1	6.2	0.9	10.3	10.8	6.4
987	1.3	2.2	4.4	0.0	5.3	5.4	8.7	7.0	9.6	2.2	10.5	3.1
1988	2.4	2.4	2.8	10.0	1.4	0.9	1.4	3.2	6.5	3.5	10.4	7.5
1989	3.7	1.8	1.4	2.8	5.3	3.2	6.3	9.5	9.9	3.1	6.9	5.2
990	2.5	6.9	2.0	4.6	1.7	2.9	3.9	9.5	7.6	9.4	9.5	3.8
1991	2.1	0.0	3.7	2.8	2.4	44	1.9	9.7	9.6	8.2	5.3	8.1
1992	4.6	4.2	2.0	1.2	4.6	4.0	6.2	4.3	5.2	8.9	4.4	3.8

### Table VII.3.3 (2/3) EFFECTIVE RAINFALL IN RANTAUBERANGIN, LUBUKJAMBI, AND WEST SUMATRA REGION IN STUDY AREA

### 2) Lubukjambi

Jan. Jan. 7.0 6 9.1 10.9 8 8.7 5.6 5.6 5.1 10.5 5.6 5.1 10.5 5.6 5.1 10.5 5	7-15 1 6.4								•	
1-15 16- 7.0 9.1 7.6 1 6.0 10.9 8.7 5.6 1.0 1.0 1.0 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	1-15		Mar.		Apr	۲.	Σ	May	3	June
7.0 9.1 7.6 10.9 1.0 1.0 1.0	6.4	16-28	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30
9.1 7.6 6.0 10.9 8.7 8.7 5.6 1.0		6.4	6.8	4.7	13.8	6.4	4.5	5.6	3.3	1.7
7.6 1 6.0 10.9 8.7 5.6 1.0 10.5	5.6	2.7	6.3	11.8	21.7	8.7	8.4	5.4	4.9	0.0
6.0 10.9 8.7 5.6 10.5	4.1	3.5	6.9	3.5	2.4	2.3	16.2	9.9	3.4	5.4
10.9 8.7 5.6 1.0 10.5	5.5	9.5	8.3	9.0	13.2	3.7	9.5	5.9	8.4	2.8
8.7 5.6 1.0 10.5	3.1	0.5	9.5	6.0	2.7	3.0	8.4	5.2	1.3	9.0
5.6 1.0 10.5	3.5	0.8	9.8	5.8	5.5	14.9	8.5	0.0	2.7	1.2
1.0 10.5 1.5	4.7	0.3	7.2	2.3	9.0	2.9	6.4	3.5	3.7	3.5
10.5 5 1.5 3	1.9	5.1	7.4	2.2	4.9	1.1	9.8	2.9	4.3	0.8
1.5 3	2.7	4.3	4.6	7.6	4.0	2.2	8.0	3.3	2.6	2.0
	2.1	4.4	6.9	2.6	6.8	1.1	11.4	1.8	0.5	1.0
1991   10.0   7.8	3.9	5.2	4.2	11.2	8.9	2.4	2.9	4.4	2.5	1.7
1992 4.4 7.9	7.5	2.3	6.4	2.7	3.5	4.4	3.3	1.8	3.3	2.3

	<u>.                                    </u>			1	-	, [72	T#:	1 ==	T ==				·	,
Dec.	16-31	3.9	10.1	7.4	4.9	11.6	5.2	1.4	1.9	7.2	11.3	12.2	5.6	
۵	1-15	4.0	7.3	5.0	4.9	9.1	12.4	3.4	7.7	15.7	10.3	7.4	4.1	
>	16-30	2.8	1.0	5.6	4.7	2.7	12.6	4.2	2.0	9.8	3.5	10.8	9.0	
Nov.	1-15	8.3	10.8	9.3	4.5	4.2	4.4	7.1	2.8	10.3	2.4	14.2	11.8	
نب	16-31	2.5	4.9	5.3	5.5	5.3	6.6	4.3	1.5	2.3	4.7	1.9	4.0	
Oct	1-15	8.5	6.9	4.6	9.7	7.6	8.4	3.6	2.2	5.5	2.1	0.4	5.1	
<u>.</u>	16-30	5.8	0.7	0.5	6.1	5.7	9.5	2.7	3.2	9.0	2.0	1.4	6.2	_
Sep.	1-15	7.3	0.0	5.3	3.6	2.7	3.3	3.1	1.6	4.9	4.6	1.6	2.3	100°
	16-31	0.3	2.6	4.6	5.6	3.5	0.7	1.1	0.4	4.5	5.5	0.0	1.4	1088
Aug.	1-15	0.0	4.7	4.6	3.7	0.4	0.0	3.5	5.5	0.7	0.4	4.0	9.0	2r 1084
<u></u>	16-31	4.5	1.0	3.9	2.9	3.1	3.2	2.2	0.7	0.0	5.6	1.1	5.3	1002 Pag 1084 1089 and 1002
July	1-15	4.4	3.5	6.8	2.7	4.2	3.5	1.1	1.4	3.0	4.3	1.5	3.6	Note
Year		1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	

## Table VII.3.3 (3/3) EFFECTIVE RAINFALL IN RANTAUBERANGIN, LUBUKJAMBI, AND WEST SUMATRA REGION IN STUDY AREA

1

3) West Sumatra Region

10					٠.					٠				-	
n/day	96	16-30	1.0	1.7	1.3	1.0	0.7	0.8	1.7	1.7	3.5	2.2	1.4	0.6	
Unit: mm/day	June	1-15	1.9	5.1	3.3	6.2	1.0	2.7	1.9	4.2	0.7	1.5	2.8	1.9	
	ıy.	16-31	6.2	6.1	1.9	5.7	4.6	2.7	2.4	1.2	1.8	1.1	4.8	5.9	
	May	1-15	7.7	5.6	7.0	5,4	5.4	3.6	12.1	9.1	6.0	7.4	5.2	7.4	
	ır. [	16-30	6.4	7.4	6.4	3.4	1.9	5.1	8.4	5.5	1.0	2.2	3.1	4.6	
	Apr	1-15	8.0	9.0	3.4	9.8	4.8	4.5	5.0	5.5	4.6	3.7	8.2	5.8	
	Jr.	16-31	3.8	4.5	3.6	6.4	4.9	0.9	7.2	4.4	5.4	6.9	9.6	4.6	
	Mar	1-15	5.3	5.0	4.2	4.8	6.0	12.9	6.4	10.0	2.4	2.6	4.3	6.5	
	Ď.	16-28	3.2	3.1	5.3	3.2	0.5	1.1	2.6	6.9	8.4	5.8	1.3	4.7	
	Feb.	1-15	4.5	5.5	3.7	5.0	6.2	2.9	2.3	2.7	3.5	6.8	4.0	4.0	
<b>)</b>	n.	16-31	3.4	2.9	4.1	4.9	4.3	2.0	3.4	9.8	8.3	4.8	7.1	6.1	
	Jan.	1-15	2.0	5.0	6.3	7.2	4.9	11.9	4.6	4.2	7.2	3.1	5.4	2.9	
	Year		1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	

	٦ ا	July	Aug	G	Sep.	Ğ.	Ó	Oct.	ž	Nov.	<u>പ്</u>	Dec.
	1-15	16-31	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31
1981	3.4	2.7	0.0	1.1	6.2	2.2	7.4	7.4	2.5	3.1	4.8	4.0
1982	1.7	1.3	2.1	2.1	2.1	2.5	5.2	2.9	5.6	5.3	6.0	6.6
1983	3.3	3.0	2.6	2.7	5.1	2.5	5.8	3.7	2.7	1.9	3.8	4.4
1984	3.0	4.6	0.5	1.9	2.2	4.6	0.9	3.6	8.1	8.8	2.9	6.0
1985	1.1	2.8	2.2	2.7	2.9	5.4	3.9	4.6	9.8	1.4	3.4	4.1
.1986	2.1	2.9	0.5	2.6	2.5	4.5	5.4	5.3	1.7	4.6	8.4	4.1
1987	2.1	2.0	3.4	2.6	2.1	3.1	6.5	5.9	6.4	2.1	4.8	4.9
1988	3.0	1.1	3.5	8.0	7.0	5.0	1.5	2.3	2.5	6.4	4.5	3.5
1989	1.8	9.0	1.8	4.2	3.5	9.9	4.7	5.5	9.4	6.8	7.4	4.9
1990	4.0	3.2	0.5	0.8	3,4	3.7	6.5	6.8	3.5	9.8	7.1	5.3
1991	2.3	1.5	3.0	1.8	2.2	2.7	0.8	5.0	5.1	14.8	11.3	14.8
1992	4.7	6.0	1.0	1.7	3.5	5.7	4.2	1.7	10.7	11.4	6.0	5.0

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### Table VII.3.4 METEOROLOGICAL DATA USED FOR CALCULATION OF REFERENCE CROP EVAPOTRANSPIRATION (Etb)

### 1. Kampar River Basin

Ovservation Station : Pasar Kampar

Ovservation Period: 1980-1993 (14 years)

Month	Daily Average			umidity	Wind V	1	Sunshine	
			(9	%)	(km/c	lay)	(%)	)
	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
Jan.	27.9	27.7	81.7	80.6	23.2	29.3	28.6	28.9
Feb.	28.0	28.4	80.0	78.9	24.8	27.9	32.6	42.7
Mar.	28.2	28.7	80.2	79.1	24.9	26.1	29.4	36.2
Apr.	28.7	29.0	79.3	79.1	25.7	26.6	38.4	46.2
May	28.8	28.9	83.0	80.0	28.5	27.2	41.9	41.9
June	28.8	28.9	78.1	77.1	28.4	25.3	45.0	45.4
July	28.3	28.3	78.1	77.1	30.9	26.2	37.6	39.1
Aug.	28.2	28.5	77.3	76.9	29.3	30.9	35.1	28.0
Sep.	28.2	28.2	84.5	79.3	31.8	28.2	28.3	27.3
Oct.	28.2	28.4	79.0	82.6	32.5	28.0	29.5	
Nov.	28.3	28.2	79.0	79.7	23.0	24.5	32.9	34.1
Dec.	27.2	27.6	81.0	88.6	25.5	24.5	29.4	24.2

### 2. Indragiri River Basin

Ovservation Station: Sentajo

Ovservation Period: 1979-1993 (15 years)

Month	Daily Average			umidity %)	Wind Vo		Sunshine (%	
	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
Jan.	26.5	26.5	87.1	86.4	50.2	50.9	32.4	30.0
Feb.	27.2	27.5	77.8	77.3	46.5	45.4	40.2	44.8
Mar.	27.2	27.2	77.8	77.1	43.8	43.6	33.8	42.3
Apr.	27.1	27.2	76.6	76.4	43.3	43.7	43.3	47.4
May	27.7	28.0	83.8	84.2	44.9	44.8	48.2	41.7
June	27.5	27.3	86.8	85.7	43.7	44.4	30.7	30.1
July	27.2	27.2	83.9	84.3	43.9	45.6	35.2	43.0
Aug.	27.3	27.4	83.2	84.4	44.8	41.8	44.7	47.2
Sep.	27.0	27.1	84.9	85.8	43.1	43.5	39.3	39.0
Oct.	27.3	27.9	76.8	77.0	41.2	42.8	38.2	34.6
Nov.	27.1	27.0	68.3	68.4	37.9	43.3	39.4	40.4
Dec.	26.5	26.7	70.0	70.6	43.2	39.5	33.0	33.6

Note: Data which are not available at Sentajo staition durning the following months were supplemented with data at Peranap station.

1) Daily	AVE	rage	Temperatu	ıre
		- 11 -		

### 2) Sunshine Ratio

1983	B May, Aug., Sep., Oct., 1990 Fet	. Mar. Apr. Nov. and Dec.
		. Feb. Mar. and Oct.
1984	l One year data 1992 On	e year data
1985	Jan., Feb., and Mar.	
1988	Nov., and Dec.	
1989	Nov.,and Dec.	
1990	Jan., Feb., Mar., Apr., May,	
	June, July, Nov., and Dec.	

	Jan		Feb.		Mar.	۳.	¥	Apr.	M	May	June	و
DATA and CALCULATION		2		2	-	2	-	2	-	2	-	12
Data: () Calculation												'
ြဝ												
Tmax ( ) (C) with the control of the												
									Į.	1		
Jmean (℃)	27.90	27.70	28.00	28.40	28.20	28.70	28.70	29.00	28.80	28.90	28.80	28.90
								<u>.</u>				
Rel:Hum(mean) (%)		80.60	80.00	78.90	80.20	79.10			l			77.10
ır pr		37.20		38.70	38.30	39.40						39.90
U2: Total wind run at 2m height (km/day)	23.20	29.30	2	27 90	24.90	26.10					28.40	25.30
10]. (1-W): Weighting factor	0.23	0.23	0.23	0.23	0.23	0.23					0.23	0.23
	0.77	0.77	0.77	0.77	0.77	0.77					0.77	0.7
12]. n/N: Sunshine ratio (%)		28.90	32.60	42.70	29.40	36.20	38.40	46.20	<b> </b>	41.90	45.00	45.40
. N: Bright sunshine hours (hours)	12.10	12.10	12.10	12.10	12.10	12.10	12.10	12.10	12.10	12.10	12.10	12.10
. Ra. Extra-terrestrial radiation (mm/day)	15.00	15.00	15.50	15.50	15.60	15.60	15.30			}		14.00
15]. f(t): Correction for temp. on longwave rad. Rnl		16.20	16.30	16.40	16.30	16.40	16.40					16.50
vapou		29.98	30.24	30.53	30.72	31.17	31.24		(3)	E	30.93	30.76
Vaper Pressure=ea-ed (mbar)	6.88	7.22	7.56	8.17	7.58	8.23	8.16	8.38	6.73	7.98	8.67	9.14
18). f(u): Wind related function f(u)=0.27(1+U2/100)	0.33	0.35	0.34	0.35	0.34	0.34		0.34	0.35			
n: Sunshine (hours)	3.46	3.50	3.94	5.17	3.56	4.38	4.65	5.59	5.07	5.07	5.45	5.49
(20). Rns: Net shortwave radiation (mm/day) Rns=[1-a]*[0.25+0.50*(n/N)]*Ra (a=0.25)	4.42	4.44	4.80	5.39	4.64	5.04	5.07		4.96	4.96	4.99	w
.f(ed): Correctfor v. press. on t.wave rad. Rnl	0.12	0.13	0.13	0.12	0.12	0.12		0.12			0.12	0.12
(22), f(n/N): Correc.for ratio actual and max.bright sunshine hours f(n/N) on I.wave rad.Rnl	0.36	0.36	0.39	0.48	0.36	0.43	0.45	0.52	0.48	0.48	0.51	0
(mm/day) (mm/day) (mm/day) (mm/day) (mm/day) (mm/day)	0.70	0.76		0.94	0.70	0.85	0.89				1.01	1.01
. Rn: Net radiation=Rns-Rnl (mm/day)	3.72	3.68	3.97	4.45	3.94	4.19	4.18	4.49	4.09		3.98	4.00
(25). Eto*: Reference crop evapotranspiration unadjusted for day and night-time												
u)*(ea-ed)	3.39	3.41	3.65	4.08	3.63	3.87	3.86	4.16	3.69	3.77	3.76	3.79
1									<u> </u>			
Eto Eto=Eto* (No adjustment of Penman Eto*)		3,41	3.65	4.08	3.63	3.87	3.86			4 4	4.16 3.69	4.16 3.69 3.77

# Table VII.3.5 (2/4) CALCULATION OF REFERENCE CROP EVAPOTRANSPIRATION (Eto) BY MODIFIED PENMAN METHOD

1. Rantauberangin Irrigation Development Project (July - Dec.)

	7911	ľ	, iv		200		ځ		N		ć	
	July	1	Since	. 1	2	- 1	5			. 1	טפר.	- 1
DATA and CALCULATION	<b>,</b>	5	-	2	-	2	-	2	-	2	-	7
[ ]: Data, (): Calculation			*** *** * *									1
[1]. Latitude 0"20' N (Project Site Elevation: 25m)												
[2] Tmax												
(3) Tmin	<u> </u>											
(4). Tmean (°C)	28.30	28.30	28.20	28.50	28.20	28.20	28.20	28.40	28.30	28.20	27.20	27.60
[5]. Rel. Hum(max) (%)												
[6] Rei Hum(min) (%)												
(7). Hel. Hum(mean) (%)		77.10	77.30	76.90	84.50	79.30	79.00	82.60	79.00	79.70	81.00	88.60
[8] ea: Mean saturation water vapour pressure (mbar)	38.50	38.50	38.30	39.00	38.30	38.30	38.30	38.70	38.50	38.30	36.10	37.00
[9]. U2: Total wind run at 2m height (km/day)		26.20	29.30	30.90	31.80	28.20	32.50	28.00	23.00	24 50	25.50	24.50
[10]. (1-W): Weighting factor	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.24	0.23
	Ľ	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.76	0.77
[12]. n/N: Sunshine ratio (%)		39.10	35.10	28.00	28.30	27.30	29.50	32.40	32.90	34.10	29.40	24.20
[13]. N. Bright sunshine hours (hours)	12.10	12.10	12.10	12.10	12.10	12.10	12.10	12.10	12.10	12.10	12.10	12.10
[14]. Ra: Extra-terrestrial radiation (mm/day)	14.10	14.10	14.80	14.80	15.30	15.30	15.40	15.40	15.10	15.10	14.70	14.70
[15]. f(t): Correction for temp, on longwave rad. Rnl	16.40	16.40	16.30	16.40	16.30	16.30	16.30	16.40	16.40	16.30	16.10	18.20
(16). ed: Mean actual water vapour pressure (mbr)	30.07	29.68	29.61	29.99	32.36	30.37	30.26	31.97	30.42	က	29.24	32.78
(17): Vaper Pressure=ea-ed (mbar)	8.43	8.82	8.69	9.01	5.94	7.93	8.04	6.73	8.08	777	98.9	4.22
((18): f(u): Wind related function												
f(u)=0.27(1+U2/100)	0.35	0.34	0.35	0.35	0.36	0.35	0.36	0.35	0.33	0.34	0.34	0.34
(19). n. Sunshine hours)	4.55	4.73	4.25	3.39	3.42	3.30	3.57	3.92	3.98	4.13	3.56	2.93
			i		(			- ·		•	,	
	4.63	5	4 (2	4.33	4.48	4.40	4 55	4.6	4.69	4.76	4.38	4.09
(21). f(ed): Corrector v. press. on I.wave rad. Rnl	0.13	0.13	0.13	0.13	0.11	0.12	0.13	0.11	0.12	0.12	0.13	0.11
(22): f(n/N): Correc for ratio actual and max bright sunshine hours f(n/N) on I wave rad Bril	0.44	0.45	0.42	0.35	0.35	0.35	0.37	0.39	0.40	0.41	0.38	0.32
(23). Rnl: Net longwave radiation (mm/day)												
Bni=f(t)*f(ed)*f(n/N)	0.94	96.0	0.89	0.75	0.63	0.68	0.78	0.70	0.79	0.80	0.75	0.57
(24). Rn: Net radiation=Rns-Rnl (mm/day)	3.69	3.75	3.83	3.58	3.86	3.76	3.81	4.06	3.90	3.96	3.63	3.52
(25). Eto*: Reference crop evapotranspiration												
and nigh						- 1° - 1° - 1°						
Weamer conditions (mm/day)	C	04	Ü	0 7 0	Ç	Ç	ç	0	Ç	Č	c	
្រ	3.32	0.00	3.03	0.40	3.40	ر د. د	3.00	3.07	3.02	3.00	3.36	3.04
(26) Flo	(   1			,		1	(		. (	(	1	
Eto=Eto* (No adjustment of Penman Eto*)	3.52	3.58	3.65	3.48	3.46	3.53	3.60	3.67	3.62	3.66	3.32	3.04
									1000			

# Table VII 35 (3/4) CALCULATION OF REFERENCE CROP EVAPOTRANSPIRATION (Eto) BY MODIFIED PENMAN METHOD

2. Lubukjambi Irrigation Development Project (Jan. - June)

	ue		Fah		Mar	34	Anr	16	veM	710	1	ş
	5	. l	5  - -   	- 1		Л	<u>ל</u>	1	IAIC	- 1		ŀ
DATA and CALCULATION	-	7	_	7	-	2		2	-	2	-	7
(1: Data, (1: Calculation		fig.										
de 0°30'S (F												
(2) I max (12) State (C) Table (C) T												
(8). I min (** (** (** (** (** (** (** (** (** (*												
(م	26.50	26.50	27.20	27.50	27.20	27.20	27.10	27.20	27.70	28.00	27.50	27.30
[5], Rel. Hum(max) (%)												
(6) Rel. Hum(min)									-	-		
(7). Rel. Hum(mean) (%)	87.10	86.40	77.80	77.30	77.80	77.10	76.60	76.40	83.80	84.20	86.80	85.70
[8]. ea: Mean saturation water vapour pressure (mbar)	34.70	34.70	36.10	36.80	36.10	36.10	35.90	36.10	37.20	37.80	36.80	36.30
[9]. U2: Total wind run at 2m height (km/day)	50.20	50.90	46.50	45.40	43.80	43.60	43.30	43.70	44.90	44.80	43.70	44.40
[10]. (1-W); Weighting factor	0.25	0.25	0.24	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.24	0.24
	0.76	0.76	0.76	0.77	0.76			0.76	0.77	0.77	0.77	0.76
[12]: n/N: Sunshine ratio (%)	32.40	30.00	40.20	44.80	33.80	42.30	43.30	47.40	48.20	41.70	30.70	30.10
N: Bright sunshine hours	12.10	12.10	12.10	12.10	12.10		12.10	12.10	12.10	12.10	12.10	12.10
[14]. Ra: Extra-terrestrial radiation (mm/day)	15.10	15.10	15.30	15.30	15.70	15.70	15.30	15.30	14.30	14.30	13.80	13.80
[15] f(t): Correction for temp, on longwave rad. Finl	16.00	16.00	16.10	16.20	16.10	16.10	16.10	16.10	16.20	16.30	16.20	16.20
(16) ed: Mean actual water vapour pressure (mbr)	30.22	29.98	28.09	28.45	28.09	27.83	27.50	27.58	31.17	31.83	31.94	31.11
(17) Vaper Pressure=ea-ed (mbar)	4.48	4.72	8.01	8.35	8.01	8.27	8.40	8.52	6.03	5.97	4.86	5.19
(18). ((u): Wind related function												
(u)=0.27(1+U2/100)	0.41	0.41	0.40	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
(19) n Sunshine (hours)	3.92	3.63	4.86	5.42	4.09	5.12	5.24	5.74	5.83	5.05	3.71	3.64
(20) Rns: Net shortwave radiation (mm/day) Rns=[1-al*[0.25+0.50*(n/N)]*Ra (a=0.25)	4.67	4 53	η. α	5 44	4 0.3	5 43	7. 7.6.	, r	F 07	7 00	2 4	4 4
Ş	0 13	0.13	0.14	0.14	0 14	0.14	0.15	0 15	0 12	0 11	0 11	10
(22). f(n/N). Correc. for ratio actual and max. bright												3
sunshine hours f(n/N) on I.wave rad RnI	0.39	0.37	0.46	0.50	0.40	0.48	0.49	0.53	0.53	0.48	0.38	0.37
(23). Rnl: Net longwave radiation (mm/day)												
	0.81	0.77	1.04	1.13	0.00	1.08	1.18	1.28	1.03	0.86	0.68	0.72
(24). Rn: Net radiation=Rns-Rnl (mm/day)	3.86	3.76	4.14	4.31	4.03	4.35	4.17	4.31	4.24	4.06	3.50	3.43
(25). Eto*: Reference crop evapotranspiration		Name of the last o										
and nigh											<del></del>	
weather conditions (mm/day)												
Eto* =W*Rn+(1-W)*f(u)*(ea-ed)	3.39	3.34	3.92	4.10	3.81	4.08	3.96	4.07	3.81	3.66	3.15	3.09
(26). Eto Elo=Fto* (No adjustment of Penman Eto*)	3 30	2 34	202	,	200	00 4	90	7.07	č	ů,	Ç	000
	60.0	2	3:35	2	200	00 <b>+</b>	0.30	4.0	2.01	2.00	2 .	30.5

Table VII.3.5 (4/4). CALCULATION OF REFERENCE CROP EVAPOTRANSPIRATION (Eto) BY MODIFIED PENMAN METHOD

2. Lubukjambi Irrigation Development Project (July - Dec.)

	411		ALIO	-	Sec		100		NON N	≥	Dec	
	1	,	֓֟֟֟֟֝֟֟֟֟֝֟֟֟֟֓֟֟֟֓֟֟֟֟֟֟ ֓	,	}	\ \ \	-	6		~		2
₹		7	-	7	-	1	•					
[]: Data, (): Calculation											1	
[11]. Latitude 0° 30' S (Project Site Elevation: 25m)												
(2) Tmax												
(3) Tmin					1							
(4) Tmean	27.20	27.20	27.30	27.40	27.00	27.10	27.30	27.90	27.10	27.00	26.50	26.70
(5). Rel. Hum(max) (%)								٠				
[6]. Rel.Hum(min) (%)												
(7). Rel. Hum(mean) (%)	83.90	84.30	83.20	84.40	84.90	85.80	76.80		68.30	68.40	70.00	70.60
ation w	36.10	36.10	36.30	36.50	35.70	35.90	36.30	37.60	35.90	35.70	34.70	35.10
191 U2: Total wind run at 2m height (km/day)	43.90	45.60	44.80	41.80	43.10	43.50	41.20	42.80	37.90	43.30	43.20	39.50
Ol. (1-W): Weighting factor	0.24	0.24	0.24	0.24	0.24	0.24	0.24		0.24	0.24	0.25	0.24
	92'0	0.76	0.76	0.76	0.76	0.76	0.76		0.76	0.76	0.76	0.76
112. n/N: Sunshine ratio (%)	35.20	43.00	44.70	47.20	39.30	39.00	38.20		39.40	40.40	33.00	33.60
[13] N. Bright sunshine hours (hours)	12.10	12.10	12.10	12.10	12.10	12.10	12.10	."	12.10	12.10	12.10	12.10
114. Ra: Extra-terrestrial radiation (mm/day)	14.00	14.00	14.70	14.70	15.30	15.30	15.40		15.20	15.20	14.90	14.90
[15] fth. Correction for temp. on longwave rad. Ani	16.10	16.10	16.20	16.20	16.10	16.10	16.20		16.10	16.10	16.00	16.00
[16] ed Mean actual water vapour pressure (mbr)	30.29	30.43	30.20	30.81	30.31	30.80	27.88	2	24.52	24.42	24.29	24.78
(17) Vaper Pressure=ea-ed (mbar)	5.81	5.67	6.10	5.69	5.39	5.10	8 42	9.65	11.38	11.28	10.41	10.32
: f(u): Wind related function												
f(u)=0.27(1+U2/100)	0.39	0.39	0.39	0.38	0.39	0.39	0.38		0.37	0.39	0.39	0.38
(19). n. Sunshine (hours)	4.26	5.20	5.41	5.71	4.76	4.72	4.62	4.19	4.77	4.89	3.99	4.07
(20). Rns. Net shortwave radiation (mm/day)									l	i i		į
Rris=[1-a]*[0.25+0.50*(n/N)]*Ra (a=0.25)	4.47	4.88	5.22	5.36	5.12	5.11	5.09	- N	5.10	5.15	4.64	4.67
(21): f(ed): Correc.for v. press. on l.wave rad. Rnl	0.13	0.12	0.13	0.12	0.13	0.12	0.14	0.13	0.17	0.17	0.17	0.17
(22). f(n/N): Correc for ratio actual and max.bright	GV U	070	0 50	0.52	0.45	0.45	0.44	0.41	0.45	0.46	0.40	0.40
1991 Dat Mat Consegue radiation (mm/day)												
Bull-f(n)*f(ad)*f(n/N)	0.88	0.95	1.05	1.01	0.94	0.87	1.00	0.87	1.23	1.26	1.09	1.09
(24) Rn: Net radiation=Rns-Rnl (mm/day)	3.59	3.93	4 17	4.35	4.18	4.24	4.09	4.02	3.87	3.89	3.55	3.58
(25). Eto*. Reference crop evapotranspiration							) <sub>1</sub>					
and nigt	* 											
weather conditions (mm/day)									1		ì	Ċ
	3.27	3.52	3.74	3.82	3.68	3.70	3.88	3.87	3.95	10.4	3.73	3.00
(26). Eto	2 2 7	2 50	2 74	2 82	60	3 70	3.88	3.87	3.95	4.01	3.71	3.66
EIO=EIO (INO RUJUSHIIGH OI FEITHIRI EIO)	14:5	1	5	1000	2							

### Table VII.3.6 (1/2) IRRIGATION WATER REQUIREMENTS DURING LAND PREPARATION

### 1. Present Condition of Existing Paddy Fields

T: Land Preparation Period=45 days

S : Presaturation Requirements added with 50 mm water layer=250 mm

P : Percolation =2.0 mm/day

### 1-1. Rantauberangin Imigation Development Project

Month	Period	Eto	Eo	Р	М	k	M*e**k	e**k-1	LPWR
		(mm/day)	(mm/day)	(mm/day)	(mm/day)				(mm/day)
Jan.	1-15	3.39	3.73	2.0	5.73	1.031	16.066	1.804	8.9
	16-End	3.41	3.75	2.0	5.75	1.035	16.187	1.815	8.9
Feb.	1-15	3.65	4.02	2.0	6.02	1.084	17.798	1.956	9.1
	16-End	4.08	4.49	2.0	6.49	1.168	20.869	2.216	9.4
Mar.	1-15	3.63	3.99	2.0	5.99	1.078	17.603	1.939	9.1
	16-End	3.87	4.26	2.0	6.26	1.127	19.321	2.086	9.3
Apr.	1-15	3.86	4.25	2.0	6.25	1.125	19.251	2.080	9.3
•	16-End	4.16	4.58	2.0	6.58	1.184	21.500	2.267	9.5
May	1-15	3.69	4.06	2.0	6.06	1.091	18.042	1.977	9.1
	16-End	3.77	4.15	2.0	6.15	1.107	18.605	2.025	9.2
June	1-15	3.76	4.14	2.0	6.14	1.105	18.538	2.019	9.2
	. 16-End	3.79	4.17	2.0	6.17	1.111	18.741	2.037	9.2
July	1-15	3.52	3.87	2.0	5.87	1.057	16.892	1.878	9.0
	16-End	3.58	3.94	2.0	5.94	1.069	17.300	1.912	9.0
Aug.	1-15	3.65	4.02	2.0	6.02	1.084	17.798	1.956	9.1
	16-End	3.48	3.83	2.0	5.83	1.049	16.643	1.855	9.0
Sep.	1-15	3.46	3.81	2.0	5.81	1.046	16.537	1.846	9.0
1	16-End	3.53	3.88	2.0	5.88	1.058	16.938	1.881	9.0
Oct.	1-15	3.60	3.96	2.0	5.96	1.073	17.428	1.924	9.1
	16-End	3.67	4.04	2.0	6.04	1.087	17.911	1.965	9.1
Nov.	1-15	3.62	3.98	2.0	5.98	1.076	17.539	1.933	9.1
	16-End	3.66	4.03	2.0	6.03	1.085	17.845	1.959	9.1
Dec.	1-15	3.32	3.65	2.0	5.65	1.017	15.622	1.765	8.9
	16-End	3.04	3.34	2.0	5.34	0.961	13.960	1.614	8.6

### 1-2. Lubukjambi Irrigation Development Project

Month	Period	Eto	Eo	Р	М	k.	M*e**k	e**k-1	LPWR
		(mm/day)	(mm/day)	(mm/day)	(mm/day)				(mm/day)
Jan.	1-15	3.39	3.73	2.0	5.73	1.031	16.066	1.804	8.9
	16-End	3.34	3.67	2.0	5.67	1.021	15.740	1.776	8.9
Feb.	1-15	3.92	4.31	2.0	6.31	1.136	19.651	2.114	9.3
	16-End	4.10	4.51	2.0	6.51	1.172	21.017	2.228	9.4
Mar.	1-15	3.81	4.19	2.0	6.19	. 1.114	18.858	2.047	9.2
	16-End	4.08	4.49	2.0	6.49	1.168	20.869	2.216	9.4
Apr.	1-15	3.96	4.36	2.0	6.36	1.145	19.986	2.142	9.3
100	16-End	4.07	4.48	2.0	6.48		20.795	2.209	9.4
May	1-15	3.81	4.19	2.0	6.19	1 114	18.858	2.047	9.2
2.1	16-End	3.66	4.03	2.0	6.03	1.085	17.845	1.959	9.1
June	1-15	3.15	3.47	2,0	5.47	0.985	14.648	1.678	8.7
	16-End	3.09	3.40	2.0	5.40	0.972	14.273	1.643	8.7
July -	1-15	3.27	3.60	2.0	5.60	1.008	15.345	1.740	8.8
	16-End	3.52	3.87	2.0	5.87	1.057	16.892	1.878	9.0
Aug.	1-15	3.74	4.11	2.0	6.11	1.100	18.355	2.004	9.2
	16-End	3.82	4.20	2.0	6.20	1.116	18.926	2.053	9.2
Sep.	1-15	3.68	4.05	2.0	6.05	1.089	17.976	1.971	9.1
	16-End	3.70	4.07	2.0	6.07	1.093	18.108	1.983	9.1
Oct.	1-15	3.88	4.27	2.0	6.27	1.129	19.390	2.093	9.3
	16-End	3.87	4.26	2.0	6.26	1.127	19.321	2.086	9.3
Nov	1-15	3.95	4.35	2.0	6.35	1.143	19.915	2.136	9.3
	16-End	4.01	4.41	2.0	6.41	1.154	20.325	2.171	9.4
Dec.	1-15	3.71	4.08	2.0	6.08	1.094	18.156	1.986	9.1
	16-End	3.66	4.03	2.0	6.03	1.085	17.845	1.959	9.1

### Table VII.3.6 (2/2) IRRIGATION WATER REQUIREMENTS DURING LAND PREPARATION

### 2. Future Condition of Existing Paddy Fields

T: Land Preparation Period=45 days

S : Presaturation Requirements added with 50 mm water layer=250 mm

P : Percolation =3.0 mm/day

### 2-1. Rantauberangin Imigation Development Project

Month	Period	Eto	Eo	Ρ	М	k	M*e**k	<b>e</b> **k-1	LPWR
		(mm/day)	(mm/day)	(mm/day)	(mm/day)	1 3 5 E			(mm/day)
Jan.	1-15	3.39	3.73	3.0	6.73	1.211	22.592	2.357	9.6
	16-End	3.41	3.75	3.0	6.75	1.215	22.749	2.370	9.6
Feb.	1-15	3.65	4.02	3.0	7.02	1.264	24.848	2.540	9.8
	16-End	4.08	4.49	3.0	7.49	1.348	28,834	2.850	10.1
Mar.	1-15	3.63	3.99	3.0	6.99	1.258	24.593	2.518	9.8
	16-End	3.87	4.26	3.0	7.26	1.307	26.826	2.695	10.0
Apr	1-15	3.86	4.25	3.0	7.25	1.305	26.736	2.688	9.9
	16-End	4.16	4.58	3.0	7.58	1.364	29.652	2,912	10.2
May	1-15	3.69	4.06	3.0	7.06	1.271	25.165	2.564	9.8
	16-End	3.77	4.15	3.0	7.15	1.287	25.897	2.622	9.9
June	1-15	3.76	4.14	3.0	7.14	1.285	25.809	2.615	9.9
	16-End	3.79	4.17	3.0	7.17	1.291	26.073	2.636	9.9
July	1-15	3.52	3.87	3.0	6.87	1.237	23.669	2.445	9.7
	16-End	3.58	3.94	3.0	6.94	1.249	24.199	2.487	9.7
Aug.	1-15	3.65	4.02	3.0	7.02	1.264	24.848	2.540	9.8
	16-End	3.48	3.83	3.0	6.83	1.229	23.344	2.418	9.7
Sep.	1-15	3.46	3.81	3.0	6.81	1.226	23.206	2.408	9.6
	16-End	3.53	3.88	3.0	6.88	1.238	23.727	2.449	9.7
Oct.	1-15	3.60	3.96	3.0	6.96	1.253	24.366	2.501	9.7
	16-End	3.67	4.04	3.0	7.04	1.267	24.993	2.550	9.8
Nov.	1-15	3.62	3.98	3.0	6.98	1.256	24.509	2.511	9.8
	16-End	3.66	4.03	3.0	7.03	1.265	24.908	2.543	9.8
Dec.	1-15	3.32	3.65	3.0	6.65	1 197	22.013	2.310	9.5
	16-End	3.04	3.34	3.0	6.34	1,141	19.844	2.130	9.3

### 2-2. Lubukjambi Irrigation Development Project

Period	Eto	Eo	Ρ	М	k	M*e**k	e**k-1	LPWR
	(mm/day)	(mm/day)	(mm/day)	(mm/day)	And Article	"	92 13 1	(mm/day)
	3.39	3.73	3.0	6.73	1.211	22.592	2.357	9.6
16-End	3.34	3.67	3.0	6.67	1.201	4 6 6 6		9.5
1-15	3.92	4.31	3.0					10.0
16-End	4.10	4.51	3.0					10.1
1-15	3.81	4.19						9.9
16-End	4.08	4.49			and the second		10 Table 1 Table 1 Table 1	10.1
1-15	3.96	4.36				200		10.0
16-End	4.07	4.48				1. P. C. C. C. C. C. C.		10.1
1-15	3.81	4.19						9.9
16-End	3.66	4.03	3.0			5.00		9.8
1-15	3.15	3.47						9.4
16-End	3.09	3.40					r which this ele	9.4
1-15	3.27	3.60						9.5
16-End	3.52	3.87			1 7 1 1 2	A TO STATE OF A STATE		9.7
1-15	3.74	4.11						9.8
16-End	3.82	4.20						9.9
1-15	3.68	4.05						9.8
16-End	3.70	4.07				the state of the Table	The second of the second of the second	9.8
1-15	3.88	4.27						10.0
16-End		the state of the s		The state of the s			and the second of the second	
1-15					20 70 7 100 7		*** * * * * * * * * * * * * * * * * *	10.0 10.0
16-End	4.01							
1-15	3.71							10.1
16-End	3.66	4.03	3.0	7.03	1.265	24.908	2.543	9.8 9.8
	16-End 1-15 16-End 1-15 16-End 1-15 16-End 1-15 16-End 1-15 16-End 1-15 16-End 1-15 16-End 1-15 16-End 1-15 16-End	(mm/day) 1-15 3.39 16-End 3.34 1-15 3.92 16-End 4.10 1-15 3.81 16-End 4.08 1-15 3.96 16-End 4.07 1-15 3.81 16-End 3.66 1-15 3.15 16-End 3.09 1-15 3.27 16-End 3.52 1-15 3.74 16-End 3.82 1-15 3.68 16-End 3.70 1-15 3.88 16-End 3.70 1-15 3.88 16-End 3.87 1-15 3.95 16-End 4.01 1-15 3.71	(mm/day) (mm/day) 1-15 3.39 3.73 16-End 3.34 3.67 1-15 3.92 4.31 16-End 4.10 4.51 1-15 3.81 4.19 16-End 4.08 4.49 1-15 3.96 4.36 16-End 4.07 4.48 1-15 3.81 4.19 16-End 3.66 4.03 1-15 3.15 3.47 16-End 3.09 3.40 1-15 3.27 3.60 16-End 3.52 3.87 1-15 3.74 4.11 16-End 3.82 4.20 1-15 3.68 4.05 16-End 3.70 4.07 1-15 3.88 4.27 16-End 3.70 4.07 1-15 3.88 4.27 16-End 3.87 4.26 1-15 3.88 4.27 16-End 3.87 4.26 1-15 3.95 4.35 16-End 4.01 4.41	(mm/day)         (mm/day)         (mm/day)           1-15         3.39         3.73         3.0           16-End         3.34         3.67         3.0           1-15         3.92         4.31         3.0           16-End         4.10         4.51         3.0           1-15         3.81         4.19         3.0           16-End         4.08         4.49         3.0           16-End         4.07         4.48         3.0           16-End         3.66         4.03         3.0           1-15         3.81         4.19         3.0           16-End         3.66         4.03         3.0           1-15         3.15         3.47         3.0           16-End         3.09         3.40         3.0           16-End         3.52         3.87         3.0           16-End         3.52         3.87         3.0           16-End         3.82         4.20         3.0           1-15         3.68         4.05         3.0           16-End         3.70         4.07         3.0           1-15         3.88         4.27         3.0	(mm/day)         (mm/day)         (mm/day)         (mm/day)           1-15         3.39         3.73         3.0         6.73           16-End         3.34         3.67         3.0         6.67           1-15         3.92         4.31         3.0         7.31           16-End         4.10         4.51         3.0         7.51           1-15         3.81         4.19         3.0         7.49           1-15         3.96         4.36         3.0         7.36           16-End         4.07         4.48         3.0         7.48           1-15         3.81         4.19         3.0         7.19           16-End         3.66         4.03         3.0         7.03           1-15         3.15         3.47         3.0         6.47           16-End         3.09         3.40         3.0         6.47           16-End         3.52         3.87         3.0         6.87           1-15         3.27         3.60         3.0         6.80           16-End         3.52         3.87         3.0         6.87           1-15         3.68         4.05         3.0         7.20 <td>  (mm/day) (mm/day) (mm/day) (mm/day)   1-15   3.39   3.73   3.0   6.73   1.211   16-End   3.34   3.67   3.0   6.67   1.201   1-15   3.92   4.31   3.0   7.31   1.316   16-End   4.10   4.51   3.0   7.51   1.352   1-15   3.81   4.19   3.0   7.49   1.348   1-15   3.96   4.36   3.0   7.36   1.325   16-End   4.07   4.48   3.0   7.48   1.346   1-15   3.81   4.19   3.0   7.19   1.294   16-End   4.07   4.48   3.0   7.48   1.346   1-15   3.81   4.19   3.0   7.19   1.294   16-End   3.66   4.03   3.0   7.03   1.265   1-15   3.15   3.47   3.0   6.47   1.165   16-End   3.09   3.40   3.0   6.40   1.152   1-15   3.27   3.60   3.0   6.60   1.188   16-End   3.52   3.87   3.0   6.87   1.237   1-15   3.74   4.11   3.0   7.11   1.280   1-15   3.68   4.05   3.0   7.20   1.296   1-15   3.68   4.05   3.0   7.20   1.296   1-15   3.88   4.27   3.0   7.27   1.309   16-End   3.87   4.26   3.0   7.26   1.307   1-15   3.98   4.27   3.0   7.27   1.309   18-End   3.87   4.26   3.0   7.26   1.307   1-15   3.95   4.35   3.0   7.35   1.323   16-End   4.01   4.41   3.0   7.41   1.334   1-15   3.71   4.08   3.0   7.08   1.274   1.15   3.71</td> <td>  (mm/day) (mm/day) (mm/day) (mm/day)   (mm/</td> <td>  (mm/day) (mm/day) (mm/day) (mm/day)   (mm/</td>	(mm/day) (mm/day) (mm/day) (mm/day)   1-15   3.39   3.73   3.0   6.73   1.211   16-End   3.34   3.67   3.0   6.67   1.201   1-15   3.92   4.31   3.0   7.31   1.316   16-End   4.10   4.51   3.0   7.51   1.352   1-15   3.81   4.19   3.0   7.49   1.348   1-15   3.96   4.36   3.0   7.36   1.325   16-End   4.07   4.48   3.0   7.48   1.346   1-15   3.81   4.19   3.0   7.19   1.294   16-End   4.07   4.48   3.0   7.48   1.346   1-15   3.81   4.19   3.0   7.19   1.294   16-End   3.66   4.03   3.0   7.03   1.265   1-15   3.15   3.47   3.0   6.47   1.165   16-End   3.09   3.40   3.0   6.40   1.152   1-15   3.27   3.60   3.0   6.60   1.188   16-End   3.52   3.87   3.0   6.87   1.237   1-15   3.74   4.11   3.0   7.11   1.280   1-15   3.68   4.05   3.0   7.20   1.296   1-15   3.68   4.05   3.0   7.20   1.296   1-15   3.88   4.27   3.0   7.27   1.309   16-End   3.87   4.26   3.0   7.26   1.307   1-15   3.98   4.27   3.0   7.27   1.309   18-End   3.87   4.26   3.0   7.26   1.307   1-15   3.95   4.35   3.0   7.35   1.323   16-End   4.01   4.41   3.0   7.41   1.334   1-15   3.71   4.08   3.0   7.08   1.274   1.15   3.71	(mm/day) (mm/day) (mm/day) (mm/day)   (mm/	(mm/day) (mm/day) (mm/day) (mm/day)   (mm/

Table VII.3.7 (1/3) SUMMARY OF UNIT WATER REQUIREMENT IN PRESENT CONDITION (1981-1992 FOR 12 YEARS)

1. Rantauberangin Irrigation Development Project (Base Year 1988)

											Unit: I/sec/ha	/ha
Year	Jan.	m.	Feb.	p.	Mar	- L	Apr.	_	May	ΛE	June	9
	1.0	2.	1.	2.	1.	2.	-	2.	+	2	-	2
	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
1981	0.15	00.0	00.0	68.0	1.05	0.83	0.23	0.56	0.46	0.67	0.57	0.39
2) 1982	0.15	00.00	00.00	1.29	0.56	0.00	0.23	0.23	0.46	0.36	0.23	0.39
3) 1983	0.17	0.00	00.00	1.42	0.48	0.62	0.84	0.35	1.02	1.13	0.72	0.39
1) 1984*	0.23	0.00	0.00	0.95	0.27	0.29	0.35	1.29	0.75	0.23	0.23	0.26
5) 1985	00:0	0.00	00.0	1.66	0.40	1.00	0.46	0.94	0.83	0.23	0.92	0.39
3) 1986	0.00	00.0	00.00	1.62	0.00	0.21	0.37	1.27	09.0	1.18	0.78	0.14
7) 1987	60:0	0.00	00'0	1.15	0.48	96.0	0.23	09.0	0.46	1.11	0.27	0.37
3) 1988*	0.03	0.00	0.00	1.28	0.52	0.46	0.23	1.17	0.50	0.25	0.23	0.04
1989	00.00	0.00	00.0	0.33	0.56	1.25	0.65	1.23	96.0	0.84	1.02	0.03
1990	0.22	00:00	00.0	1.20	1.22	0.81	0.29	0.77	0.46	1.05	0.82	0.04
1391	0.20	0.00	00.0	1.64	0.00	00.0	0.23	0.54	0.58	0.82	0.83	0.29
12) 1992*	0.00	0.00	0.00	1.07	0:30	1.04	0.29	1.57	0.64	0.84	0.82	0.28

												Unit: //sec/ha	/ha
Year	ă	3	Λį	Aug.		Sep	۵	Oct	ગ.	Nov.	٧.	Dec.	Ö,
		1.00	2	1	2	1	2		2	-	2.	-	2
		1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
Ξ	1981	0.00	0.00	00'0	0.00	1.33	1.42	0.63	0.23	0.67	1.02	0.23	0.43
(2)	1982	0.00	00.00	00'0	00.0	1.33	1.24	0.27	1.15	1.02	0.91	0.79	0.23
<u>-</u>	1983	00.0	00.00	0.00	00.0	0.00	1.15	0.88	0.64	0.27	0.85	0.24	0.23
€	1984*	00:00	0.00	0.00	00.0	0.65	0.81	0.82	0.27	1.05	0.85	0.43	0.23
(2)	1985	00.0	00:00	00.0	0.00	1.58	1,24	00.0	0.23	0.23	1.37	0.23	0.46
9	1986	000	00.0	00.0	00.00	1.68	0.28	00.00	0.23	0.23	0.46	0.23	0.23
<u> </u>	1987	0.00	00:00	0.00	00.00	0.78	0.54	0.03	0.23	0.23	1.21	0.23	0.48
(B)	1988*	0.00	0.00	0.00	00.00	1.60	0.42	1.18	0.81	0.23	0.93	0.23	0.23
<u>6</u>	1989	0.00	0.00	00.0	00.0	0.78	1.00	0.19	0.23	0.23	1.02	0.23	0.23
(10) 1990	980	0.00	0.00	0.00	00.0	1.54	1.07	0.65	0.23	0.23	0.46	0.23	0.39
(11) 1991	991	00.00	00.0	0.00	00.0	1.39	0.75	1.07	0.23	0.23	0.46	0.23	0.23
(12) 1	12) 1992*	00.00	00.00	0.00	00.0	0.93	0.84	0.20	0.58	0.37	0.46	0.41	0.39
		Note * . Lean Vear	San Year										

Table VII.3.7 (2/3) SUMMARY OF UNIT WATER REQUIREMENT IN PRESENT CONDITION (1981-1992 FOR 12 YEARS)

2. Lubukjambi Irrigation Development Project (Base Year 1986)

			•							•	Unit: I/sec/ha	/ha
Year	Jan.	n.	Feb.	Ъ.	Mar	#.	Apr	<u>.</u>	May		June	9
	1.	75	1.	2.	,	25	-	2.	-	25	-	2
	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
1981	00.0	00.0	0.00	0.63	0.34	0.58	0.23	0.23	0.76	0.23	0.47	0.23
?) 1982	0.00	0.00	00:00	1.41	0.41	0.00	0.23	0.23	0.46	0.23	0.24	0.34
3) 1983	0.00	0.00	0.00	1.30	0.32	0.83	1.05	1.08	0.46	0.23	0.46	0.00
	0.00	0.00	0.00	0.04	0.13	0.03	0.23	0.79	0.46	0.23	0.23	0.15
(5) 1985	0.00	0.00	0.00	1.87	0.00	0.31	0.98	0.94	0.46	0.27	0.75	0.30
(6) 1986	0.00	0.00	0.00	1.81	00.0	0.35	0.40	0.23	0.46	1.18	0.55	0.26
7) 1987	00.0	0.00	0.00	1.91	0.28	1.08	1.43	96.0	0.46	0.63	0.41	0.10
(8) 1988*	00.00	0.00	0.00	0.30	0.25	1.10	0.52	1.34	0.46	0.76	0.33	0.29
(9) 1989	0.00	0.00	0.00	1.07	0.76	0.12	0.71	1.10	0.46	0.67	0.57	0.20
0) 1990	0.00	0.00	0.00	1.05	0.32	1.02	0.23	1.34	0.46	0.99	0.86	0.27
1) 1991	0.00	0.00	0.00	0.88	0.84	0.00	0.23	1.06	1.09	0.44	0.58	0.23
12) 1992*	0.00	0.00	0.00	1.49	0.40	1.00	0.85	0.64	1.01	0.99	0.47	0.18

											Unit: I/sec/ha	/ha
Year	₹	λį	Aug.	g.	Sep.	.dc	Oct.	ĭ.	Nov		Dec	ပ
		2	<del>,</del>	2.	1.	2.	1.	S.		2	-	7
	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
(1) 1981	0.00	0.00	0.00	00.0	00.0	00.0	00.0	00.0	0.00	0.00	0.0	0.00
(2) 1982	0.00	0.00	0.00	0.00	00.0	00.0	0.00	00.0	0.00	0.00	0.00	0.00
(3) 1983	0.00	0.00	0.00	0.00	0.00	00.0	0.00	00.0	0.00	00.00	0.00	0.00
(4) 1984*	0.00	0.00	0.00	0.00	0.00	00.0	0.00	0.00	0.00	00.00	0.0	0.00
(5) 1985	00.0	0.00	00.0	0.00	00.0	00:0	0.00	0.00	0.00	0.00	0.00	0.00
(6) 1986	00.0	00.0	00.0	0.00	0.00	00.0	0.00	00.00	0.0	00.00	0.00	0.00
(7) 1987	00.0	0.00	00.0	0.00	0.00	00'0	0.00	0.00	0.0	00.0	0.0	0.00
(8) 1988*	0.00	0.00	0.00	0.00	0.00	00.0	0.00	0.00	0.00	00.0	0.00	0.00
(9) 1989	0.00	00.0	0.00	0.00	0.00	00.0	0.00	00.0	0.00	0.00	0.00	0.00
(10) 1990	00.0	00.0	0.00	00.0	00.0	00.0	0.00	0.00	0.00	00.0	0.00	0.00
(11) 1991	0.00	00.0	0.00	0.00	0.00	00.0	0.00	0.00	0.0	0.00	00.0	00.0
(12) 1992*	00.0	0.00	0.00	00.0	00.0	00.0	000	00.00	00.0	0.00	0.00	000
	Note * · Lean Year	ean Year						-				

Table VII.3.7 (3/3) SUMMARY OF UNIT WATER REQUIREMENT IN PRESENT CONDITION (1981-1992 FOR 12 YEARS)

3. Irrigation Projects in West Sumatra Region in Study Area

Feb.         Mar.         Apr.         Apr.         May         June           1.         2.         1.         2.         1.         2.         1.         2.           End         1-15         1-         2.         1.         2.         1.         2.           End         1-15         1-         2.         1.         2.         1.         2.           End         1-15         16-End         1-15         16-End         1-15         16-End         1-15         16-End           0.00         0.00         1.30         0.61         0.77         0.23         0.23         0.67         0.67           0.00         0.00         0.86         0.84         0.81         0.84         0.23         0.63         0.67         0.63           0.00         0.00         0.86         0.84         0.81         0.84         0.85         0.52         0.23         0.67         0.62           0.00         0.00         0.00         1.87         0.46         0.84         0.84         0.84         0.84         0.84         0.84         0.84         0.84         0.84         0.84         0.84         0.84         0.84												Unit : I/sec/ha	/ha
1.         2.         1.         1.         2.         1.         2.         1.         2.         1.         1.         1.         2.         1.         1.         2.         1.         2.         1.         2.         1.         2.         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.<	Jan.	ا،	┪	Fe	<u>.</u>	Ψ̈́	35.	Ϋ́		M	ay	<u>ال</u>	Je
1-15         16-End	1. 2.	7		1.	2.	1.	2.	<u>-</u> -	2.	-	25	-	2.
0.00         1.30         0.61         0.77         0.23         0.23         0.46         0.23         0.67           0.00         1.33         0.67         0.62         0.23         0.23         0.62         0.23         0.67         0.62         0.23         0.67         0.63         0.67         0.63         0.64         0.	1-15   16-End	16-En	þ	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
0.00         1.33         0.67         0.62         0.23         0.52         0.23         0.24         0.24         0.25         0.24         0.24         0.25         0.25         0.24 <th< td=""><th>0.22 0.</th><td>0.</td><td>90</td><td>0.00</td><td>1.30</td><td>0.61</td><td>0.77</td><td>0.23</td><td>0.23</td><td>0.46</td><td></td><td>0.67</td><td>0.27</td></th<>	0.22 0.	0.	90	0.00	1.30	0.61	0.77	0.23	0.23	0.46		0.67	0.27
0.00         0.86         0.84         0.81         0.84         0.23         0.24         0.87         0.84         0.87         0.84         0.89         0.85         0.67         0.97         0.47           0.00         1.30         0.72         0.23         0.23         0.63         0.63         0.63         0.63         0.63         0.63         0.63         0.63         0.63         0.79         0.72         0.71         0.71         0.71         0.71         0.71         0.71         0.71         0.71         0.71         0.71         0.71         0.71         0.72         0.71         0.72         0.72         0.72         0.72         0.72         0.72         0.72         0.72         0.	0.01 0.	0	8	00:00	1.33	0.67	0.62	0.23	0.23	0.52	0.23	0.23	0.23
0.00         1.30         0.72         0.23         0.23         0.63         0.055         0.057         0.23         0.23         0.23           0.00         1.87         0.46         0.54         0.54         1.17         0.57         0.40         0.79           0.00         1.75         0.00         0.31         0.61         0.49         0.94         0.80         0.55           0.00         0.53         0.05         0.05         0.46         0.46         0.67         0.67           0.00         0.53         0.00         0.64         0.40         0.46         1.12         0.34           0.00         0.21         1.22         0.43         0.59         1.36         0.46         0.84         0.84           0.00         0.76         1.18         0.17         0.77         1.10         0.46         1.14         0.72           0.00         1.70         0.82         0.00         0.23         0.05         0.61         0.54         0.54           0.00         0.09         0.00         0.23         0.60         0.61         0.67         0.67         0.61         0.62         0.62         0.61         0.62 <td< td=""><th>0.00</th><td>0</td><td>00</td><td>0.00</td><td>0.86</td><td>0.84</td><td>0.81</td><td>0.84</td><td>0.23</td><td>0.46</td><td>,</td><td>0.47</td><td>0.25</td></td<>	0.00	0	00	0.00	0.86	0.84	0.81	0.84	0.23	0.46	,	0.47	0.25
0.00         1.87         0.46         0.54         0.54         1.17         0.57         0.40         0.79           0.00         1.75         0.00         0.31         0.61         0.49         0.94         0.80         0.55           0.00         1.43         0.40         0.15         0.50         0.23         0.46         0.86         0.67           0.00         0.53         0.00         0.64         0.40         0.41         0.46         0.34         0.34           0.00         0.21         1.22         0.43         0.59         1.36         0.46         0.99         0.84           0.00         0.76         1.18         0.17         0.77         1.10         0.46         1.14         0.72           0.00         1.70         0.82         0.00         0.23         0.61         0.61         0.54         0.54           0.00         0.39         0.38         0.60         0.33         0.60         0.46         0.23         0.67	0.00	0	0.00	0.00	1.30	0.72	0.22	0.23	0.85	0.57	0.23	0.23	0.27
0.00         1.75         0.00         0.31         0.61         0.49         0.94         0.96         0.55           0.00         1.43         0.40         0.15         0.50         0.23         0.46         0.86         0.67           0.00         0.53         0.00         0.64         0.40         0.41         0.46         1.12         0.34           0.00         0.21         1.22         0.43         0.59         1.36         0.46         0.99         0.84           0.00         0.76         1.18         0.17         0.77         1.10         0.46         1.14         0.72           0.00         1.70         0.82         0.06         0.61         0.54         0.54           0.00         0.39         0.38         0.60         0.33         0.60         0.46         0.23         0.67	0.02 0	0	0.00	00.00	1.87	0.46	0.54	0.54	1.17	0.57	0.40	0.79	0.29
0.00         1.43         0.40         0.15         0.50         0.23         0.46         0.86         0.67           0.00         0.53         0.00         0.64         0.40         0.41         0.46         1.12         0.34           0.00         0.21         1.22         0.43         0.59         1.36         0.46         0.99         0.84           0.00         0.76         1.18         0.17         0.77         1.10         0.46         1.14         0.72           0.00         1.70         0.82         0.00         0.23         0.54         0.54         0.54           0.00         0.39         0.38         0.60         0.33         0.60         0.46         0.23         0.67	0.00	0	0.00	0.00	1.75	00.00	0.31	0.61	0.49	0.94	0.80	0.55	0.29
0.00         0.53         0.00         0.64         0.40         0.41         0.46         1.12         0.34           0.00         0.21         1.22         0.43         0.59         1.36         0.46         0.99         0.84           0.00         0.76         1.18         0.17         0.77         1.10         0.46         1.14         0.72           0.00         1.70         0.82         0.00         0.23         0.92         0.61         0.36         0.54           0.00         0.39         0.60         0.33         0.60         0.46         0.23         0.67	0.04 0.	0	0.00	0.00	1.43	0.40	0.15	0.50	0.23	0.46	0.86	0.67	0.23
0.00         0.21         1.22         0.43         0.59         1.36         0.46         0.99         0.84           0.00         0.76         1.18         0.17         0.77         1.10         0.46         1.14         0.72           0.00         1.70         0.82         0.00         0.23         0.92         0.61         0.36         0.54           0.00         0.39         0.38         0.60         0.33         0.60         0.46         0.23         0.67	0.07	0	000	0.00	0.53	00.0	0.64	0.40	0.41	0.46	1.12	0.34	0.23
0.00         0.76         1.18         0.17         0.77         1.10         0.46         1.14         0.72           0.00         1.70         0.82         0.00         0.23         0.92         0.61         0.36         0.54           0.00         0.39         0.38         0.60         0.33         0.60         0.46         0.23         0.67	0.00	0	0.00	0.00	0.21	1.22	0.43	0.59	1.36	0.46	0.99	0.84	0.10
0.00         1.70         0.82         0.00         0.23         0.92         0.61         0.36         0.54           0.00         0.99         0.38         0.60         0.33         0.60         0.46         0.23         0.67	0.15 0	0	0.00	0.00	0.76	1.18	0.17	0.77	1.10	0.46	1.14	0.72	0.19
0.00 0.99 0.38 0.60 0.33 0.60 0.46 0.23 0.67	0.00		0.0	0.00	1.70	0.82	0.00	0.23	0.92	0.61	0.36	0.54	0.25
	0.16		0.00	0.00	0.99	0.38	09.0	0.33	09.0	0.46	0.23	0.67	0.30

										Unit: I/sec/ha	/ha
July		Aug.	<u>.</u>	Sep.	p	Oct	;;	Nov	<u> </u>	Dec	ij
5		1.	2.	1:00	2	1	2	<del> </del>	25	<u>.</u> .	2.
1-15 16-End		1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
0.00 0.00	0	00.0	0.00	0.61	1.24	0.13	0.23	1.02	1.09	0.37	0.44
0.00 0.00	ol	00.0	0.00	1.47	1.18	0.44	0.92	0.36	0.63	0.23	0.23
0.00 0.00	0	0.00	00.00	0.84	1.18	0.31	0.75	0.97	1.34	0.58	0.43
0.00 0.00	0	00.0	0.00	1.45	0.74	1.34	0.77	0.23	0.46	0.77	0.23
0.00 0.00		00:00	00'0	0.51	0.57	0.71	0.56	0.23	1.45	99.0	0.43
0.00 0.00	0	0.00	0.00	1.39	92.0	0.39	0.45	1.18	0.78	0.23	0.43
0.00 0.00	0	0.00	00.0	1.47	1.05	0.19	0.29	0.23	1.30	0.37	0.31
0.00 0.00	O	00.00	0.00	0.44	0.65	1.21	1.05	1.02	0.46	0.43	0.55
0.00 0.00	0	00.0	00.0	1.18	0.35	0.54	0.37	0.23	0.46	0.23	0.31
0.00 0.00	0	00.0	00.00	1.20	0.93	0.19	0.23	0.81	0.46	0.23	0.26
0.00 0.00	0	0.00	00.00	1.45	1.14	1.36	0.48	0.47	0.46	0.23	0.23
0.00 0.00	0	00.0	00.0	1.18	0.51	0.65	1.17	0.23	0.46	0.23	0.30
Note *: Leap Year											

## Table VII.3.8 (1/2) SUMMARY OF CASE STUDY ON UNIT WATER REQUIREMENT

A. Rantauberangin Irrigation Development Project (Base Year 1988)

	Case	Starting	Starting Date of	Jan		Feb.	<b>b</b> .	Mar	ar.	Apr	Jr.	May	37	June	9
٠.		Land Pre	Land Preparation	1.	7		2	1	2.	1	2.	1	2	1.	2
1.1		1st Crop	2nd Crop	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
سا	Case 1	Feb.16	Sep. 1	0.10	00.0	0.00	1.43	69.0	0.65	0.29	1.38	0.71	0.46	0.28	0.11
_ ا	Case 2	Jan. 1	July 16	1.01	00.0	0.12	1.10	05.0	0.85	0.23	66.0	90.0	0.00	0.00	0.00
۱_	Case 3	Jan. 16	Aug. 1	00.0	00.0	0.25	1.06	0.51	99.0	0.47	1.30	96.0	0.07	00.0	0.00
ـ ا	Case 4	Feb. 1	Aug.16	00.0	00.0	0.38	1.25	0.49	0.67	0.28	1.57	0.45	0.37	0.03	0.00
۱_	Case 5	Mar. 1	Sep. 16	0.43	00.0	0.00	0.00	0.88	0.84	0.26	1.39	0.52	0.73	0.33	0.46
6	Case 6	Mar. 16	Oct. 1	0.55	0.23	0.00	00.0	00.0	1.03	0.45	1.36	0.52	0.53	09.0	0.59
1_	Case 7	Apr. 1	Oct.16	0.81	0.23	0.23	0.25	00.0	0.00	0.63	1.54	0.50	0.54	0.40	0.86
<u> </u>	Case 8	Apr.16	Nov. 1	0.62	0.46	0.23	0.74	90.0	0.00	00.0	1.73	69.0	0.52	0.41	0.66

Case 1         Starting Date of Land Preparation         1.         2.										. :					Unit: I/sec/na	/na
Land Preparation         1.         2.         1.         3.         4.         1.         2.         1.         4.		Case	Starting	Date of	U.S.	<u>^</u>	₩	6	တ္တ	ď.	Ó	ct.	NC	١٨.	Ď	JC.
Case 1         Feb. 16         Sep. 1         1-15         16-End         1-16         16-End         16-End         1-16         16-End			Land Pre	eparation	-	2	1	2.	1	2.	1	2.	1.	2.	1.	2.
Case 1         Feb.16         Sep. 1         0.00         0.00         0.00         1.73         0.58         1.36         1.02         0.31         1.14         0.23           Case 2         Jan. 1         July 16         0.00         1.54         1.28         0.00         1.36         0.40         1.57         0.95         0.23         0.21         0.00           Case 3         Jan. 16         Aug. 16         0.00         0.00         0.00         1.73         0.58         1.21         0.24         0.65         0.00           Case 4         Feb. 1         Aug. 16         0.00         0.00         0.00         0.00         0.00         0.78         1.56         1.02         0.31         1.14         0.23           Case 5         Mar. 1         Sep. 16         0.27         0.00 <t< th=""><th>,</th><th></th><th>1st Crop</th><th>2nd Crop</th><th>1-15</th><th>16-End</th><th>1-15</th><th>16-End</th><th>1-15</th><th>16-End</th><th>1-15</th><th>16-End</th><th>1-15</th><th>16-End</th><th>1-15</th><th>16-End</th></t<>	,		1st Crop	2nd Crop	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
Case 2         Jan. 1         July 16         0.00         1.54         1.28         0.00         1.36         0.40         1.57         0.95         0.23         0.21         0.00           Case 3         Jan. 16         Aug. 1         0.00         0.00         1.47         0.00         1.73         0.40         1.38         1.21         0.24         0.65         0.00           Case 4         Feb. 1         Aug. 16         0.00         0.00         0.00         1.73         0.58         1.56         1.02         0.31         1.14         0.23           Case 5         Mar. 16         Oct. 1         0.79         0.20         0.00         0.00         0.00         0.78         1.56         1.00         0.32         0.46           Case 6         Mar. 16         Oct. 1         0.79         0.20         0.00 <t< td=""><td>Ξ</td><td>Case 1</td><td>Feb. 16</td><td>Sep. 1</td><td>0.00</td><td>00:0</td><td>00.0</td><td></td><td>1.73</td><td></td><td></td><td></td><td>0.31</td><td>1.14</td><td></td><td>0.23</td></t<>	Ξ	Case 1	Feb. 16	Sep. 1	0.00	00:0	00.0		1.73				0.31	1.14		0.23
Case 3         Jan.16         Aug.1         0.00         0.00         1.47         0.00         1.33         0.40         1.36         1.21         0.24         0.65         0.00           Case 4         Feb. 1         Aug.16         0.00         0.00         0.00         1.73         0.58         1.36         1.02         0.31         1.14         0.23           Case 5         Mar.1         Sep.16         0.27         0.00         0.00         0.00         0.78         1.56         1.00         0.32         0.46           Case 6         Mar.16         Oct. 1         0.79         0.28         0.00         0.00         0.00         1.75         1.20         0.30         0.96         0.23           Case 7         Apr. 1         0.24         0.00 <td>2</td> <td>Case 2</td> <td>Jan. 1</td> <td>July 16</td> <td>00.0</td> <td>1.54</td> <td>1.28</td> <td>00'0</td> <td>1.36</td> <td></td> <td></td> <td></td> <td></td> <td>0.21</td> <td>0.00</td> <td></td>	2	Case 2	Jan. 1	July 16	00.0	1.54	1.28	00'0	1.36					0.21	0.00	
Case 4         Feb. 1         Aug.16         0.00	<u>ල</u>	Case 3	Jan. 16	Aug. 1	0.00	0.00	1.47		1.33				0.24	0.65	0.00	
Case 5         Mar. 1         Sep. 16         0.27         0.00	€	Case 4	Feb. 1		0.00	00:00	00.0		1.73		1		0.31		0.23	
Case 6         Mar.16         Oct.1         0.79         0.28         0.00         0.00         0.00         1.75         1.20         0.30         0.96         0.23           Case 7         Apr.16         Nov.1         1.34         1.16         0.75         0.00	<u>(C</u> )	Case 5	Mar. 1	Sep. 16	0.27	0.00	00'0		00.0					0.95	0.46	0.23
Case 7         Apr. 1         Oct. 16         1.08         0.80         0.25         0.00	9	Case 6	Mar.16	Oct. 1	0.79	0.28	0.00		00.0			1	0.30		0.23	0.46
Case 8 Apr.16 Nov. 1 1.34 1.10 0.75 0.00 0.00 0.00 0.00 0.00 0.00 0.0		Case 7	Apr. 1		1.08	0.80	0.25		0.00				0.50	0.94	0.23	0.23
	8	Case 8		Nov. 1	1.34	1.10							0.69	1.13	0.00	0.23

## Table VII.3.8 (2/2) SUMMARY OF CASE STUDY ON UNIT WATER REQUIREMENT

1

B. Lubukjambi Irrigation Development Project (Base Year 1986)

													Unit: i/sec/na	/na
Case	Starting	Starting Date of	Jan	_	Feb.	<b>o</b> .	Mar.	ır.	Apr.	ľ	May	λŧ	Pune	91
	Land Pr	Land Preparation		2.	7	2.	1.	2.	1	2.	1	2.	1.	N
	1st Crop	1st Crop   2nd Crop	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
(1) Case 1	Feb.16	Sep. 1	0.00	00:00	00'0	1.96	0.01	0.54	0.61	0.23	0.46	1.43	69.0	0.33
(2) Case 2	Jan. 1	July 16	0.19	0.69	0.99	1.63	0.23	0.75	0.52	0.23	0.00	0.00	0.00	0.00
(3) Case 3	Jan.16	Aug. 1	0.00	0.88	1.18	1.59		95.0	0.79	0.23	0.23	0.39	0.00	0.00
(4) Case 4	Feb. 1	Aug.16	00.0	0.00	1.37	1.78	0.01	0.57	0.60	0.46	0.23	1.02	0.23	0.00
(5) Case 5	Mar. 1	Sep.16	0.23	90.0	0.00	00.0		0.72	0.58	0.23	0.23	1.69	0.94	0.90
(6) Case 6	Mar.16	Oct. 1	0.23	0.35	0.22	0.00	0.00	0.30	0.76	0.00	0.23	1.50	1.20	1.25
(7) Case 7	Apr. 1	Oct.16	0.46	0.44	0.69	0.42	0.00	0.00	0.95	0.00	0.10	1.50	1.00	1.50

													Unit: i/sec/na	/Ja
Case	Starting	Starting Date of	July	λ	Aug	.g.	Sep	ď.	Ó	Oct.	Nov.		Dec.	ú
	Land Pr	Land Preparation	•	2.	1.	2.	-	2.	-	ci	<u>_</u>	23	ŀ	ત
	1st Crop	1st Crop 2nd Crop	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
Case 1	Feb. 16	Sep. 1	00.0	00.0	0.00		1.37		0.11		i			0.41
Case 2	Jan. 1	July 16	00.0	1.37	1.88	1.56	1.00		ı	ı	1			0.00
Case 3	Jan. 16	Aug. 1	00.00	00.0	2.06	1.75	0.98			1	-			0.00
Case 4	Feb. 1	Aug.16	00.0	00.0	0.00		1		!	ı	l			0.09
Case 5	Mar. 1	Sep.16	0.18	00.0	0.00	ŀ			F	1				0.52
Case 6	Mar. 16	Oct. 1	09'0	0.25	0.00	0.00	0.00	00.0	0.34	0.01	0.81	0.23	0.23	0.78
Case 7	Apr. 1	Oct.16	0.80	29.0	0.45		ì		1		1			0.59

Table VII.3.9 (1/2) SPECIFIC DISCHARGES AT DAMSITES

A. Rantauberangin Irrigation Development Project (Base Year 1988)

					-								
7.7	Year	Jan.	2	Feb	<b>-</b>	Mar	_	Apr		May		June	e.
		1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
Ξ	1981	0.032	0.038	0.023	0.026	0.029	0.018	0.111	0.048	0.079	0.044	0.028	0.013
2	1982	0:030	0.012	0.020	0.014	0.033	0.061	0.089	0.087	0.109	0.057	0.063	0.017
ල	1983	0.033	0.028	0.018	0.013	0:030	0.035	0.017	0.026	0.021	0.011	0.00	0.008
9	1984*	0.017	0.017	0.018	0.019	0.071	0.048	0.020		0.018	0.051	0.053	0.021
<u> </u>	1985	0.079	0.019	0.031	0.016	0.024	0.021	0.029	0.021	0.014	0.041	0.012	0.008
9	1986	0.062	0.038	0.044	0.012	920.0	0.048	0.047	0.019	0.025	0.00	0.008	0.017
E	1987	0.031	0.027	0.017	0.019	0.027	0.026	0.035	0.024	0.053	:	0.019	0.00
<u>(8</u>	1988*	0.026	0.065	0.081	0.029	0.033	0.044	0.041	0.021	0.031		0.042	0.022
<u></u>	1989	0.080	0.105	0.021	0.031	0.062	0.014	0.015	0.010	0.011	0.013	0.00	0.014
9	1990	0.021	0.024	0.066	0.038	0.015	0.015	0.024	0.029	0.041	0.015	0.010	0.019
=	1991	0.019	0.064	0.025	0.010	0.048	0.089	0.073	0.053	0.028	0.022	0.013	600.0
(12)	12) 1992*	0.049	0.067	0.053	0.038	0.064	0.022	0.035	0.018	0.014	0.016	0.00	0.008
		Moto # - Logs Voor	Noor										

Note \*: Leap Year

Year         July         Aug.         Sep.         Oct.         Nov.           1981         0.027         16-End         1-15         16-End         10-01         0.010         0.022         0.011         0.014         0.014         0.022         0.011         0.022         0.014         0.022         0.011         0.014         0.022         0.014         0.014         0.014         0.014         0.014         0.014         0.014         0.014         0.014         0.014         0.014         0.014         0.014         0.014         0.014         0.014         0.014         0.014         0.014 <th></th>																
Year         July         Aug.         Sep.         Oct.         Nov.           1981         0.027         0.030         0.011         0.016         0.010         0.010         0.019         1-15         16-End         16-End         16-End         16-End         1-15         16-End         16-End <td>/KIII</td> <td>.:</td> <td>16-End</td> <td>0.027</td> <td>0.050</td> <td>0.037</td> <td>0.031</td> <td>0.032</td> <td>0.053</td> <td>0.026</td> <td>0.056</td> <td>0.023</td> <td>0.038</td> <td>0.047</td> <td>0.018</td> <td></td>	/KIII	.:	16-End	0.027	0.050	0.037	0.031	0.032	0.053	0.026	0.056	0.023	0.038	0.047	0.018	
Year         July         Aug.         Sep.         Oct.         Nov.           1981         0.027         0.030         0.011         0.016         0.010         0.010         0.019         1-15         16-End         16-End         16-End         16-End         1-15         16-End         16-End <td>111 / SEL</td> <td>Ď</td> <td>1-15</td> <td>0.027</td> <td>0.013</td> <td>0.025</td> <td>0.024</td> <td>0.040</td> <td>0.100</td> <td>0.062</td> <td>0.066</td> <td>0.038</td> <td>0.063</td> <td>0.030</td> <td>0.026</td> <td>5</td>	111 / SEL	Ď	1-15	0.027	0.013	0.025	0.024	0.040	0.100	0.062	0.066	0.038	0.063	0.030	0.026	5
Year         July         Aug.         Sep.         Oct.           1981         0.027         0.030         0.011         0.016         0.019         0.019         0.019         0.051         0.010         0.019         0.022         0.017         0.022         0.014         0.022         0.017         0.022         0.01         0.022         0.01         0.022         0.01         0.022         0.01         0.022         0.01         0.022         0.01 <td< td=""><td></td><td></td><td>16-End</td><td>0.024</td><td>0.015</td><td>0.023</td><td>0.019</td><td>0.041</td><td>0.063</td><td>0.021</td><td>0.036</td><td>0.033</td><td>0.078</td><td>0.068</td><td>080</td><td>400.</td></td<>			16-End	0.024	0.015	0.023	0.019	0.041	0.063	0.021	0.036	0.033	0.078	0.068	080	400.
Year         July         Aug.         Sep.         Oct.           1981         1-15         16-End		Nov	1-15	0.044	0.011	0.031	0.019	0.134	0.070	0.109	0.036	0.049	0.075	060.0	0.030	
Year         July         Aug.         Sep.           1981         0.027         0.030         0.016         0.016         0.010         0.010           1982         0.016         0.014         0.022         0.031         0.014         0.023         0.017         0.001           1984*         0.009         0.070         0.009         0.009         0.002         0.054         0.017         0.01           1985         0.010         0.070         0.007			16-End	0.061	0.022	0.022	0.039	0.112	0.038	0.053	0.013	0.070	0.044	0.032	0.025	
Year         July         Aug.         Sep.           1981         1-15         16-End         1-15         16-End         1-15         16           1981         0.027         0.030         0.014         0.022         0.031         0.014           1982         0.016         0.014         0.002         0.0031         0.014           1983         0.014         0.009         0.008         0.022         0.054           1984*         0.009         0.070         0.007         0.007         0.007           1985         0.010         0.007         0.011         0.007         0.007           1986         0.011         0.008         0.016         0.016         0.016           1988*         0.025         0.012         0.012         0.018         0.016           1989         0.025         0.009         0.008         0.016         0.018           1990         0.012         0.008         0.010         0.018         0.018           1991         0.012         0.008         0.014         0.012         0.018           1992*         0.022         0.023         0.014         0.002         0.021 <t< td=""><td></td><td>Ö</td><td>1-15</td><td>0.019</td><td>0.024</td><td>0.014</td><td>0.017</td><td>0.062</td><td>0.070</td><td>0.053</td><td>0.016</td><td>0.034</td><td>0.017</td><td>0.010</td><td>0.038</td><td></td></t<>		Ö	1-15	0.019	0.024	0.014	0.017	0.062	0.070	0.053	0.016	0.034	0.017	0.010	0.038	
Year         July         Aug.           1-15         16-End         1-15         16-End         1-15           1981         0.027         0.030         0.011         0.016         0.01           1982         0.016         0.014         0.022         0.031         0.01           1983         0.014         0.009         0.008         0.022         0.05           1984*         0.009         0.070         0.053         0.014         0.02           1985         0.010         0.007         0.007         0.015         0.00           1986         0.011         0.008         0.016         0.01         0.01           1988*         0.025         0.012         0.016         0.01         0.01           1989*         0.025         0.012         0.012         0.01         0.01           1990         0.012         0.008         0.010         0.01         0.01           1991         0.012         0.008         0.014         0.01           1992*         0.022         0.023         0.011         0.009         0.009           Note * I earl Year         0.023         0.011         0.009         0.009	-	Э.	16-End	0.010	0.017	0.023	0.026	2000	0.041	0.041	0.022	0.018	0.009	0.025	0.027	- 1
Year         July         Aug.           1981         1-15         16-End         1-15         16           1982         0.016         0.014         0.022         0.018         0.008           1983         0.014         0.009         0.008         0.008         0.008           1984*         0.009         0.007         0.003         0.003         0.003           1985         0.010         0.007         0.007         0.001         0.011           1986         0.011         0.008         0.016         0.016         0.016           1989*         0.025         0.008         0.008         0.008           1989         0.025         0.009         0.001           1990         0.012         0.002         0.002           1991         0.012         0.002         0.001           1992*         0.022         0.023         0.011           Note * I earl Year         0.002         0.001		Se	1-15	0.010	0.014	0.054	0.027	0.007	0.007	0.016	0.018	0.021	0.018	0.012	0.021	
Year         July           1981         0.027         0.030         0.0           1982         0.016         0.014         0.0           1983         0.014         0.009         0.0           1984*         0.009         0.070         0.0           1985         0.010         0.070         0.0           1986         0.011         0.027         0.0           1987         0.008         0.008         0.0           1989*         0.025         0.012         0.0           1990         0.012         0.00         0.0           1991         0.012         0.00         0.0           1992*         0.022         0.023         0.0           1992*         0.022         0.023         0.0			16-End	0.016	0.031	0.022	0.014	0.015	0.008	0.011	0.059	0.010	0.030	0.014	0.00	
Year         July           1981         0.027           1982         0.016           1983         0.014           1984*         0.009           1985         0.010           1986         0.011           1987         0.008           1989*         0.025           1990         0.013           1991         0.012           1992*         0.022           Note *:   eartyle		Aŭ	1-15	0.011	0.022	0.008	0.053	0.007	0.011	0.016	0.012	0.008	0.014	0.021	0.011	
Year 1981 1982 1983 1985 1986 1986 1989 1989 1990 1991		X	16-End	0.030	0.014	0.009	0.070	0.007	0.020	0.008	0.012	0.009	0.046	0.008	0.023	n Year
Year 1981 1982 1983 1985 1986 1986 1989 1989 1990 1991		ָבָּי קל	1-15	0.027	0.016	0.014	0.009	0.010	0.011	0.008	0.025	0.020	0.013	0.012	0.022	Note *: Lez
コロ四日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日		Year		(1) 1981	(2) 1982	(3) 1983	(4) 1984*	(5) 1985	9861 (9)	(7) 1987	(8) 1988*	(9) 1989	(10) 1990	(11) 1991	(12) 1992*	

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### Table VII.3.9 (2/2) SPECIFIC DISCHARGES AT DAMSITES

	ambi irrigatior	B. Lubukjambi Irrigation Development Project (Base Year 1986)	ent Project (	Base Year							Unit: m³/sec/km²	:/km²
Year	Jan.	<b>c</b>	Feb	- C	Mar	ı.	Apr	ľ.	May	ay	June	ē
	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
(1) 1981	0.074	0.052	0.046	0.039	0.046	0.037	0.104	0.074	0.045	0.043	0.021	0.014
(2) 1982	0.066	0.022	0.030	0.017	0.035	0.090	0.196	0.104	0.074	0.054	0.056	0.013
(3) 1983	0.062	0.107	0.045	0.025	0.039	0.032	0.017	0.014	0.121	0.073	0.020	0.045
(4) 1984*	.* 0.040	0.073	0.036	0.068	0.077	0.071	0.114	0.056	0.064	0.060	0.077	0.023
(5) 1985	960.0	0.054	0.047	0.015	0.046	0.051	0.024	0.025	0.040	0.052	0.015	0.011
(6) 1986	0.089	0.049	0.031	0.013	0.065	0.058	0.029	0.111	0.114	0.020	0.016	0.014
(7) 1987	0.053	0.046	0.031	0.017	0.040	0.022	0.010	0.014	0.036	0.024	0.029	0.015
(8) 1988*	0.009	0.037	0.016	0.024	0.049	0.019	0.019	0.011	0.047	0.043	0.019	0.008
(9) 1989	0.056	0.069	0.016	0.023	0.014	0.056	0.020	0.017	0.052	0.021	0.017	0.008
(10) 1990	0.030	0.025	0.010	0.019	0.042	0.018	0.033	0.012	0.063	0.027	0.007	0.008
(11) 1991	0.080	0.084	0.033	0.032	0.023	0.071	0.091	0.029	0.018	0.017	0.017	0.00
(12) 1992*	* 0.056	090.0	0.070	0.016	0.043	0.013	0.017	0.017	0.015	0000	0.015	000

											Unit: m²/sec/km²	C/Km,
Year	J	July	Aug	9.	Sep	D.	Oct	<u>.</u>	Nov	×.	Dec.	ن
	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
(1) 1981	0.021	0.035	0.011	600.0	0.035	0.047	0,054	0.029	090.0	0.025	0.028	0.024
(2) 1982	0.016	0.012	0:030	0.014	0.013	600.0	0.036	0.032	0.075	0.028	0.045	0.086
(3) 1983	0.044	0.033	0.026	0.035	0.036	0.011	0.020	0.030	290'0	0.037	0.045	0.078
(4) 1984*	0.015	0.031	0.023	0.023	0.022	0.045	0.043	0.054	0.027	0.033	0.040	0.036
(5) 1985	0.020	0.018	0.010	0.019	0.014	0.031	0.044	0.048	0.023	0.018	0.051	0.123
(6) 1986	0.015	0.021	0.010	0.009	0.014	0.057	0.075	0.079	0.059	0.096	0.118	0.054
(7) 1987	0.009	0.010	0.014	0.014	0.015	0.011	0.020	0.026	0.044	0.027	0.022	0.012
(8) 1988*	0.008	0.008	0.023	0.011	0.009	0.013	0.013	0.007	0.010	0.007	0.040	0.022
(9) 1989	0.010	900.0	900.0	0.018	0.024	0.00	0.023	0.014	0.050	0.078	0.158	090.0
(10) 1990	0.015	0.032	0.009	0.033	0.039	0.010	0.008	0.021	0.011	0.010	0.058	0.107
(11) 1991	0.009	0.008	0.018	0.007	0.009	0.007	900.0	0.007	060.0	0.087	0.070	0.124
(12) 1992*	0.015	0.030	0.011	0.008	600.0	0.034	0.029	0.029	0.089	0.068	0.035	0.039
		3										

Note \*: Leap Year

### Table VII.3.10 OUTLINE OF TOTAL WATER REQUIREMENT IN BASE YEAR (OVERALL PLAN)

### 1. Rantauberangin Irrigation Development Project

Study Cases	Startin	g Date of	Left Bar	nk Area	Right Ba	nk Area
	Land Pr	eparation	(m <sup>3</sup> /s	sec.)	(m³/s	ec.)
	1st Crop	2nd Crop	1st Crop	2nd Crop	1st Crop	2nd Crop
Case-1	Feb.16	Sep. 1	18.16	24.15	3.75	5.73
Case-2	Jan. 1	July 16	12.48	22.18	1.69	5.62
Case-3	Jan.16	Aug. 1	16.92	21.07	3.38	5.29
Case-4	Feb. 1	Aug.16	21.17	24.15	4.63	5.73
Case-5	Mar. 1	Sep.16	18.32	21.83	3.81	5.21
Case-6	Mar.16	Oct. 1	17.83	24.82	3.64	6.09
Case-7	Apr. 1	Oct.16	20.69	19.56	4.49	Manager and the second
Case-8	Apr.16	Nov. 1	23.64	11.88	5.37	0.72

Note : Optimum Total Water Requirements

2. Lubukjambi Irrigation Development Project

		**		the state of the s	2 0 0	
Study Cases	Startin	g Date	Left Bar	nk Area	Right Ba	nk Area
	Land Pr	of eparation	(m <sup>3</sup> /s	sec.)	(m <sup>3</sup> /s	sec.)
	1st Crop	2nd Crop	1st Crop	2nd Crop	1st Crop	2nd Crop
Case-1	Feb.16	Sep. 1	29.21	18.88	24.36	16.53
Case-2	Jan. 1	July 16	23.62	28.82	20.05	
Case-3	Jan.16	Aug. 1	22.93	31.85	19.51	26.00
Case 4	Feb. 1	Aug.16	26.15	30.16	22.01	24.54
Case-5	Mar. 1	Sep.16	22.39		20.10	9.16
Case-6	Mar.16	Oct. 1	19.31	10.43		
Case-7	Apr. 1	Oct.16	21.07	12.75	18.24	

Note : Optimum Total Water Requirements

## Table VII.3.11 (1/2) CALCULATION OF DESIGN WATER REQUIREMENT IN OPTIMUM CROPPING PATTERN (OVERALL PLAN)

1. Rantauberangin Irrigation Development Project - Case-7 (Starting Date of Land Preparation 1st Crop : Apr. 1; 2nd Crop : Oct.16)

Irrigation Area	Month ( )	Jan.		Feb.	р. -	Mar	lr.	A	Apr.	×	May	2	June
	Period	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2
		1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
(A) Left Bank Area	A) Left Bank Area Unit Water Requirement (I/sec/ha)	0.81	0.23	0.23	0.25	0.00	0.00	0.63	1.54	0.50	0.54	0.40	0.86
	<ol> <li>Water Req. for 10,517 ha (m³/sec/ha)</li> </ol>	8.52	2.42	2.42	2.63	0.00	0.00	6.63	16.20	5.26	5.68	4.21	9.04
	2) Additional Supply for Existing Schemes	0.00	0.00	0.00	0.00	0.00	0.00	0.00		:	0.00	0.00	0.80
	Total Water Requirement (m³/sec)	8.52	2.42	242	263	0000	000	6.63	20.69	5.26	5.88	4.21	9.84
(B) Right Bank Area	(B) Right Bank Area Unit Water Requirement (I/sec/ha)	0.81	0.23	0.23	0.25	0.00	0.00	0.63			0.54	0.40	0.86
	1) Water Req. for 277 ha (m³/sec/ha)	0.22	90.0	90.0	0.07	0.00	0.00	0.17	1		0.15	0.11	0.24
	2) Additional Supply for Existing Schemes	0.30	0.00	0.00	0.00	0.00	0.00	0.00	4.06	١.		0.00	0.98
	Total Water Requirement (m³/sec)	<b>25</b> '0	90.0	900	0.00	000	000	0.17	4,49	0.14		0.11	122

Irrigation Area	Month.	July	×	Aug.	Sep.	9.	Oct	++	Nov	>.	<u> </u> ဒီ	Dec.
	Period	1. 2.	1.	2.	1.	2.	1.	2	7.	2		2
		1-15 16-End	1-15	16	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
(A) Left Bank Area	Unit Water Requirement (I/sec/ha)	1.08 0.80	0 0.25	0.00	0.00	0.00	0.00	1.39	0.50	0.94	0.23	0.23
	1) Water Req. for 10,517 ha (m³/sec/ha)	11.36 8.41	1 2.63	0.00	0.00	0.00	0.00	14.62	5.26		2.45	2.42
	2) Additional Supply for Existing Schemes		٠.	7	0.00	0.00	000	5.03	0.00		0.0	0.0
	Total Water Requirement (m³/sec)	12.78 10.54	4 2.63	000	000	000	0.00	19.65	5.26	9.89	2.42	2.42
(B) Right Bank Area	(B) Right Bank Area Unit Water Requirement (I/sec/ha)				0.00	0.00	0.00	1.39	0.50		0.23	0.23
	1) Water Req. for 277 ha (m³/sec/ha)	0.30 0.22			0.00	0.00	0.00	0.39	0.14		90.0	90.0
	2) Additional Supply for Existing Schemes	1.54 1.99			0.00	0.00	0.00	4.41	0.00		0.00	0.0
	Total Water Requirement (m³/sec)	1.84 2.21			000	0.00	0.00	4.80	0.14		90.0	90.0

Table VII.3.11 (2/2) CALCULATION OF DESIGN WATER REQUIREMENT IN OPTIMUM CROPPING PATTERN (OVERALL PLAN)

2. Lubukjambi Irrigation Development Project - Case-6 (Starting Date of Land Preparation 1st Crop : Mar. 16; 2nd Crop : Oct. 1)

Irrigation Area	Month	Jan.		Feb.	р.	Mar	ar.	<b>A</b>	Apr.	2	Мау	ηſ	June
	Period	1	2	-	2.	1	2.	1.	2.	1	2	-	2
		1-15 16	6-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	18-End
(A) Left Bank Area	Unit Water Requirement (I/sec/ha)	0.23	0.35	0.22	0.00	0.00	06.0	0.76	00.0	0.23	1.50	1.20	1.25
	1) Water Req. for 12,875 ha (m³/sec/ha)	2.96	4.51	2.83	0.00	0.00	11.59	9.79	00.0	2.96	19.31	15.45	16.09
	2) Additional Supply for Existing Schemes	00.0	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.75
	Total Water Requirement (m³/sec)	5.96	4.51	2.83	000	000	11.59		00'0	2.96	19.31	15.45	16.84
(B) Hight Bank Area	Unit Water Requirement (I/sec/ha)	0.23	0.35	0.22	0.00	0.00	0.90	0.76	00.00	0.23	1.50	1.20	1.25
	1) Water Req. for 10,902 ha (m3/sec/ha)	2.51	3.82	2.40	0.00	0.00	9.81		00.0		16.35	13.08	13.63
	2) Additional Supply for Existing Schemes	0.00	0.00	0.00	0.00	0.00	0.00	00.00		1.	1.27	1.02	1.34
	Total Water Requirement (m³/sec)	2.51	3.82	2.40	000	000	186	8.29	00'0	251	17.62	01.71	14.97

		귤	0.78	S	8	900	78	S	8	09.0
Dec.	2	16-End	0		.5					
	1	1-15	0.23	2.96	0.0	2.96	0.23	2.51	0.00	25
Nov.	2.	16-End	0.23	2.96	0.0	2.98	0,23	2.51	000	2.51
ž	1	1-15		-		10.43	Ħ			
Oct.	2.	16-End	0.01	0.13	000	0.13	0.01	0.11	0.00	0.11
Ō	1.	1-15				4.38				
jp.	2.	16-End	0.00	0.00	0.00	00:0	0.00	0.00	0.00	0.00
Sep	1	1-15	0.00	0.00	0.00	00'0	0.00	0.00	0.00	000
Aug.	2	16-End	0.00	.:		00:0			1	
A	1	1-15	0.00	0.00		000	. :			000
	2	16-End	0.22	2.83	0.00	2.83	0.22	2.40	0.00	2.40
July	-	1-15	0.60	7.73	0.00	27.2	0.60	6.54	0.00	8.54
Month	Period		(A) Left Bank Area Unit Water Requirement (I/sec/ha)	1) Water Req. for 12,875 ha (m3/sec/ha)	2) Additional Supply for Existing Schemes	Total Water Requirement (m³/sec)	(B) Right Bank Area Unit Water Requirement (I/sec/ha)	1) Water Req. for 10,902 ha (m³/sec/ha)	2) Additional Supply for Existing Schemes	Total Water Requirement (m³/sec)
Irrigation Area			(A) Left Bank Area				(B) Right Bank Area			

Table VII.3.12 IRRIGATION AREA AND PRIMARY CANAL LENGTH FOR PRIORITY PROJECTS

	Project Name	(A) Rantauberangin	(B) Lubukjambi
(1)	Irrigation Area	Project	Project
(1-1)	Existing Irrigation Schemes to be	_	
	incorporated :		
	(a) Left Bank Area	5,171 ha	4,142 ha
		(10 schemes)	(12 schemes)
	Existing Irrigated Area	1,837 ha	
	2) Convertible Area to Irrigation Area		
	2-1. Rainfed	553 ha	376 ha
	2-2. Undeveloped yet	2,781 ha	2,096 ha
	(b) Right Bank Area	4,338 ha	- ha
		(12 schemes)	
	Existing Irrigated Area	1,822 ha	
	Convertible Area to Irrigation		
10	2-1. Rainfed	375 ha	
	2-2. Undeveloped yet	2,141 ha	
1.5	Subtotal (1-1)	9,509 ha	4,142 ha
<u> </u>		(22 schemes)	(12 schemes)
(1-2)	Existing Drainage and Swamp Develop-		
	ment Schemes to be incorporated :		
	(a) Left Bank Area	- ha	- ha
	(b) Right Bank Area	- ha	- ha
	Subtotal (1-2)	- ha	- ha
ļ <u>.</u> .			
(1-3)	•		
	(a) Left Bank Area	4,429 ha	5,234 ha
	(b) Right Bank Area	277 ha	- ha
74 43	Subtotal (1-3)	4,706 ha	5,234 ha
(1-4)	Total Net Irrigable Area = (1-1)+(1-3)		
	(a) Left Bank Area	9,600 ha	9,376 ha
	(b) Right Bank Area	4,615 ha	- ha
(2)	Total (1-4)	14,215 ha	9,376 ha
(2)	Primary Canal Length		
(2-1)		44 km	76 km
(2-2)	Right Primary Canal	40 km	- km
	Total Length	84 km	76 km

### Table VII.3.13 OUTLINE OF TOTAL WATER REQUIREMENT IN BASE YEAR (PRIORITY PROJECT)

### 1. Rantauberangin Irrigation Development Project

Study Cases	Startin	g Date	Left Bar	nk Area	Right Ba	nk Area
	Land Pr	eparation	(m <sup>3</sup> /s	sec.)	(m <sup>3</sup> /s	ec.)
	1st Crop	2nd Crop	1st Crop	2nd Crop	1st Crop	2nd Crop
Case-1	Feb.16	Sep. 1	9.76	13.62	3.75	5.73
Case-2	Jan. 1	July 16	5.78	12.80	1.69	5.62
Case-3	Jan.16	Aug. 1	9.01	12.12	3.38	5.29
Case-4	Feb. 1	Aug.16	11.61	13.62	4.63	5.73
Case-5	Mar. 1	Sep.16	9.86	12.33	3.81	5.21
Case-6	Mar.16	Oct. 1	9.55	14.17	3.64	6.09
Case-7	Apr. 1	Oct.16	11.31	11.19	4.49	4.80
Case-8	Apr.16	Nov. 1	13.11	5.00	5.37	0.72

Note : Optimum Total Water Requirements

### 2. Lubukjambi Irrigation Development Project

Study Cases		ig Date of eparation	Left Bar		Right Ba	ank Area
	1st Crop	2nd Crop	1st Crop	2nd Crop	1st Crop	2nd Crop
Case-1	Feb.16	Sep. 1	14.23	8.41	•	
Case-2	Jan. 1	July 16	11.16		_	
Case-3	Jan.16	Aug. 1	10.78			
Case-4	Feb. 1	Aug. 16	12.55			
Case-5	Mar. 1	Sep. 16	9.48	4.40		
Case-6	Mar.16	Oct. 1	7.85			
Case-7	Apr. 1	Oct. 16	9.61	5.18		

Note : Optimum Total Water Requirements

## Table VII.3.14 (1/2) CALCULATION OF DESIGN WATER REQUIREMENT IN OPTIMUM CROPPING PATTERN (PRIORITY PROJECT)

1. Rantauberangin Irrigation Development Project - Case-7 (Starting Date of Land Preparation 1st Crop : Apr. 1; 2nd Crop : Oct.16)

Irrigation Area	A STATE OF THE STA	Jan.	_	Fe	Feb.	Mar	H	Apr	<u>-</u>	Σ	May	June	9.
	Period	1.	2.	1.	2.		2.	1.	2.	1	2.	1	2.
		1-15	6-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
(A) Left Bank Area	Unit Water Requirement (I/sec/ha)	0.81	0.23	0.23	0.25	0.00	0.00		1.54	0.50	0.54	0.40	98.0
	1) Water Req. for 4,429 ha (m³/sec/ha)	3.59	1.02	1.02	1.11	0.00	0.00	2.79	6.82	2 21	2.39	1.77	3.81
	2) Additional Supply for Existing Schemes	0.00	0.00	0.00	0.00	0.00	0.00	00.0	4.49	000	0.00	0.00	0.80
	Total Water Requirement (m³/sec)	3.59	1.02	1:02	1:41	000	000	2.79	11.31	2.21	2.39	1,77	4.61
(B) Right Bank Area	(B) Right Bank Area Unit Water Requirement (I/sec/ha)	0.81	0.23	0.23	0.25	0.00	0.00	0.63	1.54	0.50	0.54	0.40	0.86
	1) Water Req. for 277 ha (m³/sec/ha)	0.22	90.0	0.06	0.07	0.00	0.00	0.17	0.43	0.14	0.15	0.11	0.24
	2) Additional Supply for Existing Schemes	0.30	0.00	0.00	0.00	0.00	0.00	0.00	4.06	0.00	0.00	9.8 8.0	0.98
	Total Water Requirement (m³/sec)	0.52	90.0	90:0	20:0	0.00	0.00	0.17	4.49	0.14		0 11	1.22

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I III Jallon Area	MOUIL	July		Ž		Sep.	<u>۔</u>	Coct	×	ž	Nov.	ă	Dec.
	Period	1:	2	1.	2.	-	2.	1.	2.	-	2.	-	2
		1-15 16		1-15 1	6-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
(A) Left Bank Area	Unit Water Requirement (I/sec/ha)	1.08	0.80	0.25	0.00	0.00	0.00	0.00	1.39	0.50	0.94	0.23	0.23
	1) Water Req. for 4,429 ha (m³/sec/ha)	4.78	3.54	1.11	0.00	0.00	0.00	0.00	6.16	2.21	4.16	1.02	1.02
	2) Additional Supply for Existing Schemes	1.42	2.13	0.00	00.0	0.00	0.00	0.00	5.03	00.0	00.0	0.00	0.00
	Total Water Requirement (m3/sec)	8.20	2.67	111	0.00	0.00	0.00	00.0	11.19	2.21	4.16	1.02	1.02
(B) Right Bank Area	(B) Right Bank Area Unit Water Requirement (I/sec/ha)	1.08	0.80	0.25	0.00	0.00	00.00	0.00	1.39	0.50	0.94	0.23	0.23
	1) Water Req. for 277 ha (m³/sec/ha)	0.30	0.22	0.07	0.00	00.0	0.00	0.00	0.39	0.14	0.26	90.0	0.06
	2) Additional Supply for Existing Schemes	1.54	1.99	0.00	0.00	0.00	0.00	0.00	4.41	0.0	0.00	8.0	0.0
	Total Water Requirement (m³/sec)	1.84	2.21	0.07	000	0.00	000	800	4.80	0.14	0.26	900	900

## Table VII.3.14 (2/2) CALCULATION OF DESIGN WATER REQUIREMENT IN OPTIMUM CROPPING PATTERN (PRIORITY PROJECT)

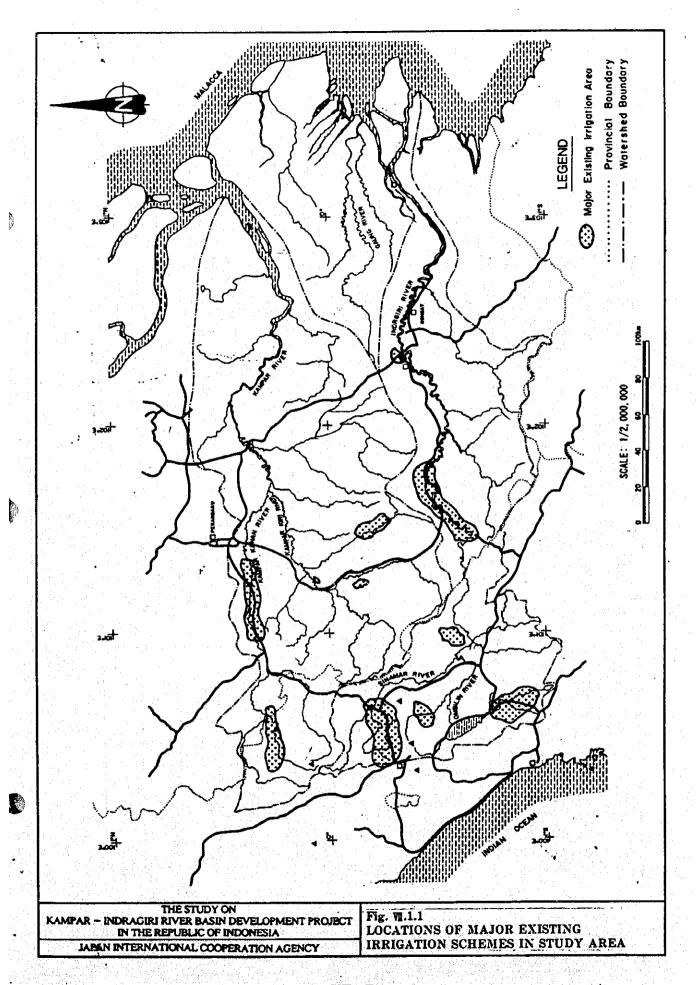
2. Lubukjambi Irrigation Development Project - Case-6 (Starting Date of Land Preparation 1st Crop : Mar.16; 2nd Crop : Oct. 1)

Irrigation Area	Month	Jan.		Feb.	b.	Mar	Jr.	Αŗ	Apr.	W	May	υľ	June
	Period	1.	2.	1.	2.	1	2.	1.	2.	1.	2.	1.	2
		1-15 10	16-End	1-15	16-End	1-15	1-15 16-End	1-15	16-End	1-15	16-End	1-15	16-End
(A) Left Bank Area	Unit Water Requirement (I/sec/ha)	0.23	0.35	0.22	0.00	0.00	0.30	0.76	0.00	0.23	1.50	1.20	1.25
	1) Water Req. for 5,234 ha (m³/sec/ha)	1.20	1.83	1.15	0.00	0.00	4.71	3.98	0.00	1.20	7.85	6.28	6.54
	2) Additional Supply for Existing Schemes	0.00	0.00	00.00	0.00	0.00	0.00	0.00	00.00	0.00	0.00	0.00	0.75
	Total Water Requirement (m³/sec)	1.20	1.83	1.15	000	00.0	14.5	3 98	000	1.20	7.85	6.28	7.29
(B) Right Bank Area	Unit Water Requirement (I/sec/ha)	•	!	•	•	-	•		•	,	,	1	-
	1) Water Req. for - ha (m³/sec/ha)	*	-			-	-	-	-	,	•	,	-
	2) Additional Supply for Existing Schemes	•	7		-		-		•	•	•	•	-
	Total Water Requirement (m³/sec)	ŧ			•	•	,	i	•	ı	,	,	
													I

Irrigation Area	Month	July	, ,	Ą	Aug.	Se	Sep.	Ŏ	Oct.	Z	Nov.	ă	Dec.
	Period	1:1	2.	1.	2.	1	2.	4.	2.	1	2.	1.	2.
		1-15	6-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
(A) Left Bank Area	Unit Water Requirement (I/sec/ha)	09:0	0.22	00.0	0.00		0.00	0.34	0.01		-	0.23	0.78
	1) Water Req. for 5,234 ha (m³/sec/ha)	3.14	1.15	0.00	00.0	0.00	0.00	1.78	0.05	4.24	1.20	1.20	4.08
	2) Additional Supply for Existing Schemes	0.00	0.00	0.00	0.00		0.00	0.00	0.00			0.00	0.00
	Total Water Requirement (m³/sec)	914	1.15	00.0	0.00	<b></b>	000	1.78	0.05			1.20	4.08
(B) Right Bank Area	(B) Right Bank Area   Unit Water Requirement (I/sec/ha)	-		•	•	•	•	-		1	•	•	•
	1) Water Req. for - ha (m³/sec/ha)	ı	-	-	-	•	•	•	•		-	-	
	2) Additional Supply for Existing Schemes	1	-	-	-	:	•	•	-	-			•
	Total Water Requirement (m³/sec)	-		-	1	•	ı	-	1	1	•	•	•

**FIGURES** 

VII IRRIGATION DEVELOPMENT PLAN



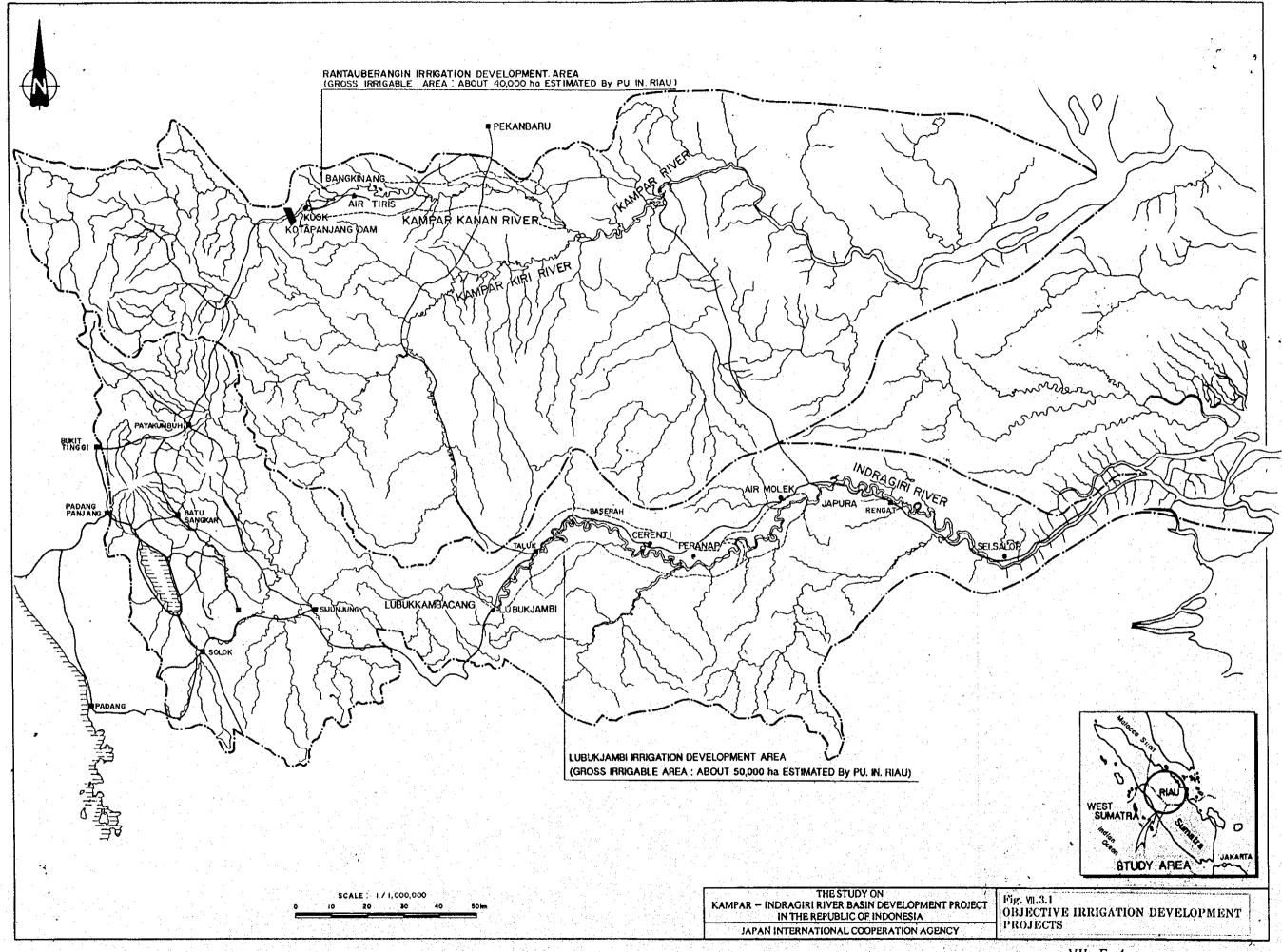
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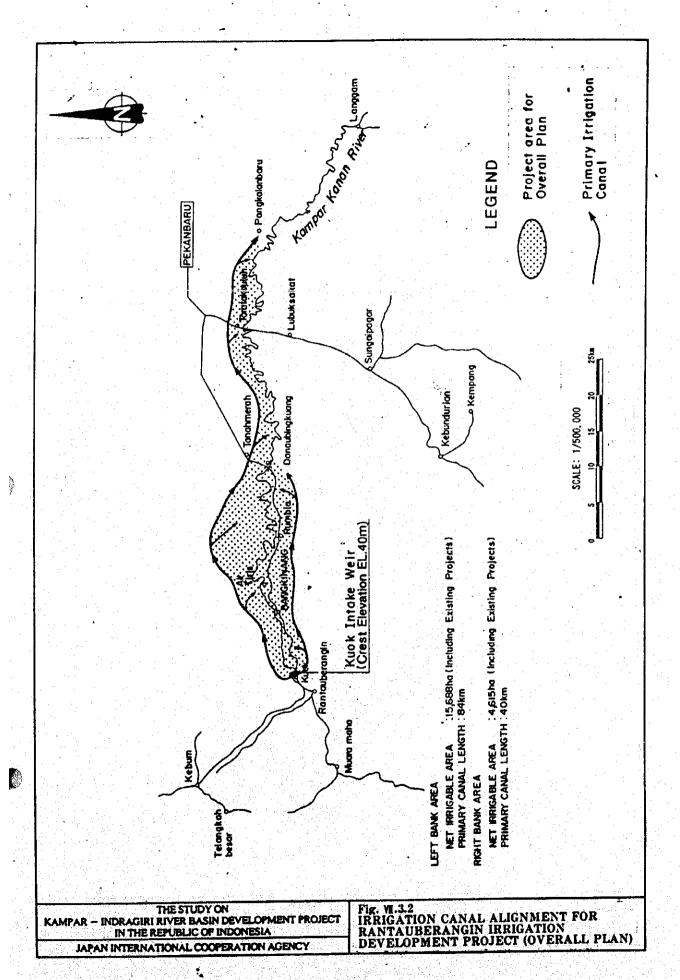
THE STUDY ON
KAMPAR-INDRAGIRI RIVER BASIN DEVELOPMENT PROJECT
IN THE REPUBLIC OF INDONESIA
JAPAN INTERNATIONAL COOPERATION AGENCY

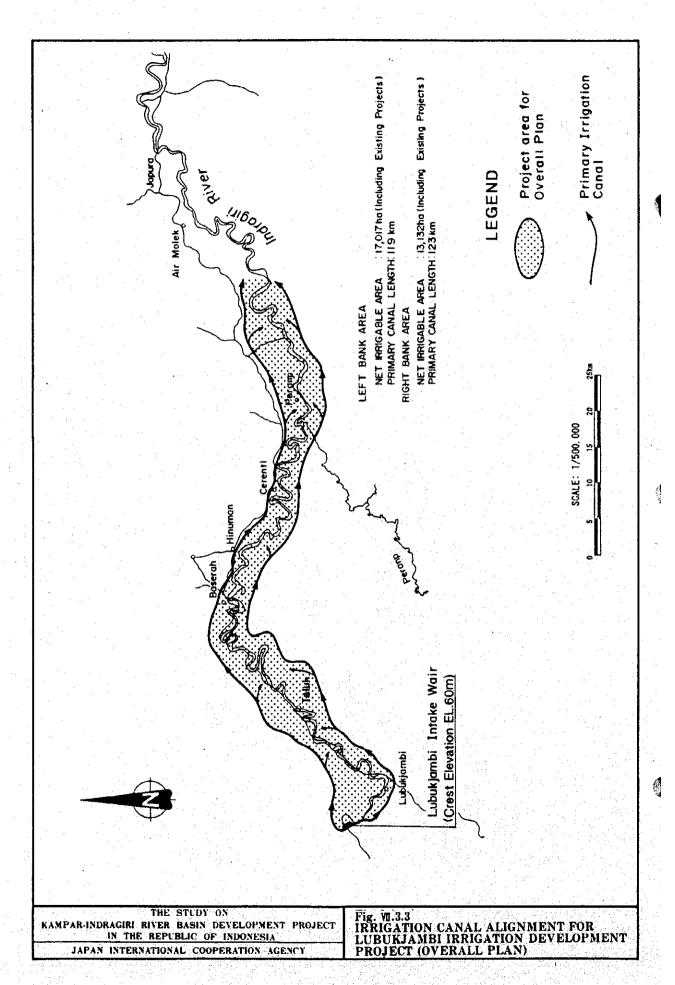
Fig. VII.1.2 CROPPING CALENDARS PREVAILING IN KAMPAR RIVER BASIN IN RIAU PROVINCE

Local V.: Local Variety. Palowija: Secondary Crop.

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Project Name	1. Lb. Ambacang II (L)	i (R)		3. Lb Ambacang I (L)		(T) 6ur	5. Seb. Gunung (R)	6. Petapahan Toar (L)		7. Sei Paing (R)			8. Seberang Taluk II (R)	ajo 1 (L)		10. Sentajo II (L)		11. Simandolak II (L)		12. Simandolak I (L)			13. Rumbio Taluk (R)			14. Rawang Udang (R)	١	
•	4	2. Kinali (R)		<u>က</u> ရ		4. Gunung (L)	S. Seb	6 Peta		7. Sei P		ari E	8. Sebe	9. Sentajo I (L)	,	70. Sen		11. Sin		12. Sim			13. Run	11		14 Ray		







Surface drainage and harvesting 20 days Water layer replacement 15 days | 15 days | 15 days Total growing period 120 days Ordinary period 85 days Water layer replacement 30 days Nursery and puddling 15 days

Remarks:

at each Rectangular shapes show actual farming period

un i t

representative farming period for the Inclined line is whole area.

staggered in 45 days, and paddy cultivation is performed in 3 groups. .... puddling οţ Commencement period

Fig. W.3.4 SCHEMATIC CROPPING PATTERN IN OBJECTIVE PROJECTS

