Table 12.1 Price Composition of Fertilizer TSP

(Rp)

	(Imported by bag)	(Imported by pouring)
1. Imported price	37,819.48	34,616.03
2. Interest of import credit	2,967.96	2,881.46
3. Assurance and other fee	659.93	573.68
4. Handling loss	189.10	103.85
5. Handling cost/bagging cost	4,870.55	8,332.-
6. Overhead	869.65	869.65
7. Handling charge of importer	575.-	575.-
Landed cost at Province		
(Distribution price by Distributor)	47,951.67	47,951.67
		Distributor
8. In-land transportation cost	3,730.-	
9. Transportation loss	239.76	
10. Handling charge	277.41	
Cost at Kabupaten		
(Distribution price by Sub-distributor)	52,198.84	
		Sub-distributor
11. Storage cost	898.44	
12. Transportation cost	1,600.-	
13. Storage loss	521.99	
14. Handling charge of Sub-distributor	252.12	
15. Handling charge of retailer	1,624.61	
Cost at UD (Village Unit)		
	57,500.-	
		KUD
16. Handling charge of KUD	2,500.-	
17. Government reserve	10,000.-	
Distribution price to farmers	70,000.-	
		FARMER

Source : KALKULASI HARGA PUPUK TSP EX.IMPOR, MINISTRY OF FINANCE. Feb.1978.

Table 12.2 Distribution of Farm Input in the Objective Area

	1974	1975	1976	1977	1978
Urea (ton)					
Kab. Sidrap	608	615	1,323	2,983	3,343
Kab. Bone	9	43	51	165	67
Kab. Soppeng	1,765	1,340	1,740	1,880	2,509
Kab. Wajo	786	313	190	434	461
Objective area total	3,168	2,311	3,304	5,462	6,380
TSP (ton)					
Kab. Sidrap	383	171	571	1,005	1,198
Kab. Bone	7	68	45	106	32
Kab. Soppeng	56	40	29	57	64
Kab. Wajo	210	109	18	101	67
Objective area total	656	388	663	1,269	1,361
Pesticide/Insecticide (kg)					
Kab. Sidrap	5,507	1,835	23,698	21,301	18,715
Kab. Bone	163	384	351	1,295	59
Kab. Soppeng	1,531	852	517	3,121	3,911
Kab. Wajo	12,663	6,230	3,867	2,320	4,829
Objective area total	19,864	9,301	28,433	28,037	27,514
Rodenticide (kg)					
Kab. Sidrap	422	127	267	2,327	836
Kab. Bone	8	28	220	72	5
Kab. Soppeng	864	267	222	898	525
Kab. Wajo	628	615	538	116	164
Objective area total	1,922	1,037	1,247	3,413	1,530

Source : Agricultural Extension Service of Sidrap, Bone, Soppeng and Wajo Kabupatens.

Table 12.3 Number of Warehouse for cereals

Capacity	less than 1,000 tons	3,500 tons	Total
In the South Sulawesi			
Number of warehouse	32	19	51
Total capacity (ton)	31,650	66,500	98,150
in the objective area			
Number of warehouses	7 (22%)	8 (42%)	15 (29%)
Total capacity	6,000 (20%)	28,000 (42%)	34,000 (35%)

Source : DOLOG, Ujung Pandang

Table 12.4 Balance of Supply and Demand of Paddy in the Objective Area

	Production	Seed & Wasted (t)	Supply Amount (t)	Population (t)	Consumption (D.S.Paddy) (t)	Balance (t)
Kab. Sidrap						
Panca Lautang	16,000	1,200	14,800	18,940	4,740	10,060
TelluLimpoE	8,600	650	7,950	16,190	4,050	3,900
MaritengaE	64,200	4,820	59,380	36,230	9,060	50,320
DuaPituE	60,700	4,550	56,150	50,540	12,630	43,520
Sub-total			136,280		30,480	107,800
Kab. Bone						
Cenrana	6,400	480	5,920	24,320	6,080	- 160
Ajangale	6,200	470	5,730	47,850	11,960	- 6,230
DuaBoccoe	3,900	290	3,610	40,430	10,110	- 6,500
Tell Siatenge	6,600	500	6,100	45,200	11,300	- 5,200
Ponre	3,700	280	3,420	12,690	3,170	- 250
Ulawang	1,400	110	1,290	44,620	11,160	- 9,870
Lamur	6,600	500	6,100	37,010	9,250	- 3,150
Lappariaja	16,600	1,250	15,350	46,480	11,620	3,730
Libureng	7,100	530	6,570	20,640	5,160	1,410
Kahu	5,300	400	4,900	27,080	6,770	- 1,870
Bonto Cani	3,700	280	3,420	12,570	3,140	280
Sub-total			62,410		89,720	- 27,310
Kab. Soppeng						
Lalabata	43,100	3,230	39,870	64,080	16,020	23,850
Liliriaja	48,600	3,650	44,950	49,670	12,420	32,530
Marioriawa	12,300	920	11,380	45,140	11,290	90
Marioriawo	10,000	750	9,250	30,380	7,600	1,650
Lili-Rilau	6,700	500	6,200	51,740	12,930	- 6,730
Sub-total			111,650		60,260	51,390
Kab. Wajo						
Tempe	400	30	370	45,550	11,390	- 11,020
Tana Sitolo	4,100	310	3,790	35,210	8,800	- 5,010
Maniang Pajo	8,500	640	7,860	20,870	5,220	2,640
Belawa	11,600	870	10,730	36,840	9,210	1,520
Sabang Paru	4,100	310	3,790	41,260	10,320	- 6,530
Pamana	6,700	500	6,200	38,380	9,600	- 3,400
Takkalalla	28,900	2,170	26,730	44,630	11,160	15,570
Majauleng	17,800	1,340	16,460	33,510	8,380	8,080
Sajoanging	26,000	1,950	24,050	37,590	9,400	14,650
Sub-total			99,980		83,480	16,500
Grand Total			412,320		263,940	148,380

Note: 1. All the amount is calculated by the form of dry stalked paddy.
2. Seeds and wasted is estimated 7.5% of total production.
3. Per capital consumption of rice is estimated 130 kg/year.

Table 12.5 Forecast Future Supply and Demand of Rice in the Command Area of DOLOG of South Sulawesi

(Unit - 1,000)

		1980	1985	1990	1995	2000	Growth Ratio of Production
South Sulawesi	P.	6,497	7,173	7,919	8,744	9,654	
	C.	1,624	1,793	1,980	2,186	2,413	1.88
	S.	1,958	2,354	2,750	3,146	3,542	
	B.	334	561	770	960	1,129	
North Sulawesi	P.	2,151	2,375	2,622	2,895	3,196	
	C.	538	594	655	724	799	2.06
	S.	306	385	463	541	620	
	B.	- 232	- 209	- 192	- 183	- 179	
Central Sulawesi	P.	1,144	1,263	1,395	1,540	1,700	
	C.	286	316	349	385	425	1.84
	S.	269	326	383	439	496	
	B.	- 17	10	34	54	71	
South-East Sulawesi	P.	894	987	1,089	1,203	1,328	
	C.	223	247	272	301	332	1.00
	S.	45	45	45	45	45	
	B.	- 178	- 202	- 227	- 256	- 287	
East Kalimantan	P.	918	1,013	1,119	1,235	1,364	
	C.	229	253	280	309	341	1.69
	S.	144	169	193	218	243	
	B.	- 85	- 84	- 87	- 91	- 98	
Maluku	P.	1,356	1,497	1,653	1,825	2,015	
	C.	339	374	413	456	504	2.25
	S.	24	31	39	46	54	
	B.	- 315	- 343	- 374	- 410	- 450	
Irian	P.	1,150	1,270	1,402	1,548	1,709	
	C.	287	317	350	387	427	2.00
	S.	1	2	2	2	2	
	B.	- 286	- 315	- 348	- 385	- 425	
Total	P.	14,110	15,578	17,199	18,990	20,966	
	C.	3,526	3,894	4,299	4,748	5.241	1.83
	S.	2,747	3,312	3,875	4,437	5,002	
	B.	- 779	- 582	- 424	- 311	- 239	

Note: P = Population, annual increase rate 2%
C = Consumption of dry stalked paddy (130 kg x 1,923) x population
S = Supply (forecasted paddy production - 7.5% of seed and wasted)
B = Balance (- is shortage)
Growth Ratio of Production = Production in 2000 ÷ Production in 1980

Table 12.6 Production Forecast by Least Square Method

(tons)

	C	r		1980	1985	1990	1995	2000
South Sulawesi	342,529	0.65	y = 85,632.2x - 4,733,866	2,116,714	2,544,875	2,973,037	3,401,200	3,829,359
North Sulawesi	67,688	0.84	y = 16,922x - 1,022,392	331,373	415,984	500,594	585,205	669,815
Central Sulawesi	48,870	0.88	y = 12,217.7x - 686,074	291,340	352,428	413,517	474,605	535,693
South-East Sulawesi	- 22,877	0.81	y =-5,719 + 487,487					
East Kalimantan	21,359	0.71	y = 5,339.8 + 271,141	156,045	182,743	209,442	236,142	262,841
Maluku	6,530	0.73	y = 1,633x - 105,028	25,577	33,740	41,903	50,066	58,229
Irian	55	0.45	y = 13.6x + 349	1,441	1,509	1,577	1,645	1,714

Table 13.1 Present Farm Income of Average Size Farm of each Kecamatan in the Objective Area

	Gross Farm Income			Farming Cost			Net Farm Income
	Paddy	Polowijo	Total	Paddy	Polowijo	Total	
Kab. Sidrap							
PancaLautang	333,320	9,740	343,060	94,340	3,410	97,750	245,310
TelluLimpoE	203,050	5,960	209,010	63,280	1,570	64,850	144,160
MariTengaE	634,040	9,160	643,200	186,150	1,570	187,720	455,480
DuaPituE	438,500	4,820	443,320	126,440	1,730	128,170	315,150
Kab. Bone							
Cenrana	120,530	2,090	122,620	59,140	1,260	60,400	62,220
Ajangale	57,740	26,570	84,310	30,490	12,640	43,130	41,180
DuaBoccoE	44,050	10,130	54,180	19,770	4,020	23,790	30,390
TellSiatenge	68,790	8,210	77,000	37,270	3,850	41,120	35,880
Ponre	109,710	59,920	169,630	45,050	27,370	72,420	97,210
Ulawang	12,620	70,800	83,420	6,090	50,580	56,670	26,750
Lamur	86,170	134,020	220,190	29,960	79,590	109,550	110,640
Lappariaja	187,950	128,690	316,640	67,230	73,060	140,290	176,350
Libureng	158,990	172,820	331,810	67,960	74,890	142,850	188,960
Kahu	90,800	223,210	314,010	42,780	87,760	130,540	183,470
BontoCani	140,800	57,120	197,920	63,250	37,390	100,640	97,280
Kab. Soppeng							
Lalabata	293,920	6,890	300,810	90,930	1,910	92,840	207,970
Liliriaja	413,670	22,370	436,040	121,410	10,810	132,220	303,820
Marioriawa	299,460	12,340	311,800	48,240	3,410	51,650	260,150
Marioriawo	99,550	152,730	252,280	29,320	48,100	77,420	174,860
Lili-Rilau	53,820	35,330	89,150	20,670	20,710	41,380	47,770
Kab. Wajo							
Tempe	4,790	7,380	12,170	1,810	1,670	3,480	8,690
TanaSitolo	56,670	43,720	100,390	21,310	8,600	29,910	70,480
Maniang Pajo	206,580	134,290	340,870	72,810	32,520	105,330	235,540
Belawa	154,350	31,850	186,200	52,200	7,300	59,500	126,700
Sabang Paru	51,150	65,980	117,130	19,290	17,170	36,460	80,670
Pamana	91,760	76,760	168,520	31,350	21,460	52,810	115,710
Takkalalla	300,990	25,890	326,880	104,920	6,630	111,550	215,330
Majauleng	208,990	35,770	244,760	67,940	9,000	76,940	167,820
Sajoanging	352,350	60,550	412,900	141,940	9,230	151,170	261,730
Grand Total			6,910,220			2,422,550	4,487,670
Average			238,283			83,536	154,747

Table 13.2 Present Condition of Farm Budget of Typical Size Farm in the Objective Area

	Paddy Field	1.13 ha	
	Upland Field	0.61 ha	
	Total	1.74 ha	
	Family Size	5.73	
1.	Gross Farm Income		Rp.238,280
	Wet Season Paddy	Rp.126,550	
	Dry Season Paddy	Rp. 51,310	
	Upland Paddy	Rp. 4,040	
	Polowijo	Rp. 56,380	
2.	Farming Expense		Rp. 83,540
	Farm input	Rp. 7,840	
	Hired labour and cows	Rp. 75,250	
	Miscellaneous cost	Rp. 450	
3.	Non Farm Income		Rp. 35,000
4.	Other Miscellaneous Income		Rp. 35,900
5.	Tax and Fees		Rp. 260
6.	Living Expenses		Rp.225,020
7.	Reserve		Rp. 360 (US$ 0.58)

Table 13.3 Annual Living Expenses of Typical Farm Household in the Objective Area in 1978/79

Item	Per capita	%	Average family size farm in the area (5.73)
Food	24,380	62.09	139,700
Clothing	2,670	6.80	15,300
Residence	3,580	9.12	20,510
Luxury	5,200	13.24	29,800
Education	920	2.34	5,270
Social expense	1,670	4.25	9,570
Miscellaneous	850	2.16	4,870
Total	39,270	100.00	225,020

Table 14.1 Land Use in the Future

Name of Kecamatan	Land Use in The Future: Total paddy field (ha) (1)	Technical irrigation area (ha) (2)	Rainfed area (ha) (3)	Rate of irrigation facilities (4)=(2)/(1)	Upland area (ha) 55)	Land Use at Present: Total paddy field (ha) (6)	Technical irrigation area (ha) (7)	Rainfed area (ha) (8)	Rate of irrigation facilities (9)=(7)/(6)	Upland area (ha) (10)
Panoa Lauting	5,080	2,320	2,760	0.45	1,240	5,080	2,320	2,760	0.45	1,240
Tellulimpoe	2,670	1,250	1,420	0.48	140	2,670	1,250	1,420	0.48	140
Maritengae	11,930	10,390	1,540	0.87	220	11,930	10,390	1,540	0.87	220
Dua Pitue	12,520	11,830	690	0.95	3,220	12,420	6,550	5,870	0.52	3,320
Cenranae	5,080	0	5,000	0	940	5,080	0	5,080	0	940
Ajangale*	5,750	5,400	350	0.93	60	4,750	0	4,750	0	1,060
Dua Boecos*	3,960	3,900	60	0.98	120	3,060	1,700	1,360	0.55	1,020
Tellusiatingge	4,990	640	4,350	0.12	590	4,990	640	4,350	0.12	590
Ponre	1,890	0	1,890	0	700	1,890	0	1,890	0	700
Ulaweng	920	0	920	0	4,010	920	0	920	0	4,000
Lamuru	1,530	0	1,530	0	4,740	1,530	0	1,530	0	4,740
Lappariaja	5,400	740	4,660	0.13	4,270	5,400	740	4,660	0.13	4,270
Libureng	6,760	3,700	3,060	0.45	140	5,300	0	5,300	0	1,600
Kahu*	7,750	6,300	1,450	0.82	280	7,310	430	6,880	0.05	720
Bonto Cani	1,660	0	1,600	0	840	1,600	0	1,600	0	840
Lalabata*	6,850	6,650	200	0.83	4,980	6,780	2,800	3,980	0.41	5,050
Liliriaja*	7,160	7,160	0	1.00	4,530	6,480	2,560	3,920	0.40	5,210
Marioriawa*	4,200	4,200	0	1.00	2,830	3,630	3,400	230	0.95	3,400
Marioriwawe*	1,770	1,070	700	0.55	6,070	1,740	210	1,530	0.12	6,100
Lilirilau*	4,170	3,860	310	0.93	9,820	2,920	810	2,110	0.28	11,070
Tempe*	480	90	190	0.30	2,070	280	0	280	0	2,070
Tanasitolo*	4,020	1,800	2,220	0.45	2,360	4,020	0	4,020	0	2,360
Maniangpajo*	7,050	4,400	2,650	0.62	2,850	7,000	520	6,480	0.07	2,900
Belawa*	4,660	3,680	980	0.78	5,910	4,610	1,630	2,980	0.35	5,960
Sabbangparu*	3,210	2,800	410	0.88	5,410	2,510	0	2,510	0	6,110
Pammana*	6,500	6,500	0	1.00	2,390	3,480	240	3,240	0.06	5,410
Takkalalla*	12,920	90	12,830	0.01	2,470	12,920	0	12,920	0	2,470
Majauleng*	10,350	4,110	6,240	0.40	2,570	10,350	220	10,130	0.19	2,510
Sajoanging*	15,790	7,020	8,770	0.44	2,630	15,790	0	15,790	0	2,630
Total or Average	166,760	99,900	66,860	0.59	78,400	156,440	36,410	120,030	0.23	88,720

Remarks : Mark * indicates the Kecamatan benefited from irrigation projects.

Table 14.2 Design Criteria of Proposed Farming for Paddy

1.	Varieties	IR-series
2.	Growing period	130 days
3.	Amount of seed	25 kg/ha
4.	Nursery period	20 days
5.	Area of nursery bed	1/20 of paddy field
6.	Land preparation	2 times of ploughing and hallowing
7.	Planting method	Transplanting
8.	Planting density	30 cm x 15 cm, 3 stems/hill
9.	Planting depth	3 cm from the surface
10.	Fertilization	
	Volume - nursery bed	5 kg of Urea 5 kg of TSP
	- paddy field	245 kg of Urea 95 kg of TSP
	Time in paddy field	
	All TSP	Basic dressing
	25% Urea	Basic dressing at transplanting time
	25% Urea	First top dressing at 2 weeks after transplanting time
	50% Urea	2nd top dressing in the late period of a young panicle formation stage.
11.	Weeding	at 25th and 50th day after transplanting.
12.	Application of chemicals	4 l/ha and 200 g of zinc hosphide/ha.
13.	Water Control	
	. Transplanting to rooting period	Deep water depth
	. Most tillering period	Shallow water depth with intermitted irrigation
	. Neck-node differentiation period upto panicle formation period	Drying method
	. Full ripening period to harvested	Water drained
14.	Harvesting	By sickle

Table 14.3 Maximum Unit Yield of Paddy at Kecamatan Level

(unit: dry stalk paddy ton/ha)

	Kecamatan	Entire Area		BIMAS Area		INMAS Area	
		W	D	W	D	W	D
Kab. Sidrap	Panca Lantang	5.49	5.00	8.13	6.72	7.44	4.80
	Tellulinepoe	4.35	5.00	7.19	6.56	4.97	4.84
	Maritengae	4.10	5.94	6.26	7.32	5.24	6.51
	Dua Pitue	4.15	5.28	7.61	7.62	5.94	6.64
Kab.Soppeng	Lalabata	4.76	4.39	5.29	6.42	4.50	5.20
	Liliriaja	5.70	5.69	6.10	6.31	5.38	5.89
	Marioriawa	4.45	5.22	5.53	7.35	4.56	5.81
	Marioriwawo	6.39	5.16	5.87	9.81	4.13	4.63
	Lilirilau	4.09	5.30	5.36	6.41	5.08	4.00
Kab. Wajo	Tempe	3.69	2.50	*	*	*	*
	Tanasitolo	3.55	2.35	3.97	*	*	*
	Maniang Pajo	4.08	3.83	5.62	*	4.33	*
	Belawa	4.06	2.24	5.43	*	4.25	*
	Sabbang Paru	3.47	2.04	4.03	*	*	*
	Pamana	3.88	1.80	5.10	*	4.17	*
	Takkalalla	4.25	3.53	4.64	*	*	*
	Majauleng	3.71	2.80	4.14	*	*	*
	Sajoanging	3.34	*	4.30	*	3.89	*
Kab. Bone	Cenrana	2.00	1.81	*	*	*	*
	Ajangale	2.08	1.87	*	*	*	*
	Dua Boccoe	2.27	2.46	3.86	4.0	3.48	3.21
	Tellu Siattinge	2.24	2.17	4.53	4.04	3.69	3.69
	Ponre	2.19	2.43	*	*	*	*
	Ulaweng	1.73	2.12	*	*	1.55	*
	Lamuru	2.85	2.82	4.83	4.58	3.78	3.95
	Lapariaja	2.70	4.58	5.47	5.32	3.83	4.90
	Libureng	2.21	2.33	4.27	4.45	*	*
	Kahu	2.36	2.46	5.86	*	3.42	*
	Bonto Cani	1.94	2.31	4.27	3.42	*	*

W : Wet season paddy

D : Dry season paddy

* : No data (no planting)

Table 14.4 The Results of Unit Yield of Wet Season Paddy (1978) in Provincial Seed Center

(unit : Drystalk paddy)

Name of Varieties	Unit Yield
	(t/ha)
PB - 32	8.97
PB - 36	6.01
PB - 38	6.54
Citarum	6.54
Asahan	6.26

Remarks :

1) Conversion ratio from drystalk paddy to paddy : 765/1,000

2) Farm inputs to be practiced

Urea	:	200 Kg/ha
Ammonium Sulphate	:	75 kg/ha
TSP	:	100 kg/ha
Seed	:	25 kg/ha
Diazinon	:	3 l/ha
Furadan	:	40 kg/ha

Table 14.5 Unit Yields of Crops With Project and Without Project

(Unit: Dry stalk paddy)

		With Project Irrigated land		Without Project Irrigated land		Without Project Rainfed	
		WP/1	DP/2	WP	DP	WP	DP
1.	Dua Pitue	6	6	6	6	3.10	3.89
2.	Ajangale	6	6	-	-	1.60	1.87
3.	Dua Boccoe	6	6	3.41	2.97	1.90	2.05
4.	Libureng	6	6	-	-	2.03	1.84
5.	Kahu	6	6	5.06	2.35	1.58	2.35
6.	Lalabata	6	6	5.65	5.35	2.98	2.98
7.	Liliriaja	6	6	6.00	6.00	2.70	3.84
8.	Marioriawa	6	6	3.61	6.00	3.00	3.28
9.	Marioriwawo	6	6	5.45	4.90	2.37	3.90
10.	Lilirilau	6	6	5.17	5.51	2.22	3.75
11.	Tempe	6	6	-	-	2.72	-
12.	Tanasitolo	6	6	-	-	2.51	1.82
13.	Maniang Pajo	6	6	3.74	-	2.84	2.48
14.	Belawa	6	6	3.96	-	3.39	1.58
15.	Sabbang Paru	6	6	-	-	2.39	1.75
16.	Pammana	6	6	3.71	-	2.78	-
17.	Takkalalla	6	6	-	-	2.92	2.78
18.	Majauleng	6	6	3.76	-	3.07	2.50
19.	Sajoanging	6	6	-	-	2.40	-

/1 : WP : Wet season paddy (ton/ha)

/2 : DP : Dry season paddy (ton/ha)

Table 14.6(1) Future Crop Production at Irrigation Project levels

(Summary)

(unit : tons)

	With Project(A)	Without Project(B)	Increment (A) - (B)
Paddy			
Irrigated land			
wet season	486,000	93,400	392,600
dry season	438,000	84,200	353,800
Rainfed area			
wet season	0	137,800	- 137,800
dry season	0	17,000	-17,000
Upland rice	0	790	-790
Sub-total	924,000	333,190	590,810
Maize	0	10,100	- 10,100
Peanuts	0	3,810	-3,810
Soybeans	0	570	-570
Green beans	0	1,050	-1,050
Cassava	0	2,630	-2,630

Table 14.6(2) Future Crop Production at Irrigation Project Level

(unit : tons)

	Langkemme Irrigation Project			Bila Irrigation Project			Sanrego Irrigation Project		
	With Project(A)	Without Project(B)	Increment (A) - (B)	With Project(A)	Without Project(B)	Increment (A) - (B)	With Project(A)	Without Project(B)	Increment (A) - (B)
Paddy									
Irrigated land									
wet season	30,200	1,200	28,800	63,000	1,900	61,100	60,000	2,200	57,800
dry season	22,200	1,100	21,100	39,600	0	39,600	51,600	1,000	50,600
Rainfed area									
wet season	0	13,100	- 13,100	0	29,100	- 29,100	0	13,100	- 13,100
dry season	0	9,600	- 9,600	0	0	0	0	0	0
Upland rice	0	0	0	0	140	140	0	290	-290
Sub-total	52,200	25,000	27,200	102,600	31,140	71,460	111,600	16,590	95,010
Maize	0	210	-210	0	1,210	-1,210	0	2,750	-2,750
Peanuts	0	30	- 30	0	450	-450	0	2,230	-2,280
Soybeans	0	20	- 20	0	20	-20	0	0	0
Green beans	0	40	- 40	0	250	-250	0	100	-100
Cassava	0	0	- 0	0	110	-110	0	650	-650

Table 14.6(3) Future Crop Production at Irrigation Project Level

(unit : tons)

	Lawo Irrigation Project			Boya Irrigation Project			Gilirang Irrigation Project		
	With Project(A)	Without Project(B)	Increment (A) - (B)	With Project(A)	Without Project(B)	Increment (A) - (B)	With Project(A)	Without Project(B)	Increment (A) - (B)
Paddy									
Irrigated land									
wet season	18,000	2,800	15,200	60,000	45,800	14,200	60,000	0	60,000
dry season	10,800	2,700	8,100	58,500	41,900	16,900	60,000	0	60,000
Rainfed area									
wet season	0	7,100	- 7,100	0	5,800	- 5,800	0	22,400	- 22,400
dry season	0	4,600	- 4,600	0	0	0	0	0	0
Upland rice	0	0	0	0	0	0	0	0	0
Sub-total	28,800	17,200	11,600	118,800	93,500	25,300	120,000	22,400	97,600
Maize	0	90	-90	0	70	-70	0	190	-190
Peanuts	0	0	0	0	50	-50	0	160	-160
Soybeans	0	20	-20	0	0	0	0	0	0
Green beans	0	0	0	0	10	-10	0	250	-250
Cassava	0	0	0	0	0	0	0	0	0

Table 14.6(4) Future Crop Production at Irrigation Project Level

(unit : tons)

	Waianae Irrigation Project			Padangeng Irrigation Project			Cenranae Irrigation Project		
	With Project(A)	Without Project(B)	Increment (A) - (B)	With Project(A)	Without Project(B)	Increment (A) - (B)	With Project(A)	Without Project(B)	Increment (A) - (B)
Paddy									
Irrigated land									
wet season	156,000	26,300	129,700	25,200	13,200	12,000	13,800	0	13,800
dry season	156,000	24,900	131,100	25,200	12,600	12,600	13,800	0	13,800
Rainfed area									
wet season	0	35,200	- 35,200	0	5,200	- 5,200	0	6,800	- 6,800
dry season	0	1,400	-1,400	0	1,400	- 1,400	0	0	0
Upland rice	0	330	-330	0	30	-30	0	0	0
Sub-total	312,000	88,130	223,870	50,400	32,430	17,970	27,600	6,800	20,800
Maize	0	5,290	-5,290	0	230	-230	0	60	-60
Peanuts	0	780	-780	0	20	-20	0	40	-40
Soybeans	0	390	-390	0	120	-120	0	0	0
Green beans	0	350	-350	0	20	-20	0	80	-80
Cassava	0	1,820	-1,820	0	50	-50	0	0	0

Table 14.7 (1) Future Crop Production at Kecamatan Level

(Unit: tons)

Kecamatan		Paddy: Irrigated Land Wet Season	Paddy: Irrigated Land Dry Season	Paddy: Rainfed Area Wet Season	Paddy: Rainfed Area Dry Season	Upland Rice	Sub-Total	Maize	Peanuts	Soy Beans	Green Beans	Cassava
Dua Pitue	With Project (A)	70,980	60,720	0	0	0	131,700	0	0	0	0	0
	Without Project (B)	39,300	39,300	16,100	0	20	94,720	880	180	0	0	20
	Increment (A) - (B)	31,680	21,420	-16,100	0	-20	36,980	-880	-180	0	0	-20
Ajangale	With Project (A)	32,400	32,400	0	0	0	64,800	0	0	0	0	0
	Without Project (B)	0	0	7,000	0	0	7,000	1,190	490	0	0	270
	Increment (A) - (B)	32,400	32,400	-7,000	0	0	57,800	-1,190	-490	0	0	-270
Dua Boccoe	With Project (A)	23,400	23,400	0	0	0	46,800	0	0	0	0	0
	Without Project (B)	5,800	5,000	2,500	0	0	13,300	520	100	0	0	1,000
	Increment (A) - (B)	17,600	18,400	-2,500	0	0	33,500	-520	-100	0	0	-1,000
Libureng	With Project (A)	22,200	19,740	0	0	0	41,940	0	0	0	0	0
	Without Project (B)	0	0	4,500	0	250	4,750	1,200	640	0	90	420
	Increment (A) - (B)	22,200	19,740	-4,500	0	-250	37,190	-1,200	-640	0	-90	-420
Kahu	With Project (A)	31,800	31,860	0	0	0	69,660	0	0	0	0	0
	Without Project (B)	2,200	1,000	8,600	0	40	11,840	1,550	1,640	0	20	230
	Increment (A) - (B)	35,600	30,860	-8,600	0	-40	57,820	-1,550	-1,640	0	-20	-230
Lalabata	With Project (A)	39,900	33,720	0	0	0	73,620	0	0	0	0	0
	Without Project (B)	15,800	15,000	11,300	5,500	30	47,630	110	10	60	0	30
	Increment (A) - (B)	24,100	18,720	-11,300	-5,500	-30	25,990	-110	-10	-60	0	-30
Marioriwawo	With Project (A)	6,480	5,400	0	0	0	11,880	0	0	0	0	0
	Without Project (B)	1,200	1,100	2,000	1,900	0	6,200	50	20	0	50	0
	Increment (A) - (B)	5,280	4,300	-2,000	-1,900	0	5,680	-50	-20	0	-50	0

Table 14.7 (2) Future Crop Production at Kecamatan Level

(Unit: tons)

Kecamatan		Paddy: Irrigated Land: Wet Season	Paddy: Irrigated Land: Dry Season	Paddy: Rainfed Area: Wet Season	Paddy: Rainfed Area: Dry Season	Upland Rice	Sub-Total	Maize	Peanuts	Soy Beans	Green Beans	Cassava
Lilirilau	With Project (A)	23,160	23,160	0	0	0	46,320	0	0	0	0	0
	Without Project (B)	4,200	4,500	4,000	0	20	12,720	1,200	0	40	10	0
	Increment (A) - (B)	18,960	18,660	4,000	0	-20	33,600	-1,200	0	-40	-10	0
Liliriaja	With Project (A)	42,960	35,220	0	0	0	78,180	0	0	0	0	0
	Without Project (B)	15,400	15,400	11,000	9,300	30	51,130	640	30	0	30	40
	Increment (A) - (B)	27,560	19,820	-11,000	-9,300	-30	27,050	-640	-30	0	-30	-40
Marioriawa	With Project (A)	5,100	5,100	0	0	0	10,200	0	0	0	0	0
	Without Project (B)	200	300	2,300	0	0	2,800	190	20	100	20	20
	Increment (A) - (B)	4,900	4,800	-2,300	0	0	7,400	-190	-20	-100	-20	-20
Tempe	With Project (A)	540	540	0	0	0	1,080	0	0	0	0	0
	Without Project (B)	0	0	200	0	0	200	10	0	0	0	0
	Increment (A) - (B)	540	540	-200	0	0	880	-10	0	0	0	0
Tanasitolo	With Project (A)	10,800	7,380	0	0	0	18,180	0	0	0	0	0
	Without Project (B)	0	0	4,500	0	0	4,500	100	60	0	180	0
	Increment (A) - (B)	10,800	7,380	-4,500	0	0	13,680	-100	-60	0	-180	0
Maniang Pajo	With Project (A)	26,400	19,260	0	0	0	45,660	0	0	0	0	0
	Without Project (B)	1,900	0	10,900	0	10	12,810	190	140	10	90	70
	Increment (A) - (B)	24,500	19,260	-10,900	0	-10	32,850	-190	-140	-10	-90	-70
Belawa	With Project (A)	22,080	18,300	0	0	0	40,380	0	0	0	0	0
	Without Project (B)	6,500	2,600	6,700	0	0	15,800	160	160	10	50	30
	Increment (A) - (B)	15,580	15,700	-6,700	0	0	24,580	-160	-160	-10	-50	-30

Table 14.7 (3) Future Crop Production at Kecamatan Level

(Unit: tons)

Kecamatan		Paddy						Maize	Peanuts	Soy Beans	Green Beans	Cassava
		Irrigated Land		Rainfed Area		Upland Rice	Sub-Total					
		Wet Season	Dry Season	Wet Season	Dry Season							
Sabbang Paru	With Project (A)	16,800	16,800	0	0	0	33,600	0	0	0	0	0
	Without Project (B)	0	0	5,000	300	150	5,450	340	20	160	40	210
	Increment (A) - (B)	16,800	16,800	-5,000	-300	-150	28,150	-340	-20	-160	-40	-210
Pammana	With Project (A)	39,000	39,000	0	0	0	78,000	0	0	0	0	0
	Without Project (B)	900	0	15,500	0	130	16,530	1,580	150	90	260	300
	Increment (A) - (B)	38,100	39,000	-15,500	0	-130	61,470	-1,580	-150	-90	-260	-300
Takkalalla	With Project (A)	540	540	0	0	0	1,080	0	0	0	0	0
	Without Project (B)	0	0	300	0	0	300	0	0	0	0	0
	Increment (A) - (B)	540	540	-300	0	0	780	0	0	0	0	0
Majauleng	With Project (A)	23,340	23,340	0	0	0	46,680	0	0	0	0	0
	Without Project (B)	0	0	8,500	0	0	8,500	90	60	0	90	0
	Increment (A) - (B)	23,340	23,340	-8,500	0	0	38,180	-90	-60	0	-90	0
Sajoanging	With Project (A)	42,120	42,120	0	0	0	84,240	0	0	0	0	0
	Without Project (B)	0	0	16,900	0	0	16,900	100	100	0	180	0
	Increment (A) - (B)	42,120	42,120	-16,900	0	0	67,340	-100	-100	0	-180	0

Table 15.1 (1) Net Water Demand for Proposed Cropping Pattern

(1) Northern Area

	Apr.		May		June		July		Aug.		Sept.	Oct.		Nov.		Dec.		Jan.		Feb.		Mar.
	Nursery		Transplanting				Terminate Irrigation				Harvest	Nursery		Transplanting				Terminate Irrigation				Harvest
(1) Consumptive use																						
a) Crop coefficient			0.85	1.00	1.20	1.32	1.30	1.12						0.85	1.00	1.20	1.32	1.30	1.12			
				0.85	1.00	1.20	1.32	1.30	1.12						0.85	1.00	1.20	1.32	1.30	1.12		
					0.85	1.00	1.20	1.32	1.30	1.12						0.85	1.00	1.20	1.32	1.30	1.12	
b) Average			0.85	0.93	1.02	1.17	1.27	1.25	1.21	1.12				0.85	0.93	1.02	1.17	1.27	1.25	1.21	1.12	
c) Pan evaporation/1, (mm/month) (Kanyuara)			179		147		161		174					192		166		165		169		
d) Consumptive use, (mm/half-month)			76	83	75	86	102	101	105	97				82	89	85	97	105	103	102	95	
(2) Percolation/2, (mm/half-month)			16	15	15	15	16	15	16	15				15	15	16	15	16	15	14	14	
(3) Cropping intensity			1/3	2/3	1	1	1	1	2/3	1/3				1/3	2/3	1	1	1	1	2/3	1/3	
(4) Sub-total, (d)+(2) x(3), (mm/half-month)			31	65	90	101	118	116	81	37				32	69	101	112	121	118	77	36	
(5) Puddling water, 120 mm		40	40	40									40	40	40							
(6) Nursery water/3, 12 mm	4	4	4									4	4	4								
(7) Net water demand, (4)+(5)+(6), (mm/half-month)	4	44	75	105	90	101	118	116	81	37		4	44	76	109	101	112	121	118	77	36	
- do - , (mm/month)	48		180		191		234		118			48		185		213		239		113		

(2) Southern Area of Lake Tempe

	Mar.	Apr.		May		June		July		Aug.		Sept.	Oct.		Nov.		Dec.		Jan.		Feb.		Mar.
		Nursery		Transplanting				Terminate Irrigation				Harvest	Nursery		Transplanting				Terminate Irrigation				Harvest
(1) Consumptive use																							
a) Crop coefficient			0.85	1.00	1.20	1.32	1.30	1.12						0.85	1.00	1.20	1.32	1.30	1.12			
				0.85	1.00	1.20	1.32	1.30	1.12						0.85	1.00	1.20	1.32	1.30	1.12		
					0.85	1.00	1.20	1.32	1.30	1.12						0.85	1.00	1.20	1.32	1.30	1.12	
b) Average			0.85	0.93	1.02	1.17	1.27	1.25	1.21	1.12				0.85	0.93	1.02	1.17	1.27	1.25	1.21	1.12	
c) Pan evaporation/1, (mm/month) (Sengkang)			153		148		119		136		169			180		169		176		179		
d) Consumptive use, (mm/half-month)			65	69	75	69	76	85	82	95				77	84	86	99	112	110	108	100	
(2) Percolation/2, (mm/half-month)			15	16	15	15	15	16	15	16				15	15	16	15	16	15	14	14	
(3) Cropping intensity			1/3	2/3	1	1	1	1	2/3	1/3				1/3	2/3	1	1	1	1	2/3	1/3	
(4) Sub-total, (d)+(2) x(3), (mm/half-month)			27	57	90	84	91	101	65	37				31	66	102	114	128	125	81	38	
(5) Puddling water, 120 mm		40	40	40									40	40	40							
(6) Nursery water/3, 12 mm	4	4	4										4	4								
(7) Net water demand, (4)+(5)+(6), (mm/half-month)	4	44	71	97	90	84	91	101	65	37			4	44	75	106	102	114	128	125	81	38	
- do - , (mm/month)	4	115		187		175		166		37			48		181		216		253		119		

Table 15.1 (2) Net Water Demand for Proposed Cropping Pattern

(3) Western Area of Lake Tempe

	Mar.	Apr.		May		June		July		Aug.	Sept.	Oct.	Nov.		Dec.		Jan.		Feb.		Mar.
	Nursery		Transplanting				Terminate Irrigation		Harvest			Nursery	Transplanting				Terminate Irrigation				Harvest
(1) Consumptive use																					
a) Crop coefficient		0.85	1.00	1.20	1.32	1.30	1.12						0.85	1.00	1.20	1.32	1.30	1.12			
			0.85	1.00	1.20	1.32	1.30	1.12						0.85	1.00	1.20	1.32	1.30	1.12		
b) Average		0.85	0.93	1.10	1.26	1.31	1.21	1.12					0.85	0.93	1.10	1.26	1.31	1.21	1.12		
c) Pan evaporation/1, (mm/month) (Sengkang)		153		148		119		136					180		169		176		179		
d) Consumptive use, (mm/half-month)		65	69	81	75	78	82	76					77	79	93	111	115	108	100		
(2) Percolation/2, (mm/half-month)		15	16	15	15	15	16	15					15	16	15	16	15	14	14		
(3) Cropping intensity		1/2	1	1	1	1	1	2					1/2	1	1	1	1	1	1/2		
(4) Sub-total, (d)+(2) x(3), (mm/half-month)		40	85	96	90	93	98	46					46	95	108	127	130	112	57		
(5) Puddling water, 120 mm		60	60										60	60							
(6) Nursery water, 12 mm	6	6										6	6								
(7) Net water demand, (4)+(5)+(6), (mm/half-month)	6	66	100	85	96	90	93	98	46			6	66	106	95	108	127	130	122	57	
- do - , , (mm/month)	6	166		181		183		144				6	172		203		257		179		

(4) Eastern Area

	Apr.	May		June		July		Aug.		Sept.	Oct.	Nov.		Dec.		Jan.		Feb.		Mar.
	Nursery	Transplanting				Terminate Irrigation				Harvest	Nursery	Transplanting				Terminate Irrigation				Harvest
(1) Consumptive use																				
a) Crop coefficient		0.85	1.00	1.20	1.32	1.30	1.12					0.85	1.00	1.20	1.32	1.30	1.12			
			0.85	1.00	1.20	1.32	1.30	1.12					0.85	1.00	1.20	1.32	1.30	1.12		
				0.85	1.00	1.20	1.32	1.30	1.12					0.85	1.00	1.20	1.32	1.30	1.12	
b) Average		0.85	0.93	1.02	1.17	1.27	1.25	1.21	1.12			0.85	0.93	1.02	1.17	1.27	1.25	1.21	1.12	
c) Pan evaporation/1, (mm/month) (Sengkang)		148		119		136		169				180		169		176		179		
d) Consumptive use, (mm/half-month)		63	69	61	70	86	85	102	95			77	84	86	99	112	110	108	100	
(2) Percolation/2, (mm/half-month)		16	15	15	15	16	15	16	15			15	15	16	15	16	15	14	14	
(3) Cropping intensity		1/3	2/3	1	1	1	1	2/3	1/3			1/3	2/3	1	1	1	1	2/3	1/3	
(4) Sub-total, (d)+(2) x(3), (mm/half-month)		26	56	76	85	102	100	79	37			31	66	102	114	128	125	81	38	
(5) Puddling water, 120 mm	40	40	40								40	40	40							
(6) Nursery water/3, 12 mm	4 4	4									4 4	4								
(7) Net water demand, (4)+(5)+(6), (mm/half-month)	4 44	70	96	76	85	102	100	79	37		4 44	75	106	102	114	128	125	81	38	
- do - , (mm/month)	48	166		161		202		116			48	181		216		253		119		

Table 15.1 (3) Net Water Demand for Proposed Cropping Pattern

(5) Southern Inland Area

	Mar.	Apr.		May		June		July		Aug.	Sept.	Oct.		Nov.		Dec.		Jan.		Feb.	Mar.
	Nursery			Transplanting					Terminate Irrigation		Harvest	Nursery		Transplanting				Terminate Irrigation			Harvest
(1) Consumptive use																					
a) Crop coefficient			0.85	1.00	1.20	1.32	1.30	1.12					0.85	1.00	1.20	1.32	1.30	1.12			
				0.85	1.00	1.20	1.32	1.30	1.12					0.85	1.00	1.20	1.32	1.30	1.12		
					0.85	1.00	1.20	1.32	1.30	1.12					0.85	1.00	1.20	1.32	1.30	1.12	
b) Average			0.85	0.93	1.02	1.17	1.27	1.25	1.21	1.12			0.85	0.93	1.02	1.17	1.27	1.25	1.21	1.12	
c) Pan evaporation[1], (mm/month) (Camming)		129		111		124		120		136			166	143		135		130		137	
d) Consumptive use, (mm/half-month)			55	51	57	73	79	75	73	76			71	67	73	79	86	82	79	77	
(2) Percolation[2], (mm/half-month)			15	16	15	15	15	16	15	16			15	15	15	16	15	16	15	14	
(3) Cropping intensity			1/3	2/3	1	1	1	1	2/3	1/3			1/3	2/3	1	1	1	1	2/3	1/3	
(4) Sub-total, (d)+(2) x(3), (mm/half-month)			23	45	72	88	94	91	59	31			29	55	88	95	101	98	63	30	
(5) Puddling water, 120 mm		40	40	40									40	40	40						
(6) Nursery water[3], 12 mm	4	4	4									4	4	4							
(7) Net water demand, (4)+(5)+(6), (mm/half-month)	4	44	67	85	72	88	94	91	59	31		4	44	73	95	88	95	101	98	63	30
- do - , (mm/month)	4	111		157		182		150		31		4	117		183		196		161		

(6) North Eastern Area

	Apr.	May		June		July		Aug.		Sept.	Oct.	Nov.		Dec.		Jan.		Feb.		Mar.
	Nursery	Transplanting					Terminate Irrigation			Harvest	Nursery	Transplanting				Terminate Irrigation				Harvest
(1) Consumptive use																				
a) Crop coefficient		0.85		1.00	1.20	1.32	1.30	1.12				0.85	1.00	1.20	1.32	1.30	1.12			
				0.85	1.00	1.20	1.32	1.30	1.12				0.85	1.00	1.20	1.32	1.30	1.12		
					0.85	1.00	1.20	1.32	1.30	1.12				0.85	1.00	1.20	1.32	1.30	1.12	
b) Average		0.85		0.93	1.02	1.17	1.27	1.25	1.21	1.12		0.85	0.93	1.02	1.17	1.27	1.25	1.21	1.12	
c) Pan evaporation[1], (mm/month) (Sengkang)		148		119		136		169		194		180		169		176		179		
d) Consumptive use, (mm/half-month)			63	55	61	80	86	107	102	109		77	84	87	99	112	110	109	101	
(2) Percolation[2], (mm/half-month)			15	15	15	16	15	16	15	15		15	15	16	15	16	15	14	14	
(3) Cropping intensity			1/3	2/3	1	1	1	1	2/3	1/3		1/3	2/3	1	1	1	1	2/3	1/3	
(4) Sub-total, (d)+(2) x(3), (mm/half-month)			26	47	76	96	101	121	78	41		31	66	102	114	128	125	81	38	
(5) Puddling water, 120 mm		40	40	40							40	40	40							
(6) Nursery water[3], 12 mm	4	4	4								4	4								
(7) Net water demand, (4)+(5)+(6), (mm/half-month)	4	44	70	87	76	96	101	121	78	41		75	106	103	114	128	125	81	38	
- do - , (mm/month)	4	114		163		197		199		41		181		216		253		119		

Table 15.1 (4) Net Water Demand for Proposed Cropping Pattern

(7) Northern Area Boya Project

	Apr.	May		June		July		Aug.		Sept.	Oct.	Nov.		Dec.		Jan.		Feb.		Mar.	Apr.
(1) Consumptive use		Nursery		Transplanting				Terminate Irrigation			Harvest	Nursery		Transplanting				Terminate Irrigation			Harvest
(1) Consumptive use																					
a) Crop coefficient		0.85	1.00	1.20	1.32	1.30	1.12					0.85	1.00	1.20	1.32	1.30	1.12				
			0.85	1.00	1.20	1.32	1.30	1.12					0.85	1.00	1.20	1.32	1.30	1.12			
				0.85	1.00	1.20	1.32	1.30	1.12					0.85	1.00	1.20	1.32	1.30	1.12		
b) Average		0.85	0.93	1.02	1.17	1.27	1.25	1.21	1.12			0.85	0.93	1.02	1.17	1.27	1.25	1.21	1.12		
c) Pan evaporation[1], (mm/month) (Kanyuara)		179		147		161		174		188		192		166		165		169		178	
d) Consumptive use, (mm/half-month)		76	68	75	94	102	109	105	105			82	77	85	97	105	106	102	100		
(2) Percolation[2], (mm/half-month)		15	15	15	16	15	16	15	15			15	16	15	16	15	14	14	16		
(3) Cropping intensity		1/3	2/3	1	1	1	1	2/3	1/3			1/3	2/3	1	1	1	1	2/3	1/3		
(4) Sub-total, (d)+(2) x(3), (mm/half-month)		30	55	90	110	117	125	80	40			32	62	100	113	120	120	77	39		
(5) Puddling water, 120 mm	40	40	40									40	40	40							
(6) Nursery water[3], 12 mm	4	4	4									4	4	4							
(7) Net water demand, (4)+(5)+(6), (mm/half-month)	4	44	74	95	90	110	117	125	80	40		4	44	76	102	100	113	120	120	77	39
- do - , (mm/month)	4	118		185		227		205				4	120		202		233		197		39

Table 15.2 (1) Irrigation Water Requirement for Proposed Cropping Pattern

Northern Area

	Description	Unit	Wet Season Paddy							Dry Season Paddy						
			Apr.	May	June	Jul.	Aug.	Sep.	Total	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
(1)	Net water demand (See Table 15.1)	mm	48	180	191	234	118	-	771	48	185	213	239	113	-	798
(2)	Cropping intensity (")	mm	1/6	5/6	1	1	1/2	-	-	1/6	5/6	1	1	1/2	-	-
	1973/74															
(3)	Monthly rainfall at Tanrutedong	mm	365	187	389	114	442	277		179	240	101	37	45	60	
(4)	Effective rainfall	mm	43	109	191	80	118	0	541	21	140	71	26	16	0	274
(5)	Net irrigation requirement	mm	5	71	0	154	0	-	230	27	45	142	213	97	-	524
(6)	Gross irrigation requirement	mm	7	104	0	226	0	-	337	40	66	209	313	143	-	771
(7)	- do -	lit/sec/ha	0.03	0.39	0	0.84	0	-	-	0.15	0.26	0.78	1.17	0.59	-	-
	1974/75															
(3)	Monthly rainfall at Tanrutedong	mm	249	220	159	196	4	442		200	85	41	5	66	45	
(4)	Effective rainfall	mm	29	128	111	137	0	0	405	23	50	29	0	23	0	125
(5)	Net irrigation requirement	mm	19	52	80	97	118	-	366	25	135	184	239	90	-	673
(6)	Gross irrigation requirement	mm	28	76	118	143	174	0	539	37	199	271	351	132	-	990
(7)	- do -	lit/sec/ha	0.11	0.28	0.46	0.53	0.65	-	-	0.14	0.77	1.01	1.31	0.55	-	-
	1975/76															
(3)	Monthly rainfall at Tanrutedong	mm	199	360	259	195	230	372		274	36	37	38	23	173	
(4)	Effective rainfall	mm	23	180	181	137	81	0	606	32	21	26	27	8	0	114
(5)	Net irrigation requirement	mm	25	0	10	97	37	-	165	16	164	187	212	105	-	684
(6)	Gross irrigation requirement	mm	37	0	15	143	54	-	243	24	241	275	312	154	-	1,006
(7)	- do -	lit/sec/ha	0.14	0	0.06	0.53	0.20	-	-	0.09	0.93	1.03	1.16	0.64	-	-
	1976/77															
(3)	Monthly rainfall at Tanrutedong	mm	193	132	339	221	85	0		149	153	31	76	40	66	
(4)	Effective rainfall	mm	23	77	191	155	30	0	476	17	89	22	53	14	0	195
(5)	Net irrigation requirement	mm	25	103	0	79	88	-	295	31	96	191	186	99	-	603
(6)	Gross irrigation requirement	mm	37	151	0	116	129	-	433	46	141	281	274	146	-	888
(7)	- do -	lit/sec/ha	0.14	0.56	0	0.43	0.48	-	-	0.17	0.54	1.05	1.02	0.60	-	-
	1977/78															
(3)	Monthly rainfall at Tanrutedong	mm	223	189	(340)	(114)	(57)	0		15	195	60	(168)	(17)	(219)	
(4)	Effective rainfall	mm	26	110	191	80	20	0	427	2	114	42	118	6	0	282
(5)	Net irrigation requirement	mm	22	70	0	154	98	-	344	46	71	171	121	107	-	516
(6)	Gross irrigation requirement	mm	33	103	0	226	144	-	505	68	104	251	178	157	-	758
(7)	- do -	lit/sec/ha	0.13	0.38	0	0.84	0.54	-		0.25	0.40	0.94	0.66	0.65	-	

Note: /1 Rainfall observed by Diperta is applied except June to Aug. 1977 (PMA Data) and Jan. to Mar. 1978 (DPU Data) shown in parenthesis.

/2 Gross irrigation requirement (lit/sec/ha) in Apr. occurs in latter half month.

Table 15.2 (2) Irrigation Water Requirement for Proposed Cropping Pattern
Southern Area of Lake Tempe

	Description	Unit	Wet Season Paddy							Dry Season Paddy						
			Mar.	Apr.	May	June	Jul.	Aug.	Total	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Total
(1)	Net water demand (See Table 15.1)	mm	4	115	187	175	166	37	684	-	48	181	216	253	119	817
(2)	Cropping intensity (")	mm	-	1/2	1	1	5/6	1/6	-	-	1/6	5/6	1	1	1/2	-
	1973/74															
(3)	Monthly rainfall	mm	268	297	268	243	360	143		290	99	361	224	221	153	
(4)	Effective rainfall	mm	3	104	187	170	166	17	645	0	12	181	157	155	54	559
(5)	Net irrigation requirement	mm	1	11	0	5	0	20	39	-	36	0	59	98	65	258
(6)	Gross irrigation requirement	mm	1	16	0	7	0	29	56	-	53	0	87	144	96	380
(7)	- do -	lit/sec/ha	0.01	0.06	0	0.03	0	0.11	-	-	0.20	0	0.32	0.54	0.40	-
	1974/75															
(3)	Monthly rainfall	mm	267	135	173	161	194	75		52	262	73	71	61	56	
(4)	Effective rainfall	mm	3	47	121	113	113	9	403	0	31	42	50	43	20	186
(5)	Net irrigation requirement	mm	1	68	66	62	53	28	281	-	17	139	166	210	99	631
(6)	Gross irrigation requirement	mm	1	100	97	91	78	41	413	-	25	204	244	309	146	928
(7)	- do -	lit/sec/ha	0.01	0.39	0.36	0.35	0.29	0.15	-	-	0.09	0.79	0.91	1.15	0.60	-
	1975/76															
(3)	Monthly rainfall	mm	110	190	271	171	198	104		158	162	106	132	78	41	
(4)	Effective rainfall	mm	1	67	187	120	116	12	505	0	19	62	92	55	14	242
(5)	Net irrigation requirement	mm	3	48	0	55	50	25	179	-	29	119	124	198	105	575
(6)	Gross irrigation requirement	mm	4	71	0	81	74	37	264	-	43	175	182	291	154	845
(7)	- do -	lit/sec/ha	0.03	0.27	0	0.31	0.28	0.14	-	-	0.16	0.68	0.68	1.09	0.64	-
	1976/77															
(3)	Monthly rainfall	mm	93	173	196	204	153	16		0	149	164	130	302	126	
(4)	Effective rainfall	mm	1	61	137	143	89	2	432	0	17	96	91	211	44	459
(5)	Net irrigation requirement	mm	3	54	50	32	77	35	252	-	31	85	125	42	75	358
(6)	Gross irrigation requirement	mm	4	79	74	47	113	51	369	-	46	125	184	62	110	527
(7)	- do -	lit/sec/ha	0.03	0.30	0.28	0.18	0.42	0.19	-	-	0.17	0.48	0.69	0.23	0.45	-
	1977/78															
(3)	Monthly rainfall	mm	124	169	132	298	60	22		0	0	107	221	101	56	
(4)	Effective rainfall	mm	1	59	92	175	35	3	364	0	0	62	155	71	20	308
(5)	Net irrigation requirement	mm	3	56	95	0	131	34	320	-	48	119	61	182	99	509
(6)	Gross irrigation requirement	mm	4	82	140	0	193	50	471	-	71	175	90	268	146	750
(7)	- do -	lit/sec/ha	0.03	0.32	0.52	0	0.72	0.19	-	-	0.27	0.68	0.34	1.00	0.60	-

Note: /1 Average rainfall of WatanSoppeng and Takalala is applied.

/2 Gross irrigation requirement in Mar. occurs in latter half month.

Table 15.2 (3) Irrigation Water Requirement for Proposed Cropping Pattern

Western Area of Lake Tempe

	Description	Unit	Wet Season Paddy							Dry Season Paddy						
			Mar.	Apr.	May	June	Jul.	Aug.	Total	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Total
(1)	Net water demand (See Table 15.1)	mm	6	166	181	183	144	-	680	0	6	172	203	257	179	817
(2)	Cropping intensity(")	mm	-	3/4	1	1	3/4	-	-	-	-	3/4	1	1	3/4	-
	1973/74															
(3)	Monthly rainfall at WatanSoppeng	mm	-	316	339	324	295	161		236	112	301	103	287	149	
(4)	Effective rainfall	mm	-	166	181	183	144	0	674	0	2	158	72	201	78	511
(5)	Net irrigation requirement	mm	-	0	0	0	0	0	-	-	4	14	131	56	101	306
(6)	Gross irrigation requirement	mm	-	0	0	0	0	-	-	-	6	21	193	82	149	451
(7)	- do -	lit/sec/ha	-	0	0	0	0	-	-	-	0.05	0.08	0.72	0.31	0.62	-
	1974/75															
(3)	Monthly rainfall at WatanSoppeng	mm	199	148	165	90	163	23		80	262	85	66	67	39	
(4)	Effective rainfall	mm	3	78	116	63	86	0	346	0	5	44	46	47	20	162
(5)	Net irrigation requirement	mm	3	88	65	120	58	-	334	-	1	128	157	210	159	655
(6)	Gross irrigation requirement	mm	4	129	96	176	85	-	490	-	1	188	231	309	234	963
(7)	- do -	lit/sec/ha	0.03	0.50	0.36	0.68	0.32	-	-	-	0.01	0.73	0.86	1.15	0.97	-
	1975/76															
(3)	Monthly rainfall at WatanSoppeng	mm	124	199	220	187	240	119		170	161	83	149	71	56	
(4)	Effective rainfall	mm	2	104	154	131	126	0	517	0	3	44	104	50	29	230
(5)	Net irrigation requirement	mm	4	62	27	52	18	-	163	-	3	128	99	207	150	587
(6)	Gross irrigation requirement	mm	6	91	40	76	26	-	239	-	4	188	146	304	221	863
(7)	- do -	lit/sec/ha	0.05	0.35	0.15	0.29	0.10	-	-	-	0.03	0.72	0.55	1.14	0.91	-
	1976/77															
(3)	Monthly rainfall at WatanSoppeng	mm	109	160	217	160	168	16		0	110	228	101	254	123	
(4)	Effective rainfall	mm	2	84	152	112	88	0	438	0	2	120	71	178	65	436
(5)	Net irrigation requirement	mm	4	82	29	71	56	-	242	-	4	52	132	79	114	381
(6)	Gross irrigation requirement	mm	6	121	43	104	82	-	356	-	6	76	194	116	168	560
(7)	- do -	lit/sec/ha	0.05	0.47	0.16	0.40	0.31	-	-	-	0.05	0.29	0.72	0.43	0.69	-
	1977/78															
(3)	Monthly rainfall at WatanSoppeng	mm	132	208	129	300	51	32		0	0	83	186	101	56	
(4)	Effective rainfall	mm	2	109	90	183	27	0	411	0	0	44	130	71	29	274
(5)	Net irrigation requirement	mm	4	57	91	0	117	-	269	-	6	128	73	186	150	543
(6)	Gross irrigation requirement	mm	6	84	134	0	172	-	396	-	9	188	107	274	221	799
(7)	- do -	lit/sec/ha	0.05	0.32	0.50	0	0.64	-	-	-	0.07	0.73	0.40	1.02	0.91	-

Note: /1 Gross irrigation requirement (lit/sec/ha) in Mar. and Oct. occurs in latter half month.

Table 15.2 (4) Irrigation Water Requirement for Proposed Cropping Pattern

Eastern Area

	Description	Unit	Wet Season Paddy							Dry Season Paddy						
			Apr.	May	June	Jul.	Aug.	Sep.	Total	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
(1)	Net water demand (See Table 15.1)	mm	48	166	161	202	116	-	693	48	181	216	258	119	-	822
(2)	Cropping intensity(")	mm	1/6	5/6	1	1	1/2	-	-	1/6	5/6	1	1	1/2	-	-
	1970/71/1															
(3)	Monthly rainfall at Sengkang	mm	88	256	245	300	171	306		160	286	23	3	5	9	
(4)	Effective rainfall	mm	10	149	161	202	60	0	582	19	167	16	0	0	0	202
(5)	Net irrigation requirement	mm	38	17	0	0	56	0	111	29	18	200	258	119	-	620
(6)	Gross irrigation requirement	mm	56	25	0	0	82	-	163	43	26	294	379	175	-	912
(7)	- do -	lit/sec/ha	0.22	0.09	0	0	0.31	-	-	0.16	0.10	1.10	1.42	0.72	-	-
	1974/75															
(3)	Monthly rainfall at Sengkang/2	mm	-	33	130	234	49	185		150	106	22	13	52	9	
(4)	Effective rainfall	mm	0	19	91	164	17	0	291	18	62	15	9	18	0	122
(5)	Net irrigation requirement	mm	48	147	70	38	99	-	402	30	119	201	249	101	-	700
(6)	Gross irrigation requirement	mm	71	216	103	56	146	-	592	44	175	296	366	149	-	1,030
(7)	- do -	lit/sec/ha	0.27	0.81	0.40	0.21	0.55	-	-	0.16	0.68	1.11	1.37	0.62	-	-
	1975/76															
(3)	Monthly rainfall at Sengkang/2	mm	120	88	152	42	110	289		112	56	30	34	21	80	
(4)	Effective rainfall	mm	14	51	106	29	39	0	239	13	33	21	24	7	0	98
(5)	Net irrigation requirement	mm	34	115	55	173	77	-	454	35	148	195	234	112	-	724
(6)	Gross irrigation requirement	mm	50	169	81	254	113	-	667	51	218	287	344	165	-	1,065
(7)	- do -	lit/sec/ha	0.19	0.63	0.31	0.95	0.42	-	-	0.19	0.84	1.07	1.28	0.68	-	-
	1976/77															
(3)	Monthly rainfall at Sengkang/2	mm	151	201	218	369	31	0		105	135	46	91	64	130	
(4)	Effective rainfall	mm	18	117	153	202	11	0	501	12	79	32	64	22	0	209
(5)	Net irrigation requirement	mm	30	49	8	0	105	-	192	36	102	184	194	97	-	613
(6)	Gross irrigation requirement	mm	44	72	12	0	154	-	282	53	218	271	285	143	-	902
(7)	- do -	lit/sec/ha	0.17	0.27	0.05	0	0.57	-	-	0.20	0.84	1.01	1.06	0.59	-	-
	1977/78															
(3)	Monthly rainfall at Sengkang/2	mm	228	102	284	73	62	0		0	88	56	97	44	186	
(4)	Effective rainfall	mm	27	60	161	51	22	0	321	0	51	39	68	15	0	173
(5)	Net irrigation requirement	mm	21	106	0	151	94	-	372	48	130	177	190	104	-	649
(6)	Gross irrigation requirement	mm	31	156	0	222	138	-	547	71	191	260	279	153	-	954
(7)	- do -	lit/sec/ha	0.12	0.58	0	0.83	0.52	-	0	0.27	0.74	0.97	1.04	0.63	-	-

Note: /1 Lacking of rainfall records at Sengkang for 2 years from Jan. 1972 to Apr. 1974 and using available rainfall records at Sengkang for 1970/71 observed by Diperta.

/2 Rainfall records observed by P3SA is applied.

Table 15.2 (5) Irrigation Water Requirement for Proposed Cropping Pattern

North Eastern Area

	Description	Unit	Wet Season Paddy							Dry Season Paddy						
			Apr.	May	June	Jul.	Aug.	Sep.	Total	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
(1)	Net water demand (See Table 15.1)	mm	4	114	163	197	199	41	718	48	181	217	253	120	-	819
(2)	Cropping intensity(")	mm	-	1/2	1	1	5/6	1/6	-	1/6	5/6	1	1	1/2	-	-
	1973/74															
(3)	Monthly rainfall at Sakkoli (Paria)	mm	(209)	(368)	0	486	293	670		117	(82)	(90)	(35)	(38)	46	
(4)	Effective rainfall	mm	2	114	0	197	171	41	525	14	48	63	25	13	0	163
(5)	Net irrigation requirement	mm	2	0	163	0	28	0	193	34	133	154	228	107	-	656
(6)	Gross irrigation requirement	mm	3	0	240	0	41	0	284	50	196	226	335	157	0	964
(7)	- do -	lit/sec/ha	0.02	0	0.95	0	0.15	0	-	0.19	0.76	0.84	1.25	0.65	-	-
	1974/75															
(3)	Monthly rainfall at Sakkoli	mm	183	452	60	445	3	70		337	95	0	45	63	46	
(4)	Effective rainfall	mm	2	114	42	197	0	8	363	39	55	0	32	22	0	148
(5)	Net irrigation requirement	mm	2	0	121	0	199	33	355	5	126	217	221	98	-	671
(6)	Gross irrigation requirement	mm	3	0	178	0	293	49	523	13	185	319	325	144	-	986
(7)	- do -	lit/sec/ha	0.02	0	0.69	0	1.09	0.19	-	0.05	0.71	1.19	1.21	0.60	-	-
	1975/76															
(3)	Monthly rainfall at Sakkoli	mm	265	437	372	253	173	521		309	126	29	4	2	149	
(4)	Effective rainfall	mm	3	114	163	177	101	41	599	26	74	20	0	0	0	118
(5)	Net irrigation requirement	mm	1	0	0	20	98	0	119	22	107	197	253	120	0	699
(6)	Gross irrigation requirement	mm	1	0	0	29	144	0	174	32	157	290	372	176	-	1,027
(7)	- do -	lit/sec/ha	0.01	0	0	0.11	0.54	0	-	0.12	0.61	1.08	1.39	0.73	-	-
	1976/77															
(3)	Monthly rainfall at Sakkoli	mm	396	371	584	360	45	0		186	172	178	105	81	111	
(4)	Effective rainfall	mm	4	114	163	197	26	0	504	22	100	125	74	28	0	349
(5)	Net irrigation requirement	mm	0	0	0	0	173	41	214	26	81	92	179	92	-	470
(6)	Gross irrigation requirement	mm	0	0	0	0	254	60	314	38	119	135	263	135	-	690
(7)	- do -	lit/sec/ha	0	0	0	0	0.95	0.23	-	0.15	0.46	0.50	0.98	0.56	-	-
	1977/78															
(3)	Monthly rainfall at Sakkoli (Paria)	mm	29	231	405	253	44	-		40	215	311	(107)	(25)	213	
(4)	Effective rainfall	mm	0	81	163	177	26	0	447	5	125	217	75	9	0	431
(5)	Net irrigation requirement	mm	4	33	0	20	173	41	271	43	56	0	178	111	-	388
(6)	Gross irrigation requirement	mm	6	49	0	29	254	60	398	63	82	0	262	163	-	570
(7)	- do -	lit/sec/ha	0.05	0.18	0	0.11	0.95	0.23	-	0.24	0.32	0	0.98	0.67	-	-

Note: Gross irrigation requirement in Apr. occurs in latter half month.

Table 15.2 (6) Irrigation Water Requirement for Proposed Cropping Pattern

Southern Inland Area

	Description	Unit	Wet Season Paddy							Dry Season Paddy						
			Mar.	Apr.	May	June	Jul.	Aug.	Total	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Total
(1)	Net water demand (See Table 15.1)	mm	4	111	157	182	150	31	635	4	117	183	196	161	30	691
(2)	Cropping intensity(")	mm	-	1/2	1	1	5/6	1/6	-	-	1/2	1	1	5/6	1/6	-
	1973/74															
(3)	Monthly rainfall at Maradda	mm	141	211	196	411	377	194		212	116	61	82	22	134	
(4)	Effective rainfall	mm	2	74	137	182	150	23	556	2	41	43	57	13	16	172
(5)	Net irrigation requirement	mm	2	37	20	0	0	8	65	2	76	140	139	148	14	519
(6)	Gross irrigation requirement	mm	3	54	29	0	0	12	95	3	112	206	204	218	21	764
(7)	- do -	lit/sec/ha	0.02	0.21	0.11	0	0	0.04	-	0.02	0.42	0.79	0.76	0.81	0.09	-
	1974/75															
(3)	Monthly rainfall at Maradda	mm	129	158	177	282	257	33		214	253	54	29	118	30	
(4)	Effective rainfall	mm	2	55	124	182	150	4	517	2	89	38	20	69	4	222
(5)	Net irrigation requirement	mm	2	56	33	0	0	27	120	2	28	145	176	92	26	469
(6)	Gross irrigation requirement	mm	3	82	49	0	0	40	177	3	41	213	259	135	38	689
(7)	- do -	lit/sec/ha	0.02	0.32	0.18	0	0	0.15	-	0.02	0.15	0.82	0.97	0.50	0.16	-
	1975/76															
(3)	Monthly rainfall at Maradda	mm	71	157	480	373	406	268		185	229	62	92	95	40	
(4)	Effective rainfall	mm	1	55	157	182	150	31	576	2	80	43	64	55	5	249
(5)	Net irrigation requirement	mm	3	56	0	0	0	0	59	2	37	140	132	106	25	442
(6)	Gross irrigation requirement	mm	4	82	0	0	0	0	86	3	54	206	194	156	37	650
(7)	- do -	lit/sec/ha	0.03	0.32	0	0	0	0	-	0.02	0.20	0.79	0.72	0.58	0.15	-
	1976/77															
(3)	Monthly rainfall at Maradda	mm	141	400	309	366	130	0		0	22	102	239	82	35	
(4)	Effective rainfall	mm	2	111	157	182	76	0	528	0	8	71	167	48	4	298
(5)	Net irrigation requirement	mm	2	0	0	0	74	31	107	4	109	112	29	113	26	393
(6)	Gross irrigation requirement	mm	3	0	0	0	109	46	158	6	160	165	43	166	38	578
(7)	- do -	lit/sec/ha	0.02	0	0	0	0.41	0.17	-	0.05	0.60	0.64	0.16	0.62	0.16	-
	1977/78															
(3)	Monthly rainfall at Maradda	mm	117	199	132	640	52	0		0	0	6	309	93	47	
(4)	Effective rainfall	mm	1	70	92	182	30	0	375	0	0	0	196	54	5	255
(5)	Net irrigation requirement	mm	3	41	65	0	120	31	260	4	117	183	0	107	25	436
(6)	Gross irrigation requirement	mm	4	60	96	0	176	46	382	6	172	269	0	157	37	641
(7)	- do -	lit/sec/ha	0.03	0.23	0.36	0	0.66	0.17	-	0.05	0.64	1.04	0	0.59	0.15	-

Note: Gross irrigation requirement (lit/sec/ha) in Mar. and Sep. occurs in latter half month.

Table 15.2 (7) Irrigation Water Requirement for Proposed Cropping Pattern

Northern Area Boya Project

	Description	Unit	Wet Season Paddy							Dry Season Paddy						
			Apr.	May	June	Jul.	Aug.	Sep.	Total	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
(1)	Net water demand (See Table 15.1)	mm	4	118	185	227	205	40	779	4	120	202	233	197	39	795
(2)	Cropping intensity(")	mm	-	1/2	1	1	5/6	1/6	-	-	1/2	1	1	5/6	1/6	-
	1973/74															
(3)	Monthly rainfall at Tanrutedong	mm	365	187	389	114	442	277		179	240	101	37	45	60	
(4)	Effective rainfall	mm	4	65	185	80	205	32	571	2	84	71	26	26	7	216
(5)	Net irrigation requirement	mm	0	53	0	147	0	8	208	2	36	131	217	171	32	589
(6)	Gross irrigation requirement	mm	0	78	0	216	0	12	306	3	53	193	304	251	47	851
(7)	- do -	lit/sec/ha	0	0.29	0	0.81	0	0.05	-	0.02	0.20	0.72	1.14	1.04	0.18	-
	1974/75															
(3)	Monthly rainfall at Tanrutedong	mm	249	220	159	196	4	442		200	85	41	5	66	45	
(4)	Effective rainfall	mm	3	77	111	137	0	40	368	2	30	29	0	39	5	105
(5)	Net irrigation requirement	mm	1	41	74	90	205	0	411	2	90	173	233	158	34	690
(6)	Gross irrigation requirement	mm	1	60	109	132	301	0	603	3	132	254	343	232	50	1,014
(7)	- do -	lit/sec/ha	0.01	0.22	0.42	0.49	1.12	0	-	0.02	0.51	0.95	1.28	0.96	0.19	-
	1975/76															
(3)	Monthly rainfall at Tanrutedong	mm	199	360	259	195	230	372		274	36	37	38	23	173	
(4)	Effective rainfall	mm	2	118	181	137	134	40	612	3	13	26	27	13	20	102
(5)	Net irrigation requirement	mm	2	0	4	90	71	0	167	1	107	176	206	184	19	693
(6)	Gross irrigation requirement	mm	3	0	6	132	104	0	245	1	157	259	303	271	28	1,019
(7)	- do -	lit/sec/ha	0.02	0	0.02	0.49	0.39	0	-	0.01	0.61	0.97	1.13	1.12	0.10	-
	1976/77															
(3)	Monthly rainfall at Tanrutedong	mm	193	132	339	221	85	0		149	153	31	76	40	66	
(4)	Effective rainfall	mm	2	46	185	155	50	0	438	2	54	22	53	23	8	162
(5)	Net irrigation requirement	mm	2	72	0	72	155	40	341	2	66	180	180	174	31	633
(6)	Gross irrigation requirement	mm	3	106	0	106	228	59	502	3	97	265	265	256	46	932
(7)	- do -	lit/sec/ha	0.02	0.40	0	0.40	0.85	0.23	-	0.02	0.37	0.99	0.99	1.06	0.17	-
	1977/78															
(3)	Monthly rainfall at Tanrutedong	mm	223	189	(340)	(114)	(57)	0		15	195	60	(168)	(17)	(219)	
(4)	Effective rainfall	mm	3	66	185	80	33	0	367	0	68	42	118	10	26	264
(5)	Net irrigation requirement	mm	1	52	0	117	172	40	382	4	52	160	115	187	13	531
(6)	Gross irrigation requirement	mm	1	76	0	216	253	59	605	6	76	235	169	275	19	780
(7)	- do -	lit/sec/ha	0.01	0.28	0	0.81	0.96	0.23	-	0.05	0.29	0.88	0.63	1.14	0.07	-

Note: /1 Rainfall observed by Diperta is applied except June to Aug. 1977 (PMA Data) and Jan. to Mar. 1978 (DPU Data) shown in parenthesis.

Table 15.3 Irrigable Area in Langkemme Irrigation Project

(Unit : ha)

Irrigation Block/Kecamatan		Total Area		Present Land Use				Non-Irr'ble Area
				Paddy Field		Upland Field		
		Gross	(Net)	Gross	(Net)	Gross	(Net)	
I	Marioriwawo							
	Cennae Ex. 1/2-T. sys.	240	(220)	240	(220)	0	(0)	0
	Others	230	(70)	80	(70)	0	(0)	150
	Sub-total	470	(290)	320	(290)	0	(0)	150
II	Marioriwawo	680	(90)	100	(90)	0	(0)	580
III	"	1,400	(150)	170	(150)	0	(0)	1,230
IV	"	215	(140)	155	(140)	0	(0)	60
V-a	"	285	(230)	255	(230)	0	(0)	30
V-b	Liliriaja	160	(100)	110	(100)	0	(0)	50
	Sub-total	445	(330)	365	(330)	0	(0)	80
VI	Liliriaja	880	(630)	700	(630)	0	(0)	180
VII	"	780	(340)	380	(340)	0	(0)	400
VIII-a	"	1,520	(1,100)	1,230	(1,100)	0	(0)	290
VIII-b	Lalabata	330	(250)	270	(250)	0	(0)	60
	Sub-total	1,850	(1,350)	1,500	(1,350)	0	(0)	350
IX-a	Liliriaja	260	(160)	180	(160)	0	(0)	80
IX-b	Lalabata	730	(450)	500	(450)	0	(0)	230
	Sub-total	990	(610)	680	(610)	0	(0)	310
X-a	Liliriaja	350	(270)	300	(270)	0	(0)	50
X-b	Lalabata	1,040	(800)	880	(800)	0	(0)	160
	Sub-total	1,390	(1,070)	1,180	(1,070)	0	(0)	210
Total		9,100	(5,000)	5,550	(5,000)	0	(0)	3,550
Kab. Soppeng	Marioriwawo	3,050	(900)	1,000	(900)	0	(0)	2,050
	Exist.	240	(220)	240	(220)	0	(0)	0
	Others	2,810	(680)	760	(680)	0	(0)	2,050
	Liliriaja	3,950	(2,600)	2,900	(2,600)	0	(0)	1,050
	Lalabata	2,100	(1,500)	1,650	(1,500)	0	(0)	450

Table 15.4 (1) Irrigable Area in Bila Irrigation Project
(Case 1:Downstream Weir)

(Unit : ha)

Irrigation Block/Kecamatan	Total Area		Present Land Use				
			Paddy Field		Upland Field		Non-Irr'ble Area
	Gross	(Net)	Gross	(Net)	Gross	(Net)	
Right Bank							
R - 1 Duapitue	700	(470)	520	(470)	0	(0)	180
R - 2 "	1,000	(730)	810	(730)	0	(0)	190
Total (Right Bank)	1,700	(1,200)	1,330	(1,200)	0	(0)	370
Left Bank							
L - 1 Duapitue	730	(200)	220	(200)	0	(0)	510
L - 2 - a "	1,660	(1,100)	1,110	(1,000)	150	(100)	400
L - 2 - b Maniangpajo	200	(150)	170	(150)	0	(0)	30
Sub-total	1,860	(1,250)	1,280	(1,150)	150	(100)	430
L - 3 - a Duapitue	1,940	(1,560)	1,740	(1,560)	0	(0)	200
L - 3 - b Belawa	1,730	(1,240)	1,320	(1,190)	70	(50)	340
Sub-total	3,670	(2,800)	3,060	(2,750)	70	(50)	540
L - 4 - a Maniangpajo	2,520	(2,000)	2,170	(1,950)	70	(50)	280
L - 4 - b Belawa	470	(210)	230	(210)	0	(0)	240
Sub-total	2,990	(2,210)	2,400	(2,160)	70	(50)	520
L - 5 Maniangpajo							
Salodua Ex. 1/2-T. sys.	580	(520)	580	(520)	0	(0)	0
Others	1,080	(880)	980	(880)	0	(0)	100
Sub-total	1,660	(1,400)	1,560	(1,400)	0	(0)	100
L - 6 Tanasitolo	1,030	(760)	840	(760)	0	(0)	190
L - 7 "	960	(680)	760	(680)	0	(0)	200
Total (Left Bank)	12,900	(9,300)	10,120	(9,100)	290	(200)	2,490
Total	14,600	(10,500)	11,450	(10,300)	290	(200)	2,860
Kab. Sidrap; Duapitue	6,030	(4,060)	4,400	(3,960)	150	(100)	1,480
Kab. Wajo; Maniangpajo	4,380	(3,550)	3,900	(3,500)	70	(50)	410
Exist. sys.	580	(520)	580	(520)	0	(0)	0
Others	3,800	(3,030)	3,320	(2,980)	70	(50)	410
Belawa	2,200	(1,450)	1,550	(1,400)	70	(50)	580
Tanasitolo	1,990	(1,440)	1,600	(1,440)	0	(0)	390
Total(Wajo)	8,570	(6,440)	7,050	(6,340)	140	(100)	1,380

Table 15.4 (2) Irrigable Area in Bila Irrigation Project
(Case 2 : Middlestream Weir)

(Unit : ha)

Irrigation Block /Kecamatan		Total Area		Present Land Use				
				Paddy Field		Upland Field		Non-Irr'ble Area
		Gross	(Net)	Gross	(Net)	Gross	(Net)	
Right Bank								
R - 1	Duapitue	700	(470)	520	(470)	0	(0)	180
R - 2	"	1,000	(730)	810	(730)	0	(0)	190
Total (Right Bank)		1,700	(1,200)	1,330	(1,200)	0	(0)	370
Left Bank								
L - 1	Duapitue	730	(200)	220	(200)	0	(0)	510
L - 2 - a	"	1,660	(1,100)	1,110	(1,000)	150	(100)	400
L - 2 - b	Maniangpajo	200	(150)	170	(150)	0	(0)	30
	Sub-total	1,860	(1,250)	1,280	(1,150)	150	(100)	430
L - 3 - a	Duapitue	1,940	(1,560)	1,740	(1,560)	0	(0)	200
L - 3 - b	Belawa	1,730	(1,240)	1,320	(1,190)	70	(50)	340
	Sub-total	3,670	(2,800)	3,060	(2,750)	70	(50)	540
L - 4 - a	Maniangpajo	2,520	(2,000)	2,170	(1,950)	70	(50)	280
L - 4 - b	Belawa	470	(210)	230	(210)	0	(0)	240
	Sub-total	2,990	(2,210)	2,400	(2,160)	70	(50)	520
L - 5	Maniangpajo							
	Salodua Ex. 1/2-T. Sys.	580	(520)	580	(520)	0	(0)	0
	Others	1,080	(880)	980	(880)	0	(0)	100
	Sub-total	1,660	(1,400)	1,560	(1,400)	0	(0)	100
L - 6	Tanasitolo	1,390	(940)	1,040	(940)	0	(0)	350
Total (Left Bank)		12,300	(8,800)	9,560	(8,600)	290	(200)	2,450
TOTAL		14,000	(10,000)	10,890	(9,800)	290	(200)	2,820
Kab. Sidrap;	Duapitue	6,030	(4,060)	4,400	(3,960)	150	(100)	1,480
Kab. Wajo;	Maniangpajo	4,380	(3,550)	3,900	(3,500)	70	(50)	410
	Exist. sys.	580	(520)	580	(520)	0	(0)	0
	Others	3,800	(3,030)	3,320	(2,980)	70	(50)	410
	Belawa	2,200	(1,450)	1,550	(1,400)	70	(50)	580
	Tanasitolo	1,390	(940)	1,040	(940)	0	(0)	350
	Total (Wajo)	7,970	(5,940)	6,490	(5,840)	140	(100)	1,340

Table 15.4 (3) Irrigable Area in Bila Irrigation Project
(Case 3:With Storage Dam)

(Unit : ha)

Irrigation Block/Kecamatan		Total Area		Present Land Use				
				Paddy Field		Upland Field		Non-Irr'ble Area
		Gross	(Net)	Gross	(Net)	Gross	(Net)	
Right Bank								
R - 1	Duapitue	700	(470)	520	(470)	0	(0)	180
R - 2	"	1,000	(730)	810	(730)	0	(0)	190
Total	(Right Bank)	1,700	(1,200)	1,330	(1,200)	0	(0)	370
Left Bank								
L - 1	Duapitue	910	(220)	240	(220)	0	(0)	670
L - 2 - a	"	2,280	(1,320)	1,300	(1,170)	220	(150)	760
L - 2 - b	Maniangpajo	350	(200)	220	(200)	0	(0)	130
	Sub-total	2,630	(1,520)	1,520	(1,370)	220	(150)	890
L - 3 - a	Duapitue	1,940	(1,560)	1,740	(1,560)	0	(0)	200
L - 3 - b	Belawa	1,730	(1,240)	1,320	(1,190)	70	(50)	340
	Sub-total	3,670	(2,800)	3,060	(2,750)	70	(50)	540
L - 4 - a	Maniangpajo	2,690	(2,100)	2,280	(2,050)	70	(50)	340
L - 4 - b	Belawa	470	(210)	230	(210)	0	(0)	240
	Sub-total	3,160	(2,310)	2,510	(2,260)	70	(50)	580
L - 5	Maniangpajo							
	Salodua Ex. 1/2-T. sys.	580	(520)	580	(520)	0	(0)	0
	Others	1,570	(1,280)	1,420	(1,280)	0	(0)	150
	Sub-total	2,150	(1,800)	2,000	(1,800)	0	(0)	150
L - 6	Tanasitolo	1,260	(960)	1,070	(960)	0	(0)	190
L - 7	"	1,520	(1,190)	1,320	(1,190)	0	(0)	200
Total	(Left Bank)	15,300	(10,800)	11,720	(10,550)	360	(250)	3,220
Total		17,000	(12,000)	13,050	(11,750)	360	(250)	3,590
Kab. Sidrap; Duapitue		6,830	(4,300)	4,610	(4,150)	220	(150)	2,000
Kab. Wajo; Maniangpajo		5,190	(4,100)	4,500	(4,050)	70	(50)	620
	Exist. sys.	580	(520)	580	(520)	0	(0)	0
	Others	4,610	(3,580)	3,920	(3,530)	70	(50)	620
	Belawa	2,200	(1,450)	1,550	(1,400)	70	(50)	580
	Tanasitolo	2,780	(2,150)	2,390	(2,150)	0	(0)	390
	Total (Wajo)	10,170	(7,700)	8,440	(7,600)	140	(100)	1,590

Table 15.5 Irrigable Area in Sanrego Irrigation Project

(Unit : ha)

Irrigation Block/Kecamatan		Total Area		Present Land Use				
				Paddy Field		Upland Field		Non-Irr'ble Area
		Gross	(Net)	Gross	(Net)	Gross	(Net)	
Right Bank								
R - 1	Kahu	1,430	(990)	1,100	(990)	0	(0)	330
R - 2	"							
	Maradda Ex. 1/2-T.Sys.	480	(430)	480	(430)	0	(0)	0
	Others	440	(240)	270	(240)	0	(0)	170
	Sub-total	920	(670)	750	(670)	0	(0)	170
R - 3	Kahu	1,080	(620)	690	(620)	0	(0)	390
R - 4	"	1,040	(630)	660	(590)	60	(40)	320
R - 5 - a	"	590	(450)	500	(450)	0	(0)	90
R - 5 - b	"	500	(320)	300	(270)	70	(50)	130
R - 5 - c	Salomekko	300	(200)	220	(200)	0	(0)	80
	Sub-total	1,390	(970)	1,020	(920)	70	(50)	300
R - 6 - a	Kahu	750	(530)	480	(430)	140	(100)	130
R - 6 - b	Tonra	400	(250)	220	(200)	80	(50)	100
	Sub-total	1,150	(780)	700	(630)	220	(150)	230
R - 7 - a	Kahu	780	(490)	430	(390)	140	(100)	210
R - 7 - b	Tonra	300	(150)	170	(150)	0	(0)	130
	Sub-total	1,080	(640)	600	(540)	140	(100)	340
R - 8 - a	Libureng	1,210	(560)	260	(230)	470	(330)	480
R - 8 - b	"	800	(380)	200	(180)	290	(200)	310
	Sub-total	2,010	(940)	460	(410)	760	(530)	790
R - 9	Libureng	2,180	(1,050)	500	(450)	860	(600)	820
R - 10	"	1,270	(410)	140	(130)	400	(280)	730
Total (Right Bank)		13,550	(7,700)	6,620	(5,950)	2,510	(1,750)	4,420
Left Bank								
L - 1 - a	Kahu	800	(570)	600	(540)	50	(30)	150
L - 1 - b	Libureng	550	(400)	440	(400)	0	(0)	110
	Sub-total	1,350	(970)	1,040	(940)	50	(30)	260
L - 2 - a	Kahu	400	(300)	290	(260)	70	(40)	40
L - 2 - b	Libureng	1,120	(720)	770	(690)	50	(30)	300
	Sub-total	1,520	(1,020)	1,060	(950)	120	(70)	340
L - 3 - a	Kahu	450	(130)	110	(100)	50	(30)	290
L - 3 - b	Libureng	630	(180)	190	(160)	30	(20)	410
	Sub-total	1,080	(310)	300	(260)	80	(50)	700
Total (Left Bank)		3,950	(2,300)	2,400	(2,150)	250	(150)	1,300
Total		17,500	(10,000)	9,020	(8,100)	2,760	(1,900)	5,720

Table 15.6 Irrigable Area in Lawo Irrigation Proejct

(Unit : ha)

Irrigation Block/Kecamatan	Total Area		Present Land Use				
			Paddy Field		Upland Field		Non-Irr'ble Area
	Gross	(Net)	Gross	(Net)	Gross	(Net)	
I - a Lalabata							
Tinco Ex. 1/2-T. Sys.	170	(150)	170	(150)	0	(0)	0
Others	630	(300)	330	(300)	0	(0)	300
Sub-total	800	(450)	500	(450)	0	(0)	300
I - b Liliriaja	110	(100)	110	(100)	0	(0)	0
Total (Block - I)	910	(550)	610	(550)	0	(0)	300
II Lalabata	1,110	(670)	740	(670)	0	(0)	370
III - a Lalabata							
Tinco Ex. 1/2-T. Sys.	390	(350)	390	(350)	0	(0)	0
Others	650	(330)	370	(330)	0	(0)	280
Sub-total	1,040	(680)	760	(680)	0	(0)	280
III - b Liliriaja	1,340	(1,100)	1,220	(1,100)	0	(0)	120
Total (Block - III)	2,380	(1,780)	1,980	(1,780)	0	(0)	400
Total	4,400	(3,000)	3,330	(3,000)	0	(0)	1,070
Kab. Soppeng; Lalabata	2,950	(1,800)	2,000	(1,800)	0	(0)	950
Exist. sys.	560	(500)	560	(500)	0	(0)	0
Others	2,390	(1,300)	1,440	(1,300)	0	(0)	950
Liliriaja	1,450	(1,200)	1,330	(1,200)	0	(0)	120

Table 15.7 Irrigable Area in Boya Irrigation Project

(Unit : ha)

Irrigation Block/Kecamatan	Total Area		Present Land Use				
			Paddy Field		Upland Field		Non-Irr'ble Area
	Gross	(Net)	Gross	(Net)	Gross	(Net)	
Bulucenrana exist. Tech. sys.							
Duapitue	6,960	(6,260)	6,960	(6,260)	0	(0)	0
Ext.-1 "	710	(230)	260	(230)	0	(0)	450
Ext.-2 "	810	(420)	470	(420)	0	(0)	340
Ext.-3 "	350	(150)	170	(150)	0	(0)	180
Ext.-4 "	370	(220)	250	(220)	0	(0)	120
Ext.-5-a "	300	(200)	220	(200)	0	(0)	80
Ext.-5-b Belawa	1,370	(600)	670	(600)	0	(0)	700
Sub-total	1,670	(800)	890	(800)	0	(0)	780
Ext.-6-a Duapitue							
Lancirang Ex. 1/2-T. Sys.	320	(290)	320	(290)	0	(0)	0
Ext.-6-b Belawa							
Lancirang Ex. 1/2-T. Sys.	140	(130)	140	(130)	0	(0)	0
Belawa Exist. 1/2-T. Sys.	1,670	(1,500)	1,670	(1,500)	0	(0)	0
Sub-total	1,810	(1,630)	1,810	(1,630)	0	(0)	0
Total (Ext.-6)	2,130	(1,920)	2,130	(1,920)	0	(0)	0
Total	13,000	(10,000)	11,130	(10,000)	0	(0)	1,870
Kab. Sidrap; Duapitue	9,820	(7,770)	8,650	(7,770)	0	(0)	1,870
Ex. Tech. s.	6,960	(6,260)	6,960	(6,260)	0	(0)	0
Ex. 1/2-T.s.	320	(290)	320	(290)	0	(0)	0
Ex. total	7,280	(6,550)	7,280	(6,550)	0	(0)	0
Others	2,540	(1,220)	1,370	(1,220)	0	(0)	1,870
Kab. Wajo; Belawa	2,500	(2,230)	2,480	(2,230)	0	(0)	0
Ex.1/2-T. s.	1,800	(1,630)	1,810	(1,630)	0	(0)	0
Others	700	(600)	670	(600)	0	(0)	0

Table 15.8 (1) Irrigable Area in Walanae Irrigation Project (1/2)

(Unit : ha)

Irrigation Block/Kecamatan	Total Area		Present Land Use				
			Paddy Field		Upland Field		Non-Irr'ble Area
	Gross	(Net)	Gross	(Net)	Gross	(Net)	
Right Bank of the Cenranae							
R - X Duabocoe							
Unyi Exist.1/2-T.Sys.	2,900	(2,500)	1,900	(1,700)	1,000	(800)	0
R - IX a Duabocoe	2,300	(1,400)	1,450	(1,300)	150	(100)	700
R - IX b Ajangale	600	(400)	450	(400)	0	(0)	150
Sub-total (R - IX)	2,900	(1,800)	1,900	(1,700)	150	(100)	850
R - VIII Ajangale	3,000	(2,000)	2,000	(1,800)	300	(200)	700
R - VII Ajangale	2,300	(1,500)	1,300	(1,200)	400	(300)	600
R - VI a Ajangale	2,300	(1,500)	1,100	(1,000)	700	(500)	500
R - VI b Pammana	1,300	(900)	900	(800)	150	(100)	250
Sub-total (R - VI)	2,600	(2,400)	2,000	(1,800)	850	(600)	750
R - V Pammana							
Bulupatira Ex.1/2-T.s.	270	(240)	270	(240)	0	(0)	0
Others	3,830	(3,060)	3,030	(2,760)	400	(300)	400
Sub-total (R - V)	4,100	(3,300)	3,300	(3,000)	400	(300)	400
R - IV Pammana	3,000	(2,300)	2,200	(2,000)	400	(300)	400
Total (Right B. Cenranae)	21,800	(15,800)	14,600	(13,200)	3,500	(2,600)	3,700
Right Bank of the Walanae							
R - III a Sabbangparu	2,200	(1,400)	1,150	(1,000)	600	(400)	450
R - III b Lilirilau							
Takku Exist. 1/2-T. s.	510	(460)	510	(460)	0	(0)	0
Others	290	(140)	40	(40)	150	(100)	100
Sub-total (Lilirilau)	800	(600)	550	(500)	150	(100)	100
Total (R - III)	3,000	(2,000)	1,700	(1,500)	750	(500)	550
R - II Lilirilau	3,000	(1,600)	1,000	(900)	1,200	(700)	800
R - I a Liliriaja							
Paroto Exist. 1/2-T.S.	300	(270)	300	(270)	0	(0)	0
Others	850	(350)	200	(180)	250	(170)	400
Sub-total (Liliriaja)	1,150	(620)	500	(450)	250	(170)	400
R - I b Marioriwawo	150	(80)	50	(50)	50	(30)	50
Total (R - I)	1,300	(700)	550	(500)	300	(200)	450
Total (Right B. Walanae)	7,300	(4,300)	3,250	(2,900)	2,250	(1,400)	1,800
Total (All Right Bank)	29,100	(20,100)	17,850	(16,100)	5,750	(4,000)	5,500

Table 15.8 (2) Irrigable Area in Walanae Irrigation Project (2/2)

(Unit : ha)

Irrigation Block/Kecamatan		Total Area		Present Land Use				
				Paddy Field		Upland Field		Non-Irr'ble Area
		Gross	(Net)	Gross	(Net)	Gross	(Net)	
Left Bank of the Walanae								
L - IV	Sabbangparu	1,900	(1,400)	1,250	(1,100)	400	(300)	250
L - III	Lilirilau	1,200	(660)	500	(460)	300	(200)	400
L - II	Liliriaja							
	Talumae Ex. 1/2-T. S.	380	(340)	380	(340)	0	(0)	50
	Akampen Ex. 1/2-T. S.	1,220	(1,100)	1,220	(1,100)	0	(0)	50
	Sub-total (L - III)	1,700	(1,440)	1,600	(1,440)	0	(0)	100
L - I a	Liliriaja							
	Lalenge Ex. 1/2-T. Sys.	900	(800)	900	(800)	0	(0)	0
	Lagarigi Ex. 1/2-T. S.	50	(50)	50	(50)	0	(0)	0
	Others	1,400	(450)	100	(100)	500	(350)	800
	Sub-total	2,350	(1,300)	1,050	(950)	500	(350)	800
L - I b	Liliriau							
	Lalenge Ex. 1/2-T. Sys.	220	(200)	220	(200)	0	(0)	0
	Lagarigi Ex. 1/2-T. S.	170	(150)	170	(150)	0	(0)	0
	Others	1,160	(650)	450	(400)	350	(250)	360
	Sub-total	1,550	(1,000)	840	(750)	350	(250)	360
L - I c	Marioriwawo	200	(100)	110	(100)	0	(0)	90
	Total (L - I)	4,100	(2,400)	2,000	(1,800)	850	(600)	1,250
Total (Left Bank)		8,900	(5,900)	5,350	(4,800)	1,550	(1,100)	2,000
Total		38,000	(26,000)	23,200	(20,900)	7,300	(5,100)	7,500
Kab. Bone	Duabocoe	5,200	(3,900)	3,350	(3,000)	1,550	(900)	700
	Exist. S			1,900	(1,700)			
	Others			1,450	(1,300)			
	Ajangale	8,200	(5,400)	4,850	(4,400)	1,400	(1,000)	1,950
Kab. Wajo	Pammana	8,400	(6,500)	6,400	(5,800)	950	(700)	1,050
	Exist. S			270	(240)			
	Others			6,130	(5,560)			
	Sabbangparu	4,100	(2,800)	2,400	(2,100)	1,000	(700)	700
Kab. Soppeng	Liliriau	6,550	(3,860)	2,890	(2,610)	2,000	(1,250)	1,660
	Exist. S			900	(810)			
	Others			1,990	(1,800)			
	Liliriaja	5,200	(3,360)	3,150	(2,840)	750	(520)	1,300
	Exist. S			2,850	(2,560)			
	Others			300	(280)			
	Marioriwawo	350	(180)	160	(150)	50	(30)	140

Table 15.9(1) Irrigable Area in Gilirang Irrigation Project
(Case 1: Intake Weir)

(Unit : ha)

Irrigation Block/Kecamatan		Total Area		Present Land Use				
				Paddy Field		Upland Field		Non-Irr'ble Area
		Gross	(Net)	Gross	(Net)	Gross	(Net)	
Right Bank								
R - 1	Maniangpajo	150	(90)	100	(90)	0	(0)	50
R - 2	"	100	(50)	60	(50)	0	(0)	40
R - 3	Majauleng	110	(100)	110	(100)	0	(0)	0
R - 4 a	"	540	(440)	490	(440)	0	(0)	0
R - 4 b	Sajoanging	1,000	(800)	900	(800)	0	(0)	100
	Sub-total	1,540	(1,240)	1,390	(1,240)	0	(0)	100
R - 5	Majauleng	400	(270)	300	(270)	0	(0)	100
R - 6	"	400	(270)	300	(270)	0	(0)	100
R - 7	Sajoanging	300	(180)	200	(180)	0	(0)	100
R - 8	"	800	(540)	600	(540)	0	(0)	200
R - 9	"	800	(450)	500	(450)	0	(0)	300
Total (Right Bank)		4,600	(3,190)	3,560	(3,190)	0	(0)	1,040
Left Bank								
L - 1	Maniangpajo	200	(110)	140	(110)	0	(0)	60
L - 2	Sajoanging	300	(180)	200	(180)	0	(0)	100
L - 3	"	600	(350)	400	(350)	0	(0)	200
L - 4	"	500	(270)	300	(270)	0	(0)	200
L - 5	"	1,000	(700)	800	(700)	0	(0)	200
Total (Left Bank)		2,600	(1,610)	1,840	(1,610)	0	(0)	760
Total		7,200	(4,800)	5,400	(4,800)	0	(0)	1,800
Kab. Wajo	Maniangpajo	450	(250)	300	(250)	0	(0)	150
	Majauleng	1,450	(1,080)	1,200	(1,080)	0	(0)	250
	Sajoanging	5,300	(3,470)	3,900	(3,470)	0	(0)	1,400

Table 15.9 (2) Irrigable Area in Gilirang Irrigation Project
(Case 2: Storage Dam)

(Unit : ha)

Irrigation Block/Kecamatan		Total Area		Present Land Use				
				Paddy Field		Upland Field		Non-Irr'ble Area
		Gross	(Net)	Gross	(Net)	Gross	(Net)	
Right Bank								
R - 1	Maniangpajo	800	(300)	400	(300)	0	(0)	400
R - 2	"	300	(150)	200	(150)	0	(0)	100
R - 3	Majauleng	600	(160)	180	(160)	0	(0)	420
R - 4 a	"	1,100	(840)	930	(840)	0	(0)	170
R - 4 b	Sajoanging	1,000	(800)	900	(800)	0	(0)	100
	Sub-total	2,100	(1,640)	1,830	(1,640)	0	(0)	270
R - 5	Majauleng	900	(500)	600	(500)	0	(0)	300
R - 6	"	450	(300)	350	(300)	0	(0)	100
R - 7	"	650	(400)	450	(400)	0	(0)	200
R - 8	Sajoanging	400	(250)	300	(250)	0	(0)	100
R - 9	"	1,600	(1,000)	1,100	(1,000)	0	(0)	500
R - 10	"	2,100	(1,500)	1,700	(1,500)	0	(0)	400
R - 11	"	1,100	(800)	900	(800)	0	(0)	200
Total	(Right Bank)	11,000	(7,000)	8,000	(7,000)	0	(0)	3,000
Left Bank								
L - 1	Maniangpajo	700	(400)	500	(400)	0	(0)	200
L - 2	Sajoanging	600	(300)	400	(300)	0	(0)	200
L - 3	"	1,300	(700)	800	(700)	0	(0)	500
L - 4	"	500	(250)	300	(250)	0	(0)	200
L - 5	"	600	(250)	300	(250)	0	(0)	300
L - 6	"	1,500	(1,100)	1,200	(1,100)	0	(0)	300
Total	(Left Bank)	5,200	(3,000)	3,500	(3,000)	0	(0)	1,700
Total		16,200	(10,000)	11,500	(10,000)	0	(0)	4,700
Kab. Wajo	Maniangpajo	1,800	(850)	1,100	(850)	0	(0)	700
	Majauleng	3,700	(2,200)	2,500	(2,200)	0	(0)	1,200
	Sajoanging	10,700	(6,950)	7,900	(6,950)	0	(0)	2,800

Table 15.10 Irrigable Area in Padangeng Irrigation Project

(Unit: ha)

Irrigation Block/Kecamatan	Total Area		Present Land Use				
			Paddy Field		Upland Field		Non-Irr'ble Area
	Gross	(Net)	Gross	(Net)	Gross	(Net)	
Right Bank							
R - 1 Lalabata	700	(460)	490	(440)	30	(20)	250
R - 2 "	440	(280)	310	(280)	0	(0)	130
R - 3 "							
Leworang Kn. Ex. 1/2-T.	790	(710)	790	(710)	0	(0)	0
Total (Right Bank)	2,000	(1,450)	1,590	(1,430)	30	(20)	380
Left Bank							
L - 1 Lalabata							
Leworang Kr. Ex.	1,320	(1,190)	1,320	(1,190)	0	(0)	0
Others	180	(50)	60	(50)	0	(0)	120
Sub-Total	1,500	(1,240)	1,380	(1,240)	0	(0)	120
L - 2 a Lalabata							
Towereng Ex. 1/2-T. Sys.	450	(400)	450	(400)	0	(0)	0
Others	330	(150)	110	(100)	70	(50)	150
Sub-Total	780	(550)	560	(500)	70	(50)	150
L - 2 b Marioriawa							
Towereng Ex. 1/2-T. Sys.	60	(50)	60	(50)	0	(0)	0
Total (L - 2)	840	(600)	620	(550)	70	(50)	150
L - 3 a Lalabata	170	(110)	120	(110)	0	(0)	50
L - 3 b Marioriawa	570	(450)	440	(400)	70	(50)	60
Total (L - 3)	740	(560)	560	(510)	70	(50)	110
L - 4 Marioriawa	420	(350)	390	(350)	0	(0)	30
Total (Left Bank)	3,500	(2,750)	2,950	(2,650)	140	(100)	410
Total	5,500	(4,200)	4,540	(4,080)	170	(120)	790
Kab. Soppeng Lalabata	4,450	(3,350)	3,650	(3,280)	100	(70)	700
Exist. sys.	2,560	(2,300)	2,560	(2,300)	0	(0)	0
Others	1,890	(1,050)	1,090	(980)	100	(70)	700
Marioriawa	1,050	(850)	890	(800)	70	(50)	90
Exist. sys.	60	(50)	60	(50)	0	(0)	0
Others	990	(800)	830	(750)	70	(50)	90

Table 15.11 (1) Irrigable Area in Cenranae Irrigation Project

(Case 1: Pump-up upto El.15.0 m)

(Unit : ha)

Irrigation Block/Kecamatan		Total Area		Present Land Use				Non-Irr'ble Area
				Paddy Field		Upland Field		
		Gross	(Net)	Gross	(Net)	Gross	(Net)	
I	Tempe	300	(90)	100	(90)	0	(0)	200
II - a	Tanasitolo	300	(270)	300	(270)	0	(0)	0
II - b	Majauleng	300	(270)	300	(270)	0	(0)	0
	Sub-total (II)	600	(540)	600	(540)	0	(0)	0
III - a	Majauleng	400	(350)	400	(350)	0	(0)	0
III - b	Tanasitolo	100	(90)	100	(90)	0	(0)	0
	Sub-total (III)	500	(440)	500	(440)	0	(0)	0
IV	Majauleng	400	(350)	400	(350)	0	(0)	0
V	"	500	(450)	500	(450)	0	(0)	0
VI	"	400	(270)	300	(270)	0	(0)	100
VII	Sajoanging	200	(70)	100	(70)	0	(0)	100
VIII	Takkalala	100	(90)	100	(90)	0	(0)	0
Total		3,000	(2,300)	2,600	(2,300)	0	(0)	400
Kab. Wajo	Tempe	300	(90)	100	(90)	0	(0)	200
	Tanasitolo	400	(360)	400	(360)	0	(0)	0
	Majauleng	2,000	(1,690)	1,900	(1,690)	0	(0)	100
	Sajoanging	200	(70)	100	(70)	0	(0)	100
	Takkalala	100	(90)	100	(90)	0	(0)	0

Table 15.11 (2) Irrigable Area in Cenranae Irrigation Project

(Case 2 Pump-up upto El. 30 m)

(Unit: ha)

Irrigation	Block/Kecamatan	Total Area		Present Land Use				
				Paddy Field		Upland Field		Non-Irr'ble Area
		Gross	(Net)	Gross	(Net)	Gross	(Net)	
I	Tempe	500	(90)	100	(90)	0	(0)	400
II - a	Tanasitolo	1,000	(810)	900	(810)	0	(0)	100
II - b	Majauleng	400	(270)	300	(270)	0	(0)	100
	Sub-total (II)	1,400	(1,080)	1,200	(1,080)	0	(0)	200
III - a	Majauleng	200	(90)	100	(90)	0	(0)	100
III - b	Tanasitolo	450	(360)	400	(360)	0	(0)	50
	Sub-total (III)	650	(450)	500	(450)	0	(0)	150
IV - a	Majauleng	500	(360)	400	(360)	0	(0)	100
IV - b	Tanasitolo	150	(80)	100	(80)	0	(0)	50
	Sub-total (IV)	650	(440)	500	(440)	0	(0)	150
V	Majauleng	400	(320)	360	(320)	0	(0)	40
VI	"	500	(400)	440	(400)	0	(0)	60
VII	"	900	(810)	900	(810)	0	(0)	0
VIII	"	550	(410)	450	(410)	0	(0)	100
IX	Sajoanging	700	(530)	550	(500)	40	(30)	110
X - a	Takkalala	600	(430)	450	(410)	40	(20)	110
X - b	"	450	(320)	350	(320)	0	(0)	100
X - c	"	300	(260)	300	(260)	0	(0)	0
X - d	"	950	(730)	750	(680)	70	(50)	130
X - e	"	350	(230)	250	(230)	0	(0)	100
	Sub-total (X)	2,650	(1,970)	2,100	(1,900)	110	(70)	440
Total		8,900	(6,500)	7,100	(6,400)	150	(100)	1,650
Kab. Wajo	Tempe	500	(90)	100	(90)	0	(0)	400
	Tanasitolo	1,600	(1,250)	1,400	(1,250)	0	(0)	200
	Majauleng	3,450	(2,660)	2,950	(2,660)	0	(0)	500
	Sajoanging	700	(530)	550	(500)	40	(30)	110
	Takkalala	2,650	(1,970)	2,100	(1,900)	110	(70)	440

Table 15.12 Irrigable Area of Proposed Irrigation Projects
(By Each Kecamatan and Present Land Use)

Unit: ha

Project/ Kabupaten/ Kecamatan	Present Land Use: Irrigated Paddy Field Tech. Syst.	Irrigated Paddy Field ½-T. Syst.	Irrigated Paddy Field Total	Rainfed Paddy	Total Paddy Field	Upland Field	Total Irrigable Area
Langkemme Project							
Soppeng Marioriwawo	0	220	220	680	900	0	900
- do - Liliriaja	0	0	0	2,600	2,600	0	2,600
- do - Lalabata	0	0	0	1,500	1,500	0	1,500
Total	0	220	220	4,780	5,000	0	5,000
Bila Project							
Sidrap Dua Pitue	0	0	0	3,960	3,960	100	4,060
Wajo Maniangpajo	0	520	520	2,980	3,500	50	3,550
- do - Belawa	0	0	0	1,400	1,400	50	1,450
- do - Tanasitolo	0	0	0	1,440	1,440	0	1,440
Sub-total	0	520	520	5,820	6,340	100	6,440
Total	0	520	520	9,780	10,300	200	10,500
Sanrego Project							
Bone Kahu	0	430	430	4,880	5,310	390	5,700
- do - Salomekko	0	0	0	200	200	0	200
- do - Tonra	0	0	0	350	350	50	400
Sub-total	0	430	430	5,430	5,860	440	6,300
- do - Libureng	0	0	0	2,240	2,240	1,460	3,700
Total	0	430	430	7,670	8,100	1,900	10,000
Lawo Project							
Soppeng Lalabata	0	500	500	1,300	1,800	0	1,800
- do - Liliriaja	0	0	0	1,200	1,200	0	1,200
Total	0	500	500	2,500	3,000	0	3,000
Boya Project							
Sidrap Dua Pitue	6,260	290	6,550	1,220	7,770	0	7,770
Wajo Belawa	0	1,630	1,630	600	2,230	0	2,230
Total	6,260	1,920	8,180	1,820	10,000	0	10,000
Gilirang Project							
Wajo Maniangpajo	0	0	0	250	250	0	250
- do - Majauleng	0	0	0	1,080	1,080	0	1,080
- do - Sajoanging	0	0	0	3,470	3,470	0	3,470
Total	0	0	0	4,800	4,800	0	4,800
Walanae Project							
Soppeng Marioriwawo	0	0	0	150	150	30	180
- do - Liliriaja	0	2,560	2,560	280	2,840	520	3,360
- do - Lilirilau	0	810	810	1,800	2,610	1,250	3,860
Sub-total	0	3,370	3,370	2,230	5,600	1,800	7,400
Wajo Sabbangparu	0	0	0	2,100	2,100	700	2,800
- do - Pammana	0	240	240	5,560	5,800	700	6,500
Sub-total	0	240	240	7,660	7,900	1,400	9,300
Bone Ajangale	0	0	0	4,400	4,400	1,000	5,400
- do - Dua Bocoe	0	1,700	1,700	1,300	3,000	900	3,900
Sub-total	0	1,700	1,700	5,700	7,400	1,900	9,300
Total	0	5,310	5,310	15,590	20,900	5,100	26,000
Padargeng Project							
Soppeng Marioriawa	0	50	50	750	800	50	850
- do - Lalabata	0	2,300	2,300	980	3,280	70	3,350
Total	0	2,350	2,350	1,730	4,080	120	4,200
Cenranae Project							
Wajo Tempe	0	0	0	90	90	0	90
- do - Tanasitolo	0	0	0	360	360	0	360
- do - Majauleng	0	0	0	1,690	1,690	0	1,690
- do - Sajoanging	0	0	0	70	70	0	70
- do - Takkalalla	0	0	0	90	90	0	90
Total	0	0	0	2,300	2,300	0	2,300

Note: Village irrigation systems are included in rainfed paddy field.

Table 15.13 Water Requirement and Irrigable Area with Surface Runoff of the Langkemme River

	Wet Season Paddy						Dry Season Paddy					
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.
1973/74												
Q	-	-	-	-	-	-	-	-	-	-	-	-
R	-	0.06	0.01	0.03	0	0.11	0	0.20	0	0.32	0.54	0.40
Q/R	-	-	-	-	-	-	-	-	-	-	-	-
A	-	-	-	-	-	-	-	-	-	-	-	-
1974/75												
Q	-	-	3.1	4.3	4.0	2.6	2.3	4.4	2.9	5.2	4.9	5.0
R	0.01	0.39	0.36	0.35	0.29	0.15	0	0.09	0.79	0.91	1.15	0.60
Q/R	NL	-	8.6	12.3	13.8	17.3	NL	48.9	3.6	5.7	4.3	8.3
A	5,000						3,600					
1975/76												
Q	4.6	5.5	3.7	1.6	2.5	2.6	2.3	1.5	1.9	5.7	5.0	2.0
R	0.03	0.27	0	0.31	0.28	0.14	0	0.16	0.68	0.68	1.09	0.64
Q/R	NL	20.4	NL	5.2	8.9	18.6	NL	9.4	2.8	8.4	4.6	3.1
A	5,000						2,800					
1976/77												
Q	2.1	2.9	2.4	3.4	4.0	2.5	1.4	3.1	2.7	5.1	12.7	14.7
R	0.03	0.30	0.28	0.18	0.42	0.19	0	0.17	0.48	0.69	0.23	0.45
Q/R	NL	9.7	8.6	18.9	9.5	13.2	NL	18.2	5.6	7.4	55.2	32.7
A	5,000						5,000					
1977/78												
Q	7.5	8.0	6.0	7.1	4.6	3.1	2.1	2.7	2.4	6.0	5.2	4.2
R	0.03	0.32	0.52	0	0.72	0.19	0	0.27	0.68	0.34	1.00	0.60
Q/R	NL	25.0	11.5	NL	6.4	16.3	NL	10.4	3.5	17.6	5.2	7.0
A	5,000						3,500					
Average Area	5,000 ha						3,700 ha					

Note: Q : Monthly mean discharge in m^3/sec (See Table 6.9)

R : Gross irrigation water requirement in lit/sec/ha (See Table 15.2)

Q/R: Irrigable area in 1,000 ha

A : Irrigation area through growing season in ha

NL : Not limited (irrigable over 100,000 ha)

- : Not available

Table 15.14 Irrigable Area and Required Storage Capacity for Alternative Plans of Bila Irrigation Project

Item		Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
		1973/74											
1. Mean monthly discharge	(m^3/s)	34.0	45.2	26.6	50.7	28.2	36.1	19.5	14.6	28.1	7.7	8.8	3.7
2. Unit water requirement	(l/s/ha)	0.03	0.39	0	0.84	0	0	0.15	0.26	0.78	1.17	0.59	0
3. Diversion requirement, Case-3	(m^3/s)	0.4	4.9	0	10.1	0	0	1.8	3.1	9.4	14.0	7.1	0
4. Available discharge, Site-A	(m^3/s)	34.0	45.2	26.6	50.7	28.2	36.1	19.5	14.6	28.1	7.7	8.8	3.7
5. " " , Site-B	(m^3/s)	25.7	34.2	20.1	38.4	21.3	27.3	14.8	11.1	21.3	5.8	6.7	2.8
6. Irrigable area, Case-1 (Monthly)	(1,000 ha)	NL	116	NL	60.4	NL	NL	130	56.2	36.0	6.6	14.9	NL
7. " " " (Seasonal)	(ha)	----------		10,500	----------			----------		6,600	----------		
8. Irrigable area, Case-2 (Monthly)	(1,000 ha)	NL	87.7	NL	45.7	NL	NL	98.7	42.7	27.3	5.0	11.4	NL
9. " " " (Seasonal)	(ha)	----------		10,000	----------			----------		5,000	----------		
10. Water deficit of Case-3 dam plan	(m^3/s)										8.8	0.8	-1.2
11. Accumulated deficit	(m^3/s)										8.8	9.6	8.4

Item		Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
		1974/75											
1. Mean monthly discharge	(m^3/s)	15.1	18.5	16.8	31.9	12.2	54.2	28.2	18.3	13.1	9.8	28.7	23.3
2. Unit water requirement	(l/s/ha)	0.11	0.28	0.46	0.53	0.63	0	0.14	0.77	1.01	1.31	0.55	0
3. Diversion requirement, Case-3	(m^3/s)	1.3	3.4	5.5	6.4	7.8	0	1.7	9.2	12.1	15.7	6.6	0
4. Available discharge, Site-A	(m^3/s)	15.1	18.5	16.8	31.9	12.2	54.2	28.2	18.3	13.1	9.8	28.7	23.3
5. " " , Site-B	(m^3/s)	11.4	14.0	12.7	24.2	9.2	41.0	21.3	13.9	9.9	7.4	21.7	17.6
6. Irrigable area, Case-1 (Monthly)	(1,000 ha)	137	66.1	36.5	60.2	18.8	NL	201	23.8	13.0	7.5	52.2	NL
7. " " " (Seasonal)	(ha)	----------		10,500	----------			----------		7,500	----------		
8. Irrigable area, Case-2 (Monthly)	(1,000 ha)	104	50.0	27.6	45.7	14.6	NL	152	18.1	9.8	5.6	39.5	NL
9. " " " (Seasonal)	(ha)	----------		10,000	----------			----------		5,600	----------		
10. Water deficit of Case-3 dam plan	(m^3/s)	-11.3									1.5	8.4	-19.6
11. Accumulated deficit	(m^3/s)	0									1.5	9.9	0

Item		Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
		1975/76											
1. Mean monthly discharge	(m^3/s)	10.1	33.7	25.4	36.1	33.3	47.2	28.9	14.8	11.0	5.6	3.5	10.0
2. Unit water requirement	(l/s/ha)	0.14	0	0.06	0.53	0.20	0	0.09	0.93	1.03	1.16	0.64	0
3. Diversion requirement, Case-3	(m^3/s)	1.7	0	0.7	6.4	2.4	0	1.1	11.2	12.4	13.9	7.7	0
4. Available discharge, Site-A	(m^3/s)	10.1	33.7	25.4	36.1	33.3	47.2	28.9	14.8	11.0	5.6	3.5	10.0
5. " " , Site-B	(m^3/s)	7.6	25.5	19.2	27.3	25.2	35.7	21.9	11.2	8.3	4.2	2.7	7.6
6. Irrigable area, Case-1 (Monthly)	(1,000 ha)	72.1	NL	42.3	68.1	166	NL	321	15.9	10.7	4.8	5.5	NL
7. " " " (Seasonal)	(ha)	----------		10,500	----------			----------		4,800	----------		
8. Irrigable area, Case-2 (Monthly)	(1,000 ha)	54.3	NL	320	51.5	126	NL	243	12.0	8.1	3.6	4.2	NL
9. " " " (Seasonal)	(ha)	----------		10,000	----------			----------		3,600	----------		
10. Water deficit of Case-3 dam plan	(m^3/s)									3.9	10.8	6.7	-7.5
11. Accumulated deficit	(m^3/s)									3.9	14.7	21.4	13.9

Item		Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
		1976/77											
1. Mean monthly discharge	(m^3/s)	7.8	21.6	14.5	10.9	11.8	2.9	4.9	11.5	9.5	9.2	13.2	7.7
2. Unit water requirement	(l/s/ha)	0.14	0.56	0	0.43	0.48	0	0.17	0.54	1.05	1.02	0.60	0
3. Diversion requirement, Case-3	(m^3/s)	1.7	6.7	0	5.2	5.8	0	2.0	6.5	12.6	12.2	7.2	0
4. Available discharge, Site-A	(m^3/s)	7.8	21.6	14.5	10.9	11.8	2.9	4.9	11.5	9.5	9.2	13.2	7.7
5. " " , Site-B	(m^3/s)	5.9	16.4	11.0	8.3	8.9	2.2	3.7	8.7	7.2	7.0	10.0	5.8
6. Irrigable area, Case-1 (Monthly)	(1,000 ha)	55.7	38.6	NL	25.3	24.6	NL	28.8	21.3	9.0	9.0	22.0	NL
7. " " " (Seasonal)	(ha)	----------		10,500	----------			----------		9,000	----------		
8. Irrigable area, Case-2 (Monthly)	(1,000 ha)	42.1	29.3	NL	19.3	18.5	NL	21.8	16.1	6.9	6.9	16.7	NL
9. " " " (Seasonal)	(ha)	----------		10,000	----------			----------		6,900	----------		
10. Water deficit of Case-3 dam plan	(m^3/s)	-3.6	-12.4							5.6	5.5	-3.5	-5.2
11. Accumulated deficit	(m^3/s)	10.3	0							5.6	11.1	7.6	2.4

Item		Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
		1977/78											
1. Mean monthly discharge	(m^3/s)	29.5	17.2	25.8	10.6	17.2	2.5	2.4	2.5	31.0	18.3	11.7	
2. Unit water requirement	(l/s/ha)	0.13	0.38	0	0.84	0.54	0	0.25	0.40	0.94	0.66	0.65	
3. Diversion requirement, Case-3	(m^3/s)	1.6	4.6	0	10.1	6.5	0	3.0	4.8	11.3	7.9	7.8	
4. Available discharge, Site-A	(m^3/s)	29.5	17.2	25.8	10.6	17.2	2.5	2.4	2.5	31.0	18.3	11.7	
5. " " , Site-B	(m^3/s)	22.3	13.0	19.5	8.0	13.0	1.9	1.8	1.9	23.5	13.9	8.9	
6. Irrigable area, Case-1 (Monthly)	(1,000 ha)	227	45.3	NL	12.6	31.9	NL	9.6	6.3	33.0	27.7	18.0	
7. " " " (Seasonal)	(ha)	----------		10,500	----------			--------		6,300	--------		
8. Irrigable area, Case-2 (Monthly)	(1,000 ha)	172	34.2	NL	9.5	24.1	NL	7.2	4.8	25.0	21.1	13.7	
9. " " " (Seasonal)	(ha)	----------		9,500	----------			--------		4,800	--------		
10. Water deficit of Case-3 dam plan	(m^3/s)	-25.4			2.0	-8.2		3.1	4.8	-17.2			
11. Accumulated deficit	(m^3/s)	0			2.0	0		3.1	7.9	0			

Note: /1 Monthly mean discharge at gauging station with catchment area of 379 km^2.

/2 Project area, Case-1: 10,500 ha
Case-2: 10,000 ha
Case-3: 12,000 ha

/3 Catchment area, Site-A: 376 km^2
Site-B: 287 km^2

/4 Water deficit, item 10 is based on river maintenance flow of 2.5 m^3/s
(10) = (3) + 2.5 - (4)

/5 Storage Capacity required for Case-3 dam plan is 62×10^6 m^3

Table 15.15 Water Requirement and Irrigable Area with Surface Runoff of the Sanrego River

	Wet Season Paddy						Dry Season Paddy					
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.
1973/74												
Q	(8.8)	9.9	8.9	(11.9)	(8.4)	(9.1)	8.8	7.2	10.2	10.7	11.4	10.3
R	0.02	0.21	0.11	0	0	0.04	0	0.42	0.79	0.76	0.81	0.09
Q/R	NL	47.1	80.9	NL	NL	NL	NL	17.1	12.9	14.1	14.1	NL
A	10,000						10,000					
1974/75												
Q	(8.8)	11.3	7.9	8.8	10.7	8.3	9.1	7.4	7.1	6.8	7.9	(8.8)
R	0.02	0.32	0.18	0	0	0.15	0	0.15	0.82	0.97	0.50	0.16
Q/R	NL	35.3	43.9	NL	NL	55.3	NL	49.3	8.7	7.0	15.8	55.0
A	10,000						7,000					
1975/76												
Q	8.0	9.2	14.6	12.4	9.5	14.6	15.5	9.2	10.5	10.7	8.7	(8.8)
R	0.03	0.32	0	0	0	0	0	0.20	0.79	0.72	0.58	0.15
Q/R	NL	28.8	NL	NL	NL	NL	NL	46.0	13.3	14.9	15.0	58.7
A	10,000						10,000					
1976/77												
Q	(8.8)	8.5	9.1	9.3	7.6	5.9	5.4	5.6	5.4	7.2	10.3	8.9
R	0.02	0	0	0	0.41	0.17	0	0.60	0.64	0.16	0.62	0.16
Q/R	NL	NL	NL	NL	18.5	34.7	NL	9.3	8.4	45.0	16.6	55.6
A	10,000						8,400					
1977/78												
Q	10.4	8.7	7.0	20.8	6.3	(9.1)	7.8	(7.4)	(8.0)	8.9	8.7	7.1
R	0.03	0.23	0.36	0	0.66	0.17	0.05	0.64	1.04	0	0.59	0.15
Q/R	NL	37.8	19.4	NL	9.5	53.5	NL	11.6	7.7	NL	14.7	47.3
A	9,500						7,800					
Average Area	9,900						8,600					

Note: Q : Monthly mean discharge in m^3/sec (See Table 6.9)

R : Gross irrigation water requirement in lit/sec/ha (See Table 15.2)

Q/R: Irrigable area in 1,000 ha

A : Irrigation area through growing season in ha

NL : Not limited (Irrigable over 100,000 ha)

- : Not available

Table 15.16 Water Requirement and Irrigable Area with Surface Runoff of the Lawo River

	Wet Season Paddy						Dry Season Paddy					
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.
1973/74												
Q	-	-	-	-	-	-	-	-	-	-	-	-
R	-	0	0	0	0	0	0	0.05	0.11	0.72	0.31	0.62
Q/R	-	NL	NL	NL	NL	NL	NL	-	-	-	-	-
A				-						-		
1974/75												
Q	-	-	1.9	2.6	2.4	1.5	1.3	2.6	1.7	3.1	2.9	3.0
R	0.02	0.50	0.36	0.68	0.32	0	0	0.01	0.73	0.86	1.15	0.97
Q/R	-	-	5.3	3.8	7.5	NL	NL	NL	2.3	3.6	2.5	3.1
A				3,000						2,300		
1975/76												
Q	2.8	3.4	2.2	0.9	2.2	1.3	2.0	1.2	0.9	4.5	3.5	2.5
R	0.05	0.35	0.15	0.29	0.10	0	0	0	0.72	0.55	1.14	0.91
Q/R	54.0	9.7	14.7	3.1	22.0	NL	NL	NL	1.3	8.2	3.1	2.7
A				3,000						1,300		
1976/77												
Q	2.0	1.7	1.7	2.2	1.1	0.2	2.2	0.7	1.3	4.0	7.9	9.2
R	0.05	0.47	0.16	0.40	0.31	0	0	0.05	0.29	0.72	0.43	0.69
Q/R	40.0	3.6	10.6	5.5	3.5	NL	NL	23.3	4.5	5.6	18.4	13.3
A				3,000						3,000		
1977/78												
Q	4.6	5.4	3.6	10.3	2.3	1.1	0.6	0.3	0.5	3.2	6.0	3.8
R	0.05	0.32	0.50	0	0.64	0	0	0.07	0.73	0.40	1.02	0.91
Q/R	92.0	16.9	7.2	NL	3.6	NL	NL	4.3	0.7	8.0	5.9	4.2
A				3,000						700		
Average Area				3,000						1,800		

Note: Q : Monthly mean discharge in m^3/sec (See Table 6.9)

R : Gross irrigation water requirement in lit/sec/ha (See Table 15.2)

Q/R: Irrigable area in 1,000 ha

A : Irrigation area through growing season in ha

NL : Not limited (irrigable over 100,000 ha)

- : Not available

Table 15.17 Water Requirement and Irrigable Area with Surface Runoff of the Boya River

	Wet Season Paddy						Dry Season Paddy					
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1973/74												
Q	46.1	61.3	36.1	68.8	38.2	49.0	26.4	19.8	38.1	10.4	11.9	5.0
R	0	0.29	0	0.81	0	0.05	0.02	0.20	0.72	1.14	1.04	0.18
Q/R	NL	NL	NL	84.9	NL	NL	NL	99.0	52.9	9.1	11.4	27.8
A			10,000						9,100			
1974/75												
Q	20.5	25.1	22.8	43.3	16.5	73.5	38.2	24.8	17.8	13.3	38.9	31.6
R	0.01	0.22	0.42	0.49	1.12	0	0.02	0.51	0.95	1.28	0.96	0.19
Q/R	NL	NL	54.3	88.4	14.7	NL	NL	48.6	18.7	10.4	40.5	NL
A			10,000						10,000			
1975/76												
Q	13.7	45.7	34.4	49.0	45.2	64.0	17.8	11.3	20.0	18.1	17.2	33.4
R	0.02	0	0.02	0.49	0.39	0	0.01	0.61	0.97	1.13	1.12	0.10
Q/R	NL	NL	NL	100	NL	NL	NL	18.5	20.6	16.0	15.4	NL
A			10,000						10,000			
1976/77												
Q	27.6	32.3	27.8	32.2	13.4	6.8	4.8	13.5	15.9	15.4	16.7	26.0
R	0.02	0.40	0	0.40	0.85	0.23	0.02	0.37	0.99	0.99	1.06	0.17
Q/R	NL	80.8	NL	80.5	15.8	29.6	NL	36.5	16.1	15.6	15.8	NL
A			10,000						10,000			
1977/78												
Q	39.3	16.2	21.4	7.9	20.5	2.6	0.5	7.6	23.5	28.3	17.0	29.3
R	0.01	0.28	0	0.81	0.96	0.23	0.05	0.29	0.88	0.63	1.14	0.07
Q/R	NL	57.9	NL	9.8	21.4	11.3	10.0	26.2	26.7	44.9	14.9	NL
A			9,800						10,000			
Average Area			10,000 ha						9,800 ha			

Note: Q : Monthly mean discharge in m^3/sec (See Table 6.9)

R : Gross irrigation water requirement in lit/sec/ha (See Table 15.2)

Q/R: Irrigable area in 10,000 ha

A : Irrigation area through growing season in ha

NL : Not limited (irrigable over 100,000 ha)

Table 15.18 Diversion Water Requirement for Walanae Irrigation Project

Item			Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.
			1973/74											
1. Walanae river area														
(1) Unit water requirement		(ℓ/s/ha)	0.06	0	0.03	0	0.11	0	0.20	0	0.32	0.54	0.40	
(2) Left bank area	5,900 ha	(m^3/s)	0.4	0	0.2	0	0.6	0	1.2	0	1.9	3.2	2.4	
(3) Right bank area	4,300 ha	(m^3/s)	0.3	0	0.1	0	0.5	0	0.9	0	1.4	2.3	1.7	
2. Cenranae river area														
(1) Unit water requirement		(ℓ/s/ha)	0.22	0.09	0	0	0.31	0	0.16	0.08	1.10	1.42	0.72	
(2) Cenranae area	15,800 ha	(m^3/s)	3.5	1.4	0	0	4.9	0	2.5	1.3	17.4	22.4	11.4	
3. Total right bank	20,100 ha	(m^3/s)	3.8	1.4	0.1	0	5.4	0	3.4	1.3	18.8	24.7	13.1	
4. Total Walanae project	26,000 ha	(m^3/s)	4.2	1.4	0.3	0	6.0	0	4.6	1.3	20.7	27.9	15.5	
			1974/75											
1. Walanae river area														
(1) Unit water requirement		(ℓ/s/ha)	0.01	0.39	0.36	0.35	0.29	0.15	0	0.09	0.78	0.91	1.15	0.60
(2) Left bank area	5,900 ha	(m^3/s)	0.1	2.3	2.1	2.1	1.7	0.9	0	0.5	4.6	5.4	6.8	3.5
(3) Right bank area	4,300 ha	(m^3/s)	0	1.7	1.5	1.5	1.2	0.6	0	0.4	3.4	3.9	4.9	2.5
2. Cenranae river area														
(1) Unit water requirement		(ℓ/s/ha)	0	0.27	0.81	0.40	0.21	0.55	0	0.16	0.68	1.11	1.37	0.62
(2) Cenranae area	15,800 ha	(m^3/s)	0	4.3	12.8	6.3	3.3	8.7	0	2.5	10.7	17.5	21.6	9.8
3. Total right bank	20,100 ha	(m^3/s)	0	6.0	14.3	7.8	4.5	9.3	0	2.9	14.1	21.4	26.5	12.3
4. Total Walanae project	26,000 ha	(m^3/s)	0.1	8.3	16.4	9.9	6.2	10.2	0	3.4	18.7	26.8	33.3	15.8
			1975/76											
1. Walanae river area														
(1) Unit water requirement		(ℓ/s/ha)	0.02	0.27	0	0.31	0.28	0.14	0	0.16	0.68	0.68	1.09	0.64
(2) Left bank area	5,900 ha	(m^3/s)	0.1	1.6	0	1.8	1.7	0.8	0	0.9	4.0	4.0	6.4	3.8
(3) Right bank area	4,300 ha	(m^3/s)	0.1	1.2	0	1.3	1.2	0.6	0	0.7	2.9	2.9	4.7	2.8
2. Cenranae area														
(1) Unit water requirement		(ℓ/s/ha)	0	0.19	0.63	0.31	0.95	0.42	0	0.19	0.84	1.07	1.28	0.68
(2) Cenranae area	15,800 ha	(m^3/s)	0	3.0	10.0	4.9	15.0	6.6	0	3.0	13.3	16.9	20.2	10.7
3. Total right bank	20,100 ha	(m^3/s)	0.1	4.2	10.0	6.2	16.2	7.2	0	3.7	16.2	19.8	24.9	13.5
4. Total Walanae project	26,000 ha	(m^3/s)	0.2	5.8	10.0	8.0	17.9	8.0	0	4.6	20.2	23.8	31.3	17.3
			1976/77											
1. Walanae river area														
(1) Unit water requirement		(ℓ/s/ha)	0.02	0.30	0.28	0.18	0.42	0.19	0	0.17	0.50	0.69	0.23	0.45
(2) Left bank area	5,900 ha	(m^3/s)	0.1	1.8	1.7	1.1	2.5	1.1	0	1.0	3.0	4.1	1.4	2.7
(3) Right bank area	4,300 ha	(m^3/s)	0.1	1.3	1.2	0.8	1.8	0.8	0	0.7	2.2	3.0	1.0	1.9
2. Cenranae area														
(1) Unit water requirement		(ℓ/s/ha)	0	0.17	0.27	0.05	0	0.57	0	0.20	0.58	1.01	1.06	0.59
(2) Cenranae area	15,800 ha	(m^3/s)	0	2.7	4.3	0.8	0	9.0	0	3.2	9.2	16.0	16.7	9.3
3. Total right bank	20,100 ha	(m^3/s)	0	4.0	5.5	1.6	1.8	9.8	0	3.9	11.3	19.0	17.7	11.2
4. Total Walanae project	26,000 ha	(m^3/s)	0	5.8	7.2	2.7	4.3	10.9	0	4.9	14.1	23.1	19.1	13.9
			1977/78											
1. Walanae river area														
(1) Unit water requirement		(ℓ/s/ha)	0.02	0.32	0.52	0	0.72	0.19	0	0.27	0.68	0.34	1.00	0.60
(2) Left bank area	5,900 ha	(m^3/s)	0.1	1.9	3.1	0	4.2	1.1	0	1.6	4.0	2.0	5.9	3.5
(3) Right bank area	4,300 ha	(m^3/s)	0.1	1.4	2.2	0	3.1	0.8	0	1.2	2.9	1.5	4.3	2.6
2. Cenranae area														
(1) Unit water requirement		(ℓ/s/ha)	0	0.12	0.58	0	0.83	0.52	0	0.27	0.74	0.97	1.04	0.63
(2) Cenranae area	15,800 ha	(m^3/s)	0	1.9	9.2	0	13.1	8.2	0	4.3	11.7	15.3	16.3	10.0
3. Total right bank	20,100 ha	(m^3/s)	0.1	3.3	11.4	0	16.2	9.0	0	5.5	14.6	16.8	20.7	12.6
4. Total Walanae project	26,000 ha	(m^3/s)	0.2	5.2	14.5	0	20.4	10.1	0	7.1	18.6	18.8	26.6	16.1

Table 15.19 (1) Required Storage Capacity for Irrigation at Mong Damsite

Year	Month	(1) Qo (m^3/s)	(2) Qs (m^3/s)	(3) Qu (l/s/ha)	(4) Ia (ha)	(5) Qd (m^3/s)	(6) Qa (m^3/s)	(7) R (m^3/s)	(8) D (m^3/s)	(9) Ad (m^3/s)
1974	Apr.	38.3	3.2	0.01	5,000	0.1	35.0	8.3	-	-
	May	84.8	1.8	0.39	"	2.0	81.0	16.4	-	-
	Jun.	94.5	0	0.36	"	1.8	92.7	9.9	-	-
	Jul.	102.6	0	0.29	"	1.5	101.1	6.2	-	-
	Aug.	50.9	1.5	0.15	"	0.8	48.6	10.2	-	-
	Sep.	88.1	0.1	0	"	0	88.0	0	-	-
	Oct.	68.3	1.3	0.09	"	0.5	66.5	3.4	-	0
	Nov.	37.6	5.7	0.78	3,700	2.9	24.0	18.7	4.7	4.7
	Dec.	63.9	6.8	0.91	"	3.4	53.7	26.8	-11.9	-
1975	Jan.	114.2	3.5	1.15	3,700	4.3	106.4	33.3	-	-
	Feb.	131.6	1.1	0.60	"	2.2	128.3	15.8	-	-
	Mar.	78.7	0.2	0.02	5,000	0.1	78.4	0.2	-	-
	Apr.	144.6	3.2	0.27	"	1.4	140.0	5.8	-	-
	May	317.3	0	0	"	0	317.3	10.0	-	-
	Jun.	205.1	0	0.31	"	1.6	110.6	8.0	-	-
	Jul.	198.9	0	0.28	"	2.4	196.5	17.9	-	-
	Aug.	123.0	0	0.14	"	0.7	122.3	8.0	-	-
	Sep.	79.5	0.1	0	"	0	79.5	0	-	-
	Oct.	89.5	2.0	0.16	"	0.8	86.7	4.6	-	-
	Nov.	111.4	7.9	0.68	2,800	1.9	101.6	20.2	-	-
	Dec.	(72.5)	7.2	0.68	"	1.9	63.4	23.8	-	-
1976	Jan.	(174.0)	5.8	1.09	2,800	3.1	165.1	31.3	-	-
	Feb.	85.5	1.5	0.64	"	1.8	82.5	17.3	-	-
	Mar.	82.5	0.1	0.02	5,000	0.1	82.3	0	-	-
	Apr.	57.8	0	0.30	"	1.5	56.3	5.8	-	-
	May	114.9	0	0.28	"	1.4	113.5	7.2	-	-
	Jun.	113.4	0	0.18	"	0.9	112.5	2.7	-	-
	Jul.	72.4	4.1	0.42	"	2.1	66.2	4.3	-	0
	Aug.	25.2	1.7	0.19	"	1.0	22.5	10.9	3.4	3.4
	Sep.	12.4	0.2	0	"	0	12.2	0	2.8	6.2
	Oct.	13.2	5.6	0.17	"	0.9	6.7	4.9	13.2	19.4
	Nov.	20.2	5.4	0.48	"	2.4	12.4	14.1	17.0	36.4
	Dec.	60.2	1.4	0.69	"	3.5	55.3	23.1	-17.2	19.2
1977	Jan.	289.6	5.4	0.23	5,000	1.2	283.0	19.1	-248.9	-
	Feb.	361.8	1.4	0.45	"	2.3	358.1	13.9	-	-
	Mar.	151.9	0.2	0.02	"	0.1	151.6	0.2	-	-
	Apr.	108.2	2.3	0.32	"	1.6	104.3	5.2	-	0
	May	34.3	3.6	0.52	"	2.6	28.1	14.5	1.4	1.4
	Jun.	366.4	0	0	"	0	366.0	0	-351.0	-
	Jul.	48.3	6.3	0.72	"	3.6	38.4	20.4	-	-
	Aug.	32.2	1.6	0.19	"	1.0	29.6	10.1	-	-
	Sep.	18.4	0.2	0	"	0	18.2	0	-	0
	Oct.	14.2	6.4	0.27	"	1.4	6.4	7.1	15.7	15.7
	Nov.	18.2	8.6	0.68	3,500	2.4	7.2	18.6	26.4	42.1
	Dec.	36.8	0	0.34	"	1.2	35.6	18.8	-1.8	40.3
1978	Jan.	118.3	4.8	1.00	3,500	3.5	110.0	26.6	-69.9	-
	Feb.	69.1	1.2	0.60	"	2.1	65.8	16.1	-	-

Note:

/1: Abbreviation

- Qo : Mean monthly discharge at Mong damsite
- Qs : Diversion requirement of Sanrego project
  See Table 15.19 (2)
- Qu : Unit water requirement of Langkemme project
- Ia : Irrigation area of Langkemme project
- Qd : Diversion requirement of Langkemme project
  Qu x Ia
- Qa : Available discharge at Mong damsite
  Qo - (Qs + Qd)
- R : Required discharge of Walanae project 26,000 ha
- D : Deficit of mean monthly discharge
  R + 15.0 - Qa
- Ad : Accumulated discharge

/2: River maintenance flow : 15.0 m^3/s

/3: Total required storage capacity

(i) Irrigation and river maintenance flow requirement
$40.3 \times 86,400 \times 30 = 105 \times 10^6\ m^3$

(ii) Evaporation loss from reservoir water surface
$0.711\ m \times 31 \times 10^6\ m^2 \times 0.75$
$= 17 \times 10^6\ m^3$

Total	$122 \times 10^6\ m^3$

Table 15.19 (2) Required Storage Capacity for Irrigation at Walimpong Damsite

Year	Month	(1) Qo (m^3/s)	(2) Qu (ℓ/s/ha)	(3) Ia (ha)	(4) Qs (m^3/s)	(5) Qa (m^3/s)	(6) R (m^3/s)	(7) D (m^3/s)	(8) Ad (m^3/s)
1974	Apr.	31.4	0.32	10,000	3.2	28.2	8.3	-	-
	May	69.5	0.18	"	1.8	67.7	16.4	-	-
	Jun.	77.4	0	"	0	77.4	9.9	-	-
	Jul.	84.1	0	"	0	84.1	6.2	-	-
	Aug.	41.7	0.15	"	1.5	40.2	10.2	-	-
	Sep.	72.2	0.01	"	0.1	72.1	0	-	-
	Oct.	56.0	0.15	8,700	1.3	54.7	3.4	-	0
	Nov.	30.8	0.82	7,000	5.7	25.1	8.7	-	-
	Dec.	52.4	0.97	"	6.8	45.6	26.8	-	-
1975	Jan.	93.6	0.50	7,000	3.5	90.1	33.3	-	-
	Feb.	107.8	0.16	"	1.1	106.7	15.8	-	-
	Mar.	64.5	0.02	10,000	0.2	64.3	0.2	-	-
	Apr.	118.5	0.32	"	3.2	115.3	5.8	-	-
	May	260.0	0	"	0	260.0	10.0	-	-
	Jun.	168.0	0	"	0	168.0	8.0	-	-
	Jul.	163.0	0	"	0	163.0	17.9	-	-
	Aug.	100.8	0	"	0	100.8	8.0	-	-
	Sep.	65.1	0.01	"	0.1	65.0	0	-	-
	Oct.	73.3	0.20	"	2.0	71.3	4.6	-	-
	Nov.	91.3	0.79	"	7.9	83.4	20.2	-	-
	Dec.	59.4	0.72	"	7.2	52.2	23.8	-	-
1976	Jan.	142.6	0.58	10,000	5.8	136.8	31.3	-	-
	Feb.	70.3	0.15	"	1.5	68.8	17.3	-	-
	Mar.	67.6	0.01	"	0.1	67.5	0	-	-
	Apr.	47.4	0	"	0	47.4	5.8	-	-
	May	94.1	0	"	0	94.1	7.2	-	-
	Jun.	92.2	0	"	0	92.9	2.7	-	-
	Jul.	59.3	0.41	"	4.1	55.2	4.3	-	0
	Aug.	20.6	0.17	"	1.7	18.9	10.9	4.3	4.3
	Sep.	10.2	0.02	"	0.2	10.0	0	2.3	6.6
	Oct.	10.8	0.60	9,300	5.6	5.2	4.9	12.0	18.6
	Nov.	16.5	0.62	8,700	5.4	11.1	14.1	15.3	33.9
	Dec.	49.3	0.16	"	1.4	47.9	23.1	-12.5	21.4
1977	Jan.	237.3	0.62	8,700	5.4	231.9	19.1	-200.5	0
	Feb.	296.4	0.16	"	1.4	295.0	13.9	-	-
	Mar.	124.5	0.02	10,000	0.2	124.3	0.2	-	-
	Apr.	88.6	0.23	"	2.3	86.3	5.2	-	-
	May	38.1	0.36	"	3.6	34.5	14.5	-	-
	Jun.	300.2	0	"	0	300.2	0	-	-
	Jul.	39.6	0.66	9,500	6.3	33.3	20.4	-	-
	Aug.	26.4	0.17	"	1.6	24.8	10.1	-	-
	Sep.	15.1	0.02	10,000	0.2	14.9	0	-	0
	Oct.	11.6	0.64	"	6.4	5.2	7.1	14.2	14.2
	Nov.	14.9	1.04	8,100	8.6	6.3	18.6	24.6	38.8
	Dec.	30.2	0	"	0	30.2	18.8	0.9	39.7
1978	Jan.	96.9	0.59	8,100	4.8	92.1	26.6	-53.2	0
	Feb.	56.6	0.15	"	1.2	55.4	16.1	-	-
	Mar.	58.9	-	"		58.9	0	-	-

Note:

/1: Abbreviation

- Qo : Mean monthly discharge at Walimpong site
- Qu : Unit water requirement for Sanrego project
- Ia : Irrigation area of Sanrego project
- Qs : Diversion requirement of Sanrego project
  Qu x Ia
- Qa : Available discharge at Walimpong site
  Qo - Qd
- R : Required discharge of Walanae project
  26,000 ha
- D : Deficit of mean monthly discharge
  R + 12.3 - Qa
- Ad : Accumulated deficit

/2: River maintenance flow: 12.3 m^3/s

/3: Total required storage capacity

(i) Irrigation and river maintenance flow requirement
$39.7\ m^3/s \times 86,400 \times 30 = 103 \times 10^6\ m^3$

(ii) Evaporation loss from reservoir water surface
$0.711\ m \times 35 \times 10^6\ m^2 \times 0.75 = 19 \times 10^6\ m^3$

Total	$122 \times 10^6\ m^3$

Table 15.20 Irrigable Area and Required Storage Capacity for Alternative Plans of Padangeng Irrigation Project

Item		Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.
		1974/75												1975/76											
1. Mean monthly discharge	(m^3/s)	-	-	2.9	4.1	3.7	2.5	2.1	4.1	2.7	4.8	4.6	4.6	4.3	5.2	3.5	4.9	5.8	2.7	4.0	3.2	2.7	8.1	6.0	3.1
2. Unit water requirement	($\ell/s/ha$)	0.03	0.50	0.36	0.68	0.32	-	-	0	0.72	0.86	1.15	0.97	0.03	0.35	0.15	0.29	0.10	-	-	0.02	0.72	0.55	1.14	0.91
3. Irrigable area, Case-1 (Monthly)	(1,000 ha)	-	-	8.1	6.0	11.6	-	-	NL	3.8	5.6	4.0	4.7	143	14.9	23.3	16.3	58.0	-	-	160	3.8	15.8	5.8	4.0
4. " " " (Seasonal)	(ha)	---------- 4,200 ----------							---------- 3,800 ----------					---------- 4,200 ----------							---------- 3,800 ----------				
5. Diversion requirement, Case-2	(m^3/s)	0.1	2.1	1.5	2.9	1.3	0	0	0	3.0	3.6	4.8	4.1	0.1	1.5	0.6	1.2	0.4	0	0	0.1	3.0	2.3	4.8	3.8
6. Water deficit of Case-2 dam plan	(m^3/s)									0.9	-0.6	0.8	0.1	-3.6								0.9	-5.2		1.3
7. Accumulated deficit	(m^3/s)									0.9	0.3	1.1	1.2	0								0.9	0		1.3
		1976/77												1977/78											
1. Mean monthly discharge	(m^3/s)	2.1	2.1	3.1	3.2	3.1	1.2	2.1	0.6	1.5	4.4	12.9	13.8	6.0	7.9	4.7	13.4	3.6	2.2	0.9	0.3	1.1	4.4	6.6	4.9
2. Unit water requirement	($\ell/s/ha$)	0.03	0.47	0.16	0.40	0.31	-	-	0.03	0.29	0.72	0.43	0.69	0.03	0.32	0.50	0	0.64	-	-	0.03	0.72	0.40	1.02	0.91
3. Irrigable area, Case-1 (Monthly)	(1,000 ha)	70	4.5	19.4	8.0	10.0	-	-	2.0	5.2	6.1	30.0	20.0	200	24.7	9.4	NL	5.6	-	-	10.0	1.5	11.0	6.5	5.4
4. " " " (Seasonal)	(ha)	---------- 4,200 ----------							---------- 2,000 ----------					---------- 4,200 ----------							---------- 1,500 ----------				
5. Diversion requirement, Case-2	(m^3/s)	0.1	2.0	0.7	1.7	1.3	0	0	0.1	1.2	3.0	1.8	2.9	0.1	1.3	2.1	0	2.7	0	0	0.1	3.1	1.7	4.3	3.8
6. Water deficit of Case-2 dam plan	(m^3/s)	-1.4	0.5	-1.8						0.3	-0.8										0.4	2.6	-2.1	-1.7	
7. Accumulated deficit	(m^3/s)	0	0.5	0						0.3	0										0.4	3.0	0.9	0	

Table 15.21 Irrigable Area and Required Storage Capacity for Alternative Plans of Gilirang Irrigation Project

Item		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.
		1975/76												1976/77											
1. Mean monthly discharge	(m^3/s)	22.2	3.8	2.0	1.1	0.4	1.5	3.3	27.0	38.8	62.3	11.1	0.8	16.1	2.3	1.0	24.5	33.0	27.5	35.2	30.3	56.1	60.0	23.1	15.0
2. Unit water requirement	($\ell/s/ha$)	0.12	0.61	1.08	1.39	0.73	-	0	0	0	0	0.95	0.23	0.15	0.46	0.50	0.98	0.56	-	0.05	0.18	0	0.11	0.95	0.23
3. Diversion requirement, Case-2	(m^3/s)	1.2	6.1	10.8	13.9	7.3	0	0	0	0	0	9.5	2.3	1.5	4.6	5.0	9.8	5.6	0	0.5	1.8	0	1.1	9.5	2.3
4. Available discharge, Site-A	(m^3/s)	16.3	2.8	1.5	0.8	0.3	1.1	2.4	19.9	28.5	45.8	8.2	0.6	11.8	1.7	0.7	18.0	24.3	20.2	25.9	22.3	41.3	44.1	17.0	11.0
5. " " , Site-B	(m^3/s)	11.7	2.0	1.1	0.6	0.2	0.8	1.7	14.2	20.4	32.7	5.8	0.4	8.5	1.2	0.5	12.9	17.3	14.4	18.5	15.9	29.5	31.5	12.1	7.9
6. Irrigable area, Case-1 (Monthly)	(1,000 ha)	136	4.6	1.4	0.6	0.4	-	NL	NL	NL	NL	8.6	2.6	79	3.7	1.4	5.2	43.4	-	NL	124	NL	40.1	17.9	47.8
7. " " " (Seasonal)	(ha)	---------- 400 ----------						---------- 2,600 ----------						---------- 1,400 ----------						---------- 4,800 ----------					
8. Water deficit of Case-2 dam plan	(m^3/s)		5.1	10.7	14.3	8.1	0.2	-0.7	-13.2	-19.4	-31.7	4.7	2.9	-5.0	4.4	5.5	-2.1	-10.7							
9. Accumulated deficit	(m^3/s)		5.1	15.8	30.1	38.2	38.4	37.7	24.5	5.1	0	4.7	7.6	2.6	7.0	12.5	10.4	0							
		1977/78																							
1. Mean monthly discharge	(m^3/s)	11.9	2.0	3.8	14.9	2.3	9.4	19.6	68.3	7.5	23.3														
2. Unit water requirement	($\ell/s/ha$)	0.24	0.32	0	0.98	0.67	-	-	-	-	-														
3. Diversion requirement, Case-2	(m^3/s)	2.4	3.2	0	9.8	6.7	0																		
4. Available discharge, Site-A	(m^3/s)	8.8	1.5	2.8	11.0	1.7	6.9	14.4	50.3	5.5	17.1														
5. " " , Site-B	(m^3/s)	6.2	1.1	2.0	7.8	1.2	4.9	10.3	35.9	3.9	12.2														
6. Irrigable area, Case-1 (Monthly)	(1,000 ha)	36.7	4.7	NL	11.2	2.5	-																		
7. " " " (Seasonal)	(ha)	---------- 2,500 ----------																							
8. Water deficit of Case-2 dam plan	(m^3/s)		3.1	-1.0	3.0	6.5	-3.9	-9.3																	
9. Accumulated deficit	(m^3/s)		3.1	2.1	5.1	11.6	7.7	0																	

Note:

		Padangeng	Gilirang
/1	Catchment area at gauging station (km^2)	107	299
/2	Project area, Case-1 (ha)	4,200	4,800
	Case-2 (ha)	4,200	10,000
/3	Catchment area at intake or dam site, Site-A (km^2)	107	220
	Site-B (km^2)	107	157
/4	River maintenance flow (m^3/s)	0.6	1.0
/5	Required dam storage capacity ($10^6 m^3$)	9	110

Table 15.22 Irrigable Area with Natural Flow Intake for Proposed Project Areas

Irrigation Project	1973/74	1974/75	1975/76	1976/77	1977/78	Average	Minimum
Langkemme							
Wet season	-	5,000	5,000	5,000	5,000	5,000	5,000
Dry season	-	3,600	2,800	5,000	3,500	3,700	2,800
Bila							
Case-1							
Wet season	10,500	10,500	10,500	10,500	10,500	10,500	10,500
Dry season	6,600	7,500	4,800	9,000	6,300		4,800
Case-2							
Wet season	10,000	10,000	10,000	10,000	9,500	9,900	9,500
Dry season	5,000	5,600	3,600	6,900	4,800	5,200	3,600
Sanrego							
Wet season	10,000	10,000	10,000	10,000	9,500	9,900	9,500
Dry season	10,000	7,000	10,000	8,400	7,800	8,600	7,000
Lawo							
Wet season	-	3,000	3,000	3,000	3,000	3,000	3,000
Dry season	-	2,300	1,300	3,000	700	1,800	700
Boya							
Wet season	10,000	10,000	10,000	10,000	9,800	10,000	9,800
Dry season	9,100	10,000	10,000	10,000	10,000	9,800	9,100
Gilirang							
Wet season	-	-	-	2,600	4,800	3,700	2,600
Dry season	-	-	400	1,400	2,500	1,400	400
Padangeng							
Wet season	-	4,200	4,200	4,200	4,200	4,200	4,200
Dry season	-	3,800	3,800	2,000	1,500	2,800	1,500

Table 15.23 General Features and Cost Comparison on Alternative Intake Weir of Langkemme Project

Description	Alternative Weir Site - 1		Alternative Weir Site - 2	
General Features of Intake Structures				
1. Location	5.5 km upstream of the confluence of the Sero river		200 m downstream from Site - 1	
2. Geology	Cemented tuff breccia		Cemented tuff breccia	
3. River bed EL.	EL. 188 m		EL. 204 m	
4. Weir type	Fixed type concrete weir		Fixed type concrete weir	
5. Crest EL.	EL. 200 m		EL. 207 m	
6. Max. weir height	12 m		3 m	
7. Crest length	35 m		64 m including non-overflow section	
8. Scouring sluice	2 m width x 2 Nos.		2 m width x 2 Nos.	
9. Intake	2 m width x 2 Nos.		2 m width x 2 Nos.	
10. Head reach	Concrete box culvert L = 200 m		No needed	
Direct Construction Cost				
		(10^3US$)		(10^3US$)
1. Preparatory works	L.S	170	L.S	230
2. Concrete works	4,500 m^3	450	32,000	3,200
3. Earth works	18,500 m^3	90	38,500	140
4. Metal works	20 tons	150	25	190
5. Miscellaneous	L.S	40	L.S	190
Sub-total		900		3,950
6. Head reach	200 m	340		-
Total		1,200		3,950

Table 15.24 General Features of Alternative Intake Methods of Bila Irrigation Project

Description	Case-1	Case-2	Case-3
1. Intake method	Intake without flow regulation by weir	Intake without flow regulation by weir	Intake with flow regulation by dam
2. Location	9 km upstream of the confluence with the Kalola river	5.5 km upstream of Case-1 site	Same as Case-1 site
3. Catchment area	376 km^2	287 km^2	376 km^2
4. River bed EL.	23 m	35 m	23 m
5. Irrigation area (Wet season) (Dry season)	10,500 ha (10,500 ha) (6,600 ha)	10,000 ha (10,000 ha) (5,200 ha)	12,000 ha (12,000 ha) (12,000 ha)
6. Intake facilities			
(1) Type	Fixed type concrete weir	Fixed type concrete weir	Central core type rockfill dam
(2) Design flood	1,200 m^3/s (100 yrs. probability)	1,000 m^3/s (100 yrs. probability)	1,500 m^3/s (1,000 yrs. probability)
(3) Max. diversion requirement	13.8 m^3/s	13.1 m^3/s	15.7 m^3/s
(4) Structural dimension	Weir crest EL: 35 m Crest length L : 86 m	Weir crest EL: 37 m Crest length L : 60 m	Required storage V: 62 x $10^6 m^3$ LWL : 43.5 m HWL : 51.5 m Crest EL : 57.0 m Crest length: 3,000 m Max. dam height: 34 m

Table 15.25 General Features of Alternative Intake Methods of Gilirang Irrigation Project

Description	Case-1	Case-2
1. Intake method	Intake without flow regulation by weir	Intake with flow regulation by dam
2. Location	Northeast of the village of Watang Gilirang	12 km upstream of Case-1 site
3. Catchment area	220 km^2	157 km^2
4. River bed EL	11 m	20 m
5. Irrigation area	4,800 ha	10,000 ha
(Wet season)	(4,800 ha)	(10,000 ha)
(Dry season)	(1,400 ha)	(10,000 ha)
6. Intake facilities		
(1) Type	All movable weir	Central core type rockfill dam
(2) Design flood	860 m^3/sec (100 years probability)	1,000 m^3/sec (1,000 years probability)
(3) Maximum diversion requirement	6.7 m^3/sec	13.9 m^3/sec
(4) Structural dimension	Gate crest EL: 20 m Gate size : 20 m wide x 3 m high x 2 Nos Diversion channel: Base width : 55 m Base EL : 11 m Berm EL : 22 m Length (including weir) : 200 m	Required storage : 110 x 10^6 m^3 LWL : 33 m FWL : 51.5 m HWL : 50.0 m Crest EL: 55.0 m Crest length : 185 m Maximum dam height : 35.0 m

Table 15.26 General Features of Alternative Intake Methods of Padangeng Irrigation Project

Description	Case-1	Case-2
1. Intake method	Intake without flow regulation by weir	Intake with flow regulation by dam
2. Location	1 km south west of the village Tajuncu	Same site as Case-1
3. Catchment area	107 km^2	107 km^2
4. River bed EL	29 m	29 m
5. Irrigation area	4,200 ha	4,200 ha
(Wet season)	(4,200 ha)	(4,200 ha)
(Dry season)	(2,800 ha)	(4,200 ha)
6. Intake facilities		
(1) Type	Fixed type concrete weir	Gravity type concrete dam
(2) Design flood	600 m^3/sec (100 years probability)	720 m^3/sec (200 years probability)
(3) Maximum diversion requirement	4.8 m^3/sec	4.8 m^3/sec
(4) Structural dimension	Weir crest EL: 40 m Crest length : 60 m Max. weir height : 11 m	Required storage 9×10^3 m^3 LWL : 50.0 m FWL : 61.3 m HWL : 58.0 m Crest EL : 64.3 m Crest length : 270.0 m Maximum dam height : 35.3 m

Table 15.27 General Features of Alternative Pumping Plans of Cenranae Irrigation Project

Description	Case-1	Case-2
1. Irrigation area	2,300 ha	6,500 ha
2. Maximum diversion requirement	3.3 m^3/sec	9.2 m^3/sec
3. Water level		
Outlet WEL	15.0 m	30.0 m
Inlet WEL	3.0 m	3.0 m
4. Pump station		
(1) Pump		
Rating capacity	1.1 m^3/sec (each)	3.3 m^3/sec (each)
Number	4 sets (including one spare)	4 sets (including one spare)
Rating head	15 m	30 m
Type	Double suction type volute pump	Double suction type volute pump
Diameter	ø700 x ø600	ø1,100 x ø900
(2) Motor		
Output	230 KW (each)	1,260 KW (each)
(3) Pump station		
Floor area	25 m x 14 m	50 m x 17 m
(4) Discharge pipe		
Number	1 Nos	1 Nos
Diameter	ø1,400 mm	ø2,200
Length	300 m	300 m
(5) Inlet channel		
Channel type	Trapezoidal earth	Trapezoidal earch
Length	1.2 km	1.2 km

Table 15.28 Principal Features of Langkemme Irrigation Project

1. Name of Project	Langkemme Irrigation Project
2. Source of irrigation water	Langkemme river
3. Net irrigation area	5,000 ha
4. Maximum diversion water requirement	5.8 m^3/sec
5. Irrigation facilities	
(1) Langkemme intake weir	
Location	5.5 km upstream of the confluence with the Sero river
Catchment area	100 km^2
Geology	Tuff breccia
River bed EL.	204 m
Design flood	600 m/sec (100 years probability)
Weir type	Fixed type concrete weir
Crest EL.	207 m
Weir height at maximum	3 m
Crest-length	35 m
Scouring sluice	2 m width x 2 nos.
Intake gate	2.5 m width x 2 nos.
(2) Main irrigation canal with related structures	
Canal type	Trapezoidal earth canal
Length	38 km
Discharge	5.8 m^3/sec to 1.2 m^3/sec
(3) Secondary irrigation canal with related structures	
Canal type	Trapezoidal earth canal
Length	45 km
Number	10 nos.
6. Drainage facilities with related structure	
Canal type	Trapezoidal earth canal
Length	32 km
7. Tertiary system	
Area to be served	5,000 ha
Tertiary unit	Average 150 ha
Facilities	Tertiary and quaternary canal, tertiary and quaternary drain and farm road

Table 15.29 Principal Features of Bila Irrigation Project

1.	Name of Project	Bila Irrigation Project
2.	Source of irrigation water	Bila river
3.	Net irrigation area	10,500 ha
4.	Maximum diversion water requirement	13.8 m^3/sec
5.	Irrigation facilities	
(1)	Bila intake weir	
	Location	2 km downstream of confluence with with the Betau river
	Catchment area	376 km^2
	Riverbed EL.	215 m
	Geology	Mud stone and shale
	Design flood	1,200 m^3/sec (100 years probability)
	Weir type	Fixed type concrete weir
	Crest EL.	35.0 m
	Weir height at maximum	13.5 m
	Crest length	86 m with width of piers
	Scouring sluice	8 m width x 2 Nos.
	Intake gate	2.0 m width x 6 Nos.
	Flood dyke	Crest EL. 40.3 m
(2)	Main irrigation canal with related structures	
	Canal type	Trapezoidal earth canal
	Length	Right main canal: 1 km Left main canal : 42 km
	Discharge	Right main canal: 1.6 m^3/sec Left main canal : 12.2 m^3/sec to 1.9 m^3/sec
(3)	Secondary irrigation canal with related structures	
	Canal type	Trapezoidal earth canal
	Length	91 km
	Number	11 Nos.
6.	Drainage facilities with related structures	
	Canal type	Trapezoidal earth canal
	Length	63 km
7.	Land preparation	200 ha
8.	Tertiary system	
	Area to be served	10,500 ha
	Tertiary unit	Average 150 ha
	Facilities	Tertiary and quaternary canal, tertiary and quaternary drain and farm road

Table 15.30 Principal Features of Sanrego Irrigation Project

1. Name of Project	Sanrego Irrigation Project
2. Source of irrigation water	Sanrego river
3. Net irrigation area	10,000 ha
4. Maximum diversion water requirement	10.6 m^3 sec
5. Irrigation facilities	
(1) Sanrego intake weir	
Location	0.3 km southwest of village Batu-Batu
Geology	Outcropped sandstone
Catchment area	176 km^2
Riverbed EL.	158 m
Design flood	800 m^3/sec (100 years probability)
Weir type	Fixed type concrete weir
Crest EL.	170.0 m
Weir height at maximum	12 m
Crest length	48 m with width of piers
Scouring sluice	4.5 m width x 2 Nos.
Intake gate	2.0 m width x 5 Nos.
(2) Main irrigation canal with related structures	
Canal type	Trapezoidal earth canal
Length	Right main canal: 40 km Left main canal : 10 km
Discharge	Right main canal: 10.6 m^3/sec to 1.6 m^3/sec Left main canal : 2.4 m^3/sec to 1.4 m^3/sec
(3) Secondary irrigation canal	
Canal type	Trapezoidal earth canal
Length	97 km
Number	17 Nos.
6. Drainage facilities with related structures	
Canal type	Trapezoidal earth canal
Length	53 km
7. Land preparation	1,900 ha
8. Tertiary system	
Area to be served	10,000 ha
Tertiary unit	Average 150 ha
Facilities	Tertiary and quaternary canal, tertiary and quaternary drain and farm road

Table 15.31 Principal Features of Lawo Irrigation Project

1.	Name of Project	Lawo Irrigation Project
2.	Source of irrigation water	Lawo river
3.	Net irrigation area	3,000 ha
4.	Maximum diversion water requirement	3.5 m^3/sec
5.	Irrigation facilities	
(1)	Lawo intake weir	
	Location	0.6 km upstream of water level ganging station
	Geology	Andesite
	Catchment area	64 km^2
	Riverbed EL.	117 m
	Design flood	500 m/sec (100 years probability)
	Weir type	Fixed type concrete weir
	Crest EL.	120.0 m
	Weir height at maximum	3 m
	Crest length	30 m
	Scouring sluice	3 m width x 1 Nos.
	Intake gate	1.5 m width x 2 Nos.
(2)	Main irrigation canal with related structures	
	Canal type	Trapezoidal earth canal
	Length	6 km
	Discharge	3.5 m^3/sec to 1.8 m^3/sec
(3)	Secondary irrigation canal	
	Canal type	Trapezoidal earth canal
	Length	30 km
	Number	4 Nos.
6.	Drainage facilities with related structures	
	Canal type	Trapezoidal earth canal
	Length	20 km
7.	Tertiary system	
	Area to be served	3,000 ha
	Tertiary unit	Average 150 ha
	Facilities	Tertiary and quaternary canal, tertiary and quaternary drain and farm road

Table 15.32 Principal Features of Boya Irrigation Project

1. Name of Project	Boya Irrigation Project
2. Source of irrigation water	Boya river
3. Net irrigation area	10,000 ha
4. Maximum diversion water requirement	12.8 m^3/sec
5. Irrigation facilities	
(1) Boya intake weir	
Location	At the existing Bule Cenranae intake weir site
Geology	
Catchment area	512 km^2
Riverbed EL.	Upstream : 24.4 m Downstream: 23.4 m
Design flood	1,400 m/sec (100 years probability)
Weir type	Fixed type concrete weir
Crest EL.	30.0 m
Weir height at maximum	5.6 m
Crest length	80 m
Scouring sluice	8 m width x 2 Nos.
Intake gate	2.0 m width x 5 Nos.
(2) Main irrigation canal with related structures	
Canal type	Trapezoidal earth canal
Length	32 km
Discharge	12.8 m^3/sec to 3.5 m^3/sec
(3) Secondary irrigation canal with related structures	
Canal type	Trapezoidal earth canal
Length	40 km
Number	6 Nos.
6. Drainage facilities with related structures	
Canal type	Trapezoidal earth canal
Length	28 km
7. Tertiary system	
Area to be served	10,000 ha
Tertiary unit	Average 150 ha
Facilities	Tertiary and quaternary canal, tertiary and quaternary drain and farm road

Table 15.33 Principal Features of Walanae Irrigation Project

1. Name of Project	Walanae Irrigation Project
2. Source of irrigation water	Walimpong reservoir
3. Net irrigation area	26,000 ha, Cenranae area Walanae area
4. Maximum diversion water requirement	33.3 m^3/sec
5. Irrigation facilities	
(1) Intake at Mong dam	
Right bank	
Intake WEL at outlet	59.0 m
Intake	Width 3 m x Height 7 m x 4 Nos.
Left bank	
Intake WEL at outlet	59.0 m
Intake	Width 3 m x Height 7 m x 3 Nos.
(2) Main irrigation canal with related structures	
Canal type	Trapezoidal earth canal
Length	Right main canal: 75 km Left main canal : 37 km
Discharge	Right main canal: 26.5 m^3/sec to 4.7 m^3/sec Left main canal : 6.8 m^3/sec to 2.2 m^3/sec
(3) Secondary irrigation canal	
Canal type	Trapezoidal earth canal
Length	175 km
Number	45 Nos.
6. Drainage facilities with related structures	
Canal type	Trapezoidal earth canal
Length	180 km
7. Land preparation	5,500 ha
8. Tertiary system	
Area to be served	26,000 ha
Tertiary unit	Average 150 ha
Facilities	Tertiary and quaternary canal, tertiary and quaternary drain and farm road

Table 15.34 Principal Features of Gilirang Irrigation Project

1. Name of Project	Gilirang Irrigation Project
2. Source of irrigation water	Gilirang reservoir
3. Net irrigation area	10,000 ha
4. Maximum diversion water requirement	13.9 m^3
5. Irrigation facilities	
(1) Gilirang dam	
Location	11 km upstream from Watang Gilirang
Geology	Cemented mudstone, sandstone and conglomerate
Catchment area	157 km^2
Riverbed EL.	20 m
Design flood	1,000 m^3/sec (1,000 years probability)
Dam type	Central core type rockfill dam
Low water level	33 m
High water level	50.0 m
Flood water level	51.5 m
Total storage	122 x 10^6 m^3
Effective storage	110 x $10^6 m^3$
Crest EL.	55.0 m
Dam height at maximum	35.0 m (from river bed)
Crest length of dam	185.0 m
Spillway	Overflow type non-gate control spillway
(2) Main irrigation canal with related structures	
Canal type	Trapezoidal earth canal
Length	Right main canal: 63 km Left main canal : 24 km
Discharge	Right main canal: 13.9 m^3/sec to 3.2 m^3/sec Left main canal : 4.2 m^3/sec to 1.9 m^3/sec
(3) Secondary irrigation canal	
Canal type	Trapezoidal earth canal
Length	86 km
Nos.	17 Nos.
6. Drainage facilities with related structures	
Canal type	Trapezoidal earth canal
Length	43 km
7. Tertiary system	
Area to be served	10,000 ha
Tertiary unit	Average 150 ha
Facilities	Tertiary and quaternary canal, tertiary and quaternary drain and farm road

Table 15.35 Principal Features of Padangeng Irrigation Project

1.	Name of Project	Padangeng Irrigation Project
2.	Source of irrigation water	Padangeng reservoir
3.	Net irrigation area	4,200 ha
4.	Maximum diversion water requirement	4.8 m^3/sec
5.	Irrigation facilities	
(1)	Padangeng dam	
	Location	1 km southwest of village Tajuncu
	Geology	Andesite and andesitic tuff breccia
	Catchment area	107 km^2
	Riverbed EL.	29 m
	Design flood	720 m^3/sec (200 years probability)
	Dam type	Concrete gravity type dam
	Low water level	50 m
	High water level	58 m
	Flood water level	62.3 m
	Total storage	17 x 10^6 m^3
	Effective storage	9 x 10^6 m^3
	Crest EL.	64.3 m
	Dam height at maximum	35.3 m (from river bed)
	Crest length	270 m
	Spillway	Overflow type non-gate controlled spillway
(2)	Main irrigation canal with related structures	
	Canal type	Trapezoidal earth canal
	Length	Right main canal: 10 km Left main canal : 30 km
	Discharge	Right main canal: 1.7 m^3/sec to 1.0 m^3/sec Left main canal : 4.8 m^3/sec to 1.9 m^3/sec
(3)	Secondary irrigation canal with related structures	
	Canal type	Trapezoidal earth canal
	Length	23 km
	Nos.	7 Nos.
6.	Drainage facilities with related structures	
	Canal type	Trapezoidal earth canal
	Length	23 km
7.	Land preparation	120 ha
8.	Tertiary system	
	Area to be served	4,200 ha
	Tertiary unit	Average 150 ha
	Facilities	Tertiary and quaternary canal, tertiary and quaternary drain, and farm road

Table 15.36 Principal Features of Cenranae Irrigation Project

1.	Name of Project	Cenranae Irrigation Project
2.	Source of irrigation water	Lake Tempe
3.	Net irrigation area	2,300 ha
4.	Maximum diversion water requirement	3.3 m^3/sec
5.	Irrigation facilities	
(1)	Cenranae Pumping Station	
	Location	Southern edge of Sengkang
	Water level	
	Outlet WEL.	15.0 m
	Inlet WEL.	3.0 m (Lake Tempe L.W.L 3.5 m)
	Pump Rating capacity	1.1 m^3/sec each
	Number	4 sets including one spare
	Rating head	15.0 m
	Type	Double suction type volute pump
	Diameter	ø700 mm x ø600 mm
	Motor Output	220 kW each
	Pump station flood area	25 m x 14 m (350 m^2)
	Discharge pipeline	
	Number	1 No.
	Diameter	ø1,400 mm
	Material	Steel
	Length	300 m
	Inlet channel	Earth canal with base width of 2.0 m and base gradient 1/4,000
(2)	Main irrigation canal with related structures	
	Canal type	Trapezoidal earth canal
	Length	27 km
	Discharge	3.3 m^3/sec to 0.6 m^3/sec
(3)	Secondary irrigation canal with related structures	
	Canal type	Trapezoidal earth canal
	Length	21 km
	Number	6 Nos.
6.	Drainage facilities with related structures	
	Canal type	Trapezoidal earth canal
	Length	15 km
7.	Tertiary system	
	Area to be served	2,300 ha
	Tertiary unit	Average 150 ha
	Facilities	Tertiary and quaternary canal, tertiary and quaternary drain and farm road

Table 15.37 Construction Cost of Langkemme Irrigation Project

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Works	L.S.		240
2.	Intake Structures			
	Diversion works	L.S.		170
	Earth works	m^3	18,500	90
	Concrete works	m^3	4,500	450
	Metal works	ton	20	150
	Head reach	m	200	340
	Others	L.S.		40
	Sub-total Item 2			1,240
3.	Main Irrigation Canal	km	38	7,560
4.	Secondary Canal	km	45	3,640
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		1,890
	Secondary Irrigation Canal	L.S.		620
6.	Tertiary System	ha	5,000	1,250
7.	Drainage Canal	km	32	190
8.	Replacement of Powerhouse	L.S.		120
	Sub-total Item 1 to 8			16,750
9.	Land Acquisition and Compensation	L.S.		200
	Sub-total Item 1 to 9			16,950
10.	Physical Contingency/1	L.S.		3,390
11.	Engineering Services and Administration Expenses/2	L.S.		2,060
	Total			22,400

Note: /1: 20% of total of Item 1 to 9
/2: 10% of total of Item 1 to 10

Table 15.38 (1) Construction Cost of Bila Irrigation Project
(Case-1)

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Works	L.S.		340
2.	Intake Structure			
	Diversion Works	L.S.		200
	Earth Works	m^3	100,000	480
	Concrete Works	m^3	24,500	2,450
	Metal Works	ton	87	660
	Others	L.S.		190
	Sub-total Item 2			3,980
3.	Main Irrigation Canal	km	43	10,050
4.	Secondary Irrigation Canal	km	91	9,290
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		2,600
	Secondary Irrigation Canal	L.S.		1,560
6.	Tertiary System	ha	10,500	2,620
7.	Land Preparation	ha	200	50
8.	Drainage Canal	km	63	910
	Sub-total Item 1 to 8			31,400
9.	Land Acquisition and Compensation	L.S.		390
	Sub-total Item 1 to 9			31,790
10.	Physical Contingency /1	L.S.		6,360
11.	Engineering Services and Administrative Expenses /2	L.S.		3,850
	Total			42,000

Note: /1: 20% of total of Item 1 to 9
/2: 10% of total of Item 10

Table 15.38 (2) Construction Cost of Bila Irrigation Project
(Case 2)

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Work	L.S.		300
2.	Intake Structure			
	Diversion Works	L.S.		170
	Earth Works	m^3	22,500	110
	Concrete Works	m^3	9,200	920
	Metal Works	ton	68	510
	Others	L.S.		90
	Sub-total Item 2			1,900
3.	Main Irrigation Canal	km	47	11,100
4.	Secondary Irrigation Canal	km	82	9,200
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		2,600
	Secondary Irrigation Canal	L.S.		1,560
6.	Tertiary System	ha	10,000	2,380
7.	Land Preparation	ha	200	50
8.	Drainage Canal	km	60	910
	Sub-total Item 1 to 8			29,900
9.	Land Acquisition and Compensation	L.S.		360
	Sub-total Item 1 to 9			30,260
10.	Physical Contingency/1	L.S.		6,050
11.	Engineering Services and Administrative Expenses/2	L.S.		3,590
	Total			39,900

Note: /1: 20% of total of Item 1 to 9
/2: 10% of total of Item 1 to 10

Table 15.38 (3) Construction Cost of Bila Irrigation Project
(Case-3)

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Work	L.S.		1,200
2.	Intake Structure			
	Diversion Works	L.S.		5,900
	Main and Coffer Dams	L.S.		14,400
	Spillway	L.S.		5,700
	Intake	L.S.		1,300
	Metal Works	L.S.		2,500
	Others	L.S.		3,000
	Sub-total Item 2			32,800
3.	Main Irrigation Canal	km	55	11,870
4.	Secondary Irrigation Canal	km	101	11,590
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		3,400
	Secondary Irrigation Canal	L.S.		2,090
6.	Tertiary System	ha	12,000	3,000
7.	Land Preparation	ha	250	70
8.	Drainage Canal	km	70	1,080
	Sub-total Item 1 to 8			67,100
9.	Land Acquisition and Compensation	L.S.		500
	Sub-total Item 1 to 9			67,600
10.	Physical Contingency/1	L.S.		13,500
11.	Engineering Services and Administrative Expenses/2	L.S.		8,100
	Total			89,200

Note: /1: 20% of total of Item 1 to 9
/2: 10% of total of Item 1 to 10

Table 15.39 Construction Cost of Sanrego Irrigation Project

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Work	L.S.		300
2.	Intake Structure			
	Diversion Works	L.S.		240
	Earth Works	m^3	58,000	340
	Concrete Works	m^3	15,500	1,550
	Metal Works	ton	58	440
	Others	L.S.		130
	Sub-total Item 2			2,700
3.	Main Irrigation Canal	km	50	10,600
4.	Secondary Irrigation Canal	km	97	6,780
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		2,760
	Secondary Irrigation Canal	L.S.		1,210
6.	Tertiary System	ha	10,000	2,500
7.	Land Preparation	ha	1,900	660
8.	Drainage Canal	km	53	490
	Sub-total Item 1 to 8			28,000
9.	Land Acquisition and Compensation	L.S.		370
	Sub-total Item 1 to 9			28,370
10.	Physical Contingency/1	L.S.		5,670
11.	Engineering Services and Administrative Expenses/2	L.S.		3,460
	Total			37,500

Note: /1: 20% of total of Item 1 to 9
/2: 10% of total of Item 1 to 10

Table 15.40 Construction Cost of Lawo Irrigation Project

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Work	L.S.		210
2.	Intake Structure			
	Diversion Works	L.S.		150
	Earth Works	m^3	8,000	40
	Concrete Works	m^3	6,000	750
	Metal Works	ton	15	110
	Others	L.S.		50
	Sub-total Item 2			1,100
3.	Main Irrigation Canal	km	6	2,080
4.	Secondary Irrigation Canal	km	30	2,600
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		480
	Secondary Irrigation Canal	L.S.		420
6.	Tertiary System	ha	3,000	750
7.	Drainage Canal	km	20	110
	Sub-total Item 1 to 7			7,750
8.	Land Acquisition and Compensation	L.S.		150
	Sub-total Item 1 to 8			7,900
9.	Physical Contingency/1	L.S.		1,580
10.	Engineering Services and Administrative Expenses/2	L.S.		1,020
	Total			10,500

Note: /1: 20% of total of Item 1 to 8
/2: 10% of total of Item 1 to 9

Table 15.41 Construction Cost of Boya Irrigation Project

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Work	L.S.		350
2.	Intake Structure			
	Diversion Works	L.S.		430
	Earth Works	m^3		160
	Concrete Works	m^3		500
	Metal Works	ton		480
	Others	L.S.		80
	Sub-total Item 2			1,650
3.	Main Irrigation Canal	km	32	6,480
4.	Secondary Irrigation Canal	km	40	3,950
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		1,800
	Secondary Irrigation Canal	L.S.		740
6.	Tertiary System	ha	10,000	2,500
7.	Drainage Canal	km	28	230
	Sub-total Item 1 to 7			17,700
8.	Land Acquisition and Compensation	L.S.		360
	Sub-total Item 1 to 8			18,060
9.	Physical Contingency/1	L.S.		3,600
10.	Engineering Services and Administrative Expenses/2	L.S.		2,240
	Total			23,900

Note: /1: 20% of total of Item 1 to 8
/2: 10% of total of Item 1 to 9

Table 15.42 (1) Specific Construction Cost of Walanae Irrigation Project

(Case-1, Water Supply from Mong Reservoir)

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Works	L.S.		1,200
2.	Intake Facilities	L.S.		2,300
3.	Main Irrigation Canal	km	112	27,480
4.	Secondary Irrigation Canal	km	175	17,300
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		15,730
	Secondary Irrigation Canal	L.S.		3,100
6.	Tertiary System	ha	26,000	6,500
7.	Land Preparation	ha	5,500	1,910
8.	Drainage Canal	km	180	2,280
	Sub-total Item 1 to 8			77,800
9.	Land Acquisition and Compensation	L.S.		1,250
	Sub-total Item 1 to 9			79,050
10.	Physical Contingency/1	L.S.		15,800
11.	Engineering Services and Administrative Expenses/2	L.S.		9,550
	Total			104,400

Note: /1: 20% of total of Item 1 to 9
/2: 10% of total of Item 1 to 10

Table 15.42 (2) Specific Construction Cost of Walanae Irrigation Project

(Case-2, Water Supply from Walimpong Reservoir)

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Works	L.S.		1,200
2.	Intake Facilities	L.S.		2,100
3.	Main Irrigation Canal	km	119	27,940
4.	Secondary Irrigation Canal	km	175	17,300
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		16,470
	Secondary Irrigation Canal	L.S.		3,100
6.	Tertiary system	ha	26,000	6,500
7.	Land Preparation	ha	5,500	1,910
8.	Drainage Canal	km	180	2,280
	Sub-total Item 1 to 8			78,800
9.	Land Acquisition and Compensation	L.S.		1,300
	Sub-total Item 1 to 9			80,100
10.	Physical Contingency/1	L.S.		16,100
11.	Engineering Services and Administrative Expenses/2	L.S.		9,700
	Total			105,900

Note: /1: 20% of total of Item 1 to 9
/2: 10% of total of Item 1 to 10

Table 15.43 (1) Construction Cost of Gilirang Irrigation Project
(Case-1)

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Work	L.S.		240
2.	Intake Structure			
	Preparatory Works	L.S.		120
	Earth Works	m^3	176,000	620
	Concrete Works	m^3	6,500	650
	Metal works	ton	100	750
	Others	L.S.		120
	Sub-total Item 2			2,360
3.	Main Irrigation Canal	km	63	10,440
4.	Secondary Irrigation Canal	km	42	3,040
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		2,190
	Secondary Irrigation Canal	L.S.		570
6.	Tertiary System	ha	4,800	1,200
7.	Drainage Canal	km	30	160
	Sub-total Item 1 to 7			20,200
8.	Land Acquisition and Compensation	L.S.		200
	Sub-total Item 1 to 8			20,400
9.	Physical Contingency/1	L.S.		4,080
10.	Engineering Services and Administrative Expenses/2	L.S.		2,420
	Total			26,900

Note: /1: 20% of total of Item 1 to 8
/2: 10% of total of Item 1 to 9

Table 15.43 (2) Construction Cost of Gilirang Irrigation Project

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Work	L.S.		800
2.	Gilirang Dam			
	Diversion Works	L.S.		2,400
	Main and Coffer Dams	L.S.		3,000
	Spillway	L.S.		3,500
	Intake	L.S.		1,200
	Metal Works	L.S.		1,500
	Others	L.S.		1,200
	Sub-total Item 2			12,800
3.	Main Irrigation Canal	km	87	18,900
4.	Secondary Irrigation Canal	km	86	7,550
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		4,750
	Secondary Irrigation Canal	L.S.		1,250
6.	Tertiary System	ha	10,000	2,500
7.	Drainage Canal	km	43	450
	Sub-total Item 1 to 7			49,000
8.	Land Acquisition and Compensation	L.S.		400
	Sub-total Item 1 to 8			49,400
9.	Physical Contingency/1	L.S.		9,880
10.	Engineering Services and Administrative Expenses/2	L.S.		5,920
	Total			65,200

Note: /1: 20% of total of Item 1 to 8
/2: 10% of total of Item 1 to 9

Table 15.44 (1) Construction Cost of Padangeng Irrigation Project
(Case-1)

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Work	L.S.		250
2.	Intake Structure			
	Diversion Works	L.S.		240
	Earth Works	m^3	33,000	160
	Concrete Works	m^3	15,800	1,580
	Metal Works	ton	20	150
	Others	L.S.		110
	Sub-total Item 2			2,240
3.	Main Irrigation Canal	km	40	4,180
4.	Secondary Irrigation Canal	km	23	1,750
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		990
	Secondary Irrigation Canal	L.S.		280
6.	Tertiary System	ha	4,200	1,050
7.	Land Preparation	ha	120	30
8.	Drainage Canal	km	23	130
	Sub-total Item 1 to 8			10,900
9.	Land Acquisition and Compensation	L.S.		200
	Sub-total Item 1 to 9			11,100
10.	Physical Contingency/1	L.S.		2,220
11.	Engineering Services and Administrative Expenses/2	L.S.		1,380
	Total			14,700

Note: /1: 20% of total of Item 1 to 9
/2: 10% of total of Item 1 to 10

Table 15.44 (2) Construction Cost of Padangeng Irrigation Project
(Case-2)

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Work	L.S.		280
2.	Padangeng Dam			
	Dam			
	Diversion Works	L.S.		240
	Earth Works	m^3	44,400	160
	Concrete Works	m^3	73,000	5,840
	Metal Works	ton	20	150
	Others	L.S.		240
	Intake	L.S.		320
	Sub-total Item 2			6,950
3.	Main Irrigation Canal	km	40	4,180
4.	Secondary Irrigation Canal	km	23	1,750
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		950
	Secondary Irrigation Canal	L.S.		280
6.	Tertiary System	ha	4,200	1,050
7.	Land Preparation	ha	120	30
8.	Drainage Canal	km	23	130
	Sub-total Item 1 to 8			15,600
9.	Land Acquisition and Compensation	L.S.		240
	Sub-total Item 1 to 9			15,840
10.	Physical Contingency/1	L.S.		3,170
11.	Engineering Services and Administrative Expenses/2	L.S.		1,890
	Total			20,900

Note: /1: 20% of total of Item 1 to 9
/2: 10% of total of Item 1 to 10

Table 15.45 (1) Construction Cost of Cenranae Irrigation Project
(Case-1)

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Works	L.S.		200
2.	Pumping Station			
	Civil Works	L.S.		950
	Mechanical Electrical Works	L.S.		1,150
	Sub-total Item 2			2,100
3.	Main Irrigation Canal	km	27	4,400
4.	Secondary Irrigation Canal	km	21	1,320
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		1,170
	Secondary Irrigation Canal	L.S.		230
6.	Tertiary System	ha	2,300	580
7.	Drainage Canal	km	15	100
	Sub-total Item 1 to 7			10,100
8.	Land Acquisition and Compensation	L.S.		150
	Sub-total Item 1 to 8			10,250
9.	Physical Contingency/1	L.S.		2,050
10.	Engineering Services and Administrative Expenses/2	L.S.		1,300
	Total			13,600

Note: /1: 20% of total of Item 1 to 8
/2: 10% of total of Item 1 to 9

Table 15.45 (2) Construction Cost of Cenranae Irrigation Project
(Case-2)

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Works	L.S.		270
2.	Pump Station			
	Civil Works	L.S.		1,760
	Mechanical Electrical Works	L.S.		3,120
	Sub-total Item 2			4,880
3.	Main Irrigation Canal	km	65	13,400
4.	Secondary Irrigation Canal	km	53	3,900
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		4,100
	Secondary Irrigation Canal	L.S.		870
6.	Tertiary System	L.S.	6,500	1,630
7.	Land Preparation	ha	100	30
8.	Drainage Canal	km	37	220
	Sub-total Item 1 to 8			29,300
9.	Land Acquisition and Compensation	L.S.		250
	Sub-total Item 1 to 9			29,550
10.	Physical Contingency/1	L.S.		5,910
11.	Engineering Services and Administrative Expenses/2	L.S.		3,540
	Total			39,000

Note: /1: 20% of total of Item 1 to 9
/2: 10% of total of Item 1 to 10

Table 15.45 (3) Construction Cost of Cenranae Irrigation Project
(Case-3, driven with diesel engines)

(Unit: 10^3US$)

Item No.	Work Item	Unit	Quantity	Amount
1.	Preparatory Works	L.S.		210
2.	Pump Station			
	Civil Works	L.S.		1,010
	Mechanical Electrical Works	L.S.		1,450
	Sub-total Item 2			2,460
3.	Main Irrigation Canal	km	27	4,530
4.	Secondary Irrigation Canal	km	21	1,320
5.	Irrigation Canal Structure			
	Main Irrigation Canal	L.S.		1,170
	Secondary Irrigation Canal	L.S.		230
6.	Tertiary System	ha	2,300	580
7.	Drainage Canal	km	15	100
	Sub-total Item 1 to 7			10,600
8.	Land Acquisition and Compensation	L.S.		150
	Sub-total Item 1 to 8			10,750
9.	Physical Contingency/1	L.S.		2,150
10.	Engineering Services and Administrative Expenses/2	L.S.		1,300
	Total			14,200

Note: /1: 20% of total of Item 1 to 8
/2: 10% of total of Item 1 to 9

Table 15.46 Annual Operation, Maintenance and Replacement Cost

(Unit: 10^3US$)

Project Name	Annual O.M & R Cost
1. Langkemme Irrigation Project	272
2. Bila Irrigation Project	
Case-1	511
Case-2	486
Case-3	1,077
3. Sanrego Irrigation Project	450
4. Lawo Irrigation Project	133
5. Boya Irrigation Project	372
6. Walanae Irrigation Project	
Case-1 (Mong dam plan)	1,323
Case-2 (Walimpong dam plan)	1,341
7. Gilirang Irrigation Project	
Case-1	323
Case-2	782
8. Padangeng Irrigation Project	
Case-1	207
Case-2	282
9. Cenranae Irrigation Project/1	
Case-1	220
Case-2	684
Case-3	254

Note: /1: In estimates of annual O.M & R Cost of the Cenranae Irrigation Project, the following are included.

Case	Electric energy or fuel cost (10^3US$)	Replacement cost of pump equipment (discount rate, 12%) (10^3US$)
Case-1	35	22
Case-2	169	58
Case-3	55	28

Table 15.47 (1) Basic Data on Cost Estimate of Project Works

Canal System

Design Discharge (m^3/sec)	Unit Cost				
	Canal Works (US$/m)	Structure Works			
		Commonrelated Structures/1 (US$/m)	Syphon (US$/Nos)	Culvert (US$/Nos)	Bridge (US$/Nos)
0.3	59	8	12,000	2,000	2,000
0.5	86	13	15,000	2,000	3,000
1.0	124	19	19,000	3,000	3,000
1.5	146	24	26,000	6,000	5,000
2.0	162	26	38,000	8,000	7,000
3.0	184	30	46,000	10,000	9,000
4.0	199	33	58,000	13,000	11,000
5.0	212	35	68,000	15,000	12,000
6.0	222	37	79,000	16,000	13,000
7.0	230	38	90,000	17,000	14,000
8.0	237	40	100,000	18,000	14,000
9.0	244	41	110,000	19,000	15,000
10.0	249	42	120,000	20,000	16,000
15.0	271	46	165,000	23,000	18,000
20.0	287	49	209,000	25,000	19,000
25.0	299	50	248,000	27,000	21,000
30.0	309	53	289,000	28,000	22,000

Note: /1 Water controlling structures such as turnouts, check structures, spillways wasteways, etc. except syphons, culverts and bridges are included.

Table 15.47 (2) Basic Data on Cost Estimate of Project Works

Facilities of Tertiary System and Construction Cost

Description	Way Rarem Irrigation Project	Wonogiri Irrigation Project /2	Jatiluhur Irrigation Extension Project /2	Sadang Project	Adopted Value of the Project
Facilities (m/ha)					
1. Irrigation Canal					
Tertiary canal	35 /1	21	16	-	20
Quaternary canal	51	52	40	-	40
2. Drainage Canal					
Tertiary drain	21 /1	12	18	-	20
Quaternary drain	15	33	40	-	40
3. Farm Road					
Tertiary road	15	-	-	-	20
Field road	85	-	-	-	40
Construction Cost					
Construction cost per unit area (US$/ha)	602	674	155	200	250

Note: /1: Dual purpose canals are separately listed up in the items of irrigation and drainage canals.

/2: The operation roads of irrigation canals are designed so as to perform the function of farm roads.

Table 16.1 Economic Price of Rice in the Project Area

- Import substitution price -

(unit: Rp/t)

1.	International market price (FOB Bangkok) (Projected price to 1985 in 1978 constant dollars)	410 US$/t	256,250	
2.	External transportation cost (Bangkok - Ujung Pandang)	13 US$/t	8,125	264,375
3.	Handling charge & storing cost (including cost of sacks /1)		5,290	269,665
4.	Inland transportation cost (Ujung Pandang - Sengkang)		2,500	272,165
5.	Selling price of rice at ex-mill gate			272,165
6.	Conversion to the price of dry stalked paddy (0.52)			141,526
7.	Milling charge		6,000	135,526
8.	Local transportation cost		2,700	132,826
9.	Farm gate price of dry stalked paddy			132,826 =(133,000)

Note : /1 Handling charge at harbor 30 Rp/ton
Storing charge 7 Rp/ton/day x 180 days
Cost of sacks 4,000 Rp/ton
US$ 1 = Rp.625

Table 16.2 Average Market Price at the Main Markets of 4 Kabupatens (July 1977 - June 1978)

	Sidrap	Bone	Soppeng	Wajo	Average
Rice (Rp/kg)	107.8	118.6	113.6	117.2	114.3
Conversion to Dry Stalked Paddy	56.1	61.7	59.1	60.9	59.4
Maize	50.6	45.2	44.8	45.3	46.5
Peanut	252.5	260.1	246.2	242.3	250.3
Soybean	-	205.0	214.3	180.5	199.9
Green Kidney bean	241.9	212.6	210.5	187.8	213.2
Cassava	77.9	52.9	91.7	54.6	69.1
Sweet Potato	70.4	64.2	95.8	69.6	75.0
Average of Cassava and Sweet Potato/1	74.2	58.6	93.8	62.1	72.0 (36.0)

/1 : According to the results of field survey, the difference of the prices of cassava between the main Markets and local Markets was 50%, then farm gate price is estimated to 50% of the average of Main Markets in 4 Kabupatens.