Fig. 8-1-1 PLANTING SCHEDULE OF PADDY IN KIMUBU, PASIR MASS TO O THE STATE OF THE PLANTING

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Table 6-2-1(1) Reservoir Operation/Energy Porduction

L. W. I. = 50	AI PI	HA = 4	EMILETY Y TOWN ON THE TOWN OF THE TOWN	en e	and the Collegen was decision access up the ethic		
Item	HHL	50 π2/s	60 ㎡/s	70 m²/s	80 m²/s	90 m²/s	100 m²/
		128.98	141.07	153.87	164.99	165.91	167.88
÷	85	230.84	236.32	236.75	227.21	211.91	205.15
:		359.89	377.38	390.62	392.21	377.81	372.98
Energy		118.87	128.75	139.73	147.63	146.52	147.75
z.i.e.r.g.y	80	212.12	218.39	217.53	208.48	198.85	192.55
		331.01	347.14	357.27	356.13	345.37	340.30
(GWh)		108.1	115.67	124.22	127.71	128.23	127,74
	75	193.45	198.89	196.63	191.13	186.69	181.22
U : Dry		301.55	314.55	320.85	318.84	314.93	308.98
M : Wet		96.54	102.2	107.41	110.53	110.41	109.36
	70	173.64	177.91	175.9	173.31	172.13	168.08
L : Total		270.18	280.09	283.32	283.83	282.55	277.45
		93.15	110.98	127.65	139.68	139.91	139.7
	85	93.43	111.35	127.88	139.41	139.96	140.51
Power		94.0	112.8	131.6	150.4	169.2	188.0
		84.38	100.2	114.63	123.4	122.0	123.25
(HW)	80	84.71	100.6	114.83	123.0	123.5	127.83
		85.4	102.4	119.5	136.6	153.6	170.7
		75.48	88.9	100.43	105.72	106.48	106.25
U:Dry/Ave	75	75.91	89.5	100.66	106.71	110.96	114.5
•		76.7	92.1	107.4	122.8	138.1	153.5
M:Wet/Ave	<u></u>	66.45	78.15	85.41	90.3	91.48	90.5
L:Max.	70	67.0	77.3	87.11	93.06	99.5	101.95
	'0	68,1	81,7	95.4	109.0	122.6	136.2
		81.0	78.0	73.9	67.1	51.1	50.1
	85	84.5	84.1	83.4	81.5	77.5	74.4
· · · · · · · · · · · · · · · · · · ·		75.1	71.0	64.2	52.3	50.9	50.1
Water Level	80	79.5	79.0	78.1	75.8	72.4	70.4
(m)		68.2	62.5	52.6	50.5	50.1	50.2
	75	74.3	73.6	72.5	70.1	68.1	66.3
U : Min.		60 0	51.6	51.0	50.0	50.3	50.0

THL = 27.0m

L : Ave.

Legend: U = Upper Column

64.0

M = Middle Column

62.5

L = Lower Column

66.9

65.3

					Committee and some and address of the second second	Contract Con	
Item	OF NWL	50 m²/s	60 ਜੀ/s	70 m²/s	80 m²/s	90 m²/s	100 m²/s
	85	2.5644	2.0801	1.5545	0.9484	0.1867	0.1687
	(3.2958)	(0.7314)	(1.2157)	(1.7413)	(2.3474)	(3. 1091)	(3, 1271)
Power	80	1.7004	1.2665	0.7452	0.2149	0.1840	0.1680
	(2.392)	(0.6916)	(1.1255)	(1.6468)	(2.1771)	(2.208)	(2.224)
Discharge	75	1.0290	0.6408	0.2224	0.1752	0.1694	0.1712
	(1.6858)	(0.6568)	(1.045)	(1.4634)	(1.5106)	(1.5164)	(1.5146)
(10° m²)	70	0.4589	0.1970	0.1898	0.1675	0.1716	0.1672
	(1.177)	(0.6281)	(0.98)	(0.9872)	(1.0095)	(1.0054)	(1.0098)
Spilling	85	18.8	14.3	9.8	7.1	5.0	2.7
Water	80	19.0	14.2	10.4	7.3	5.4	3.7
(m2/s)	75	19.6	14.4	10.8	7.5	5.5	4.0
	70	19.9	14.7	11,3	8.2	6.2	4.5
	85	0	0	0	0	7	23
Months of	80	0	0	0	0	16	32
Generation	75	0	0	1	7	24	40
Stop	70	0	0	4	16	31	51
72 21.1	. 85	100	100	100	100	98.3	94.5
Possible Generating	0.0	100	100	100	100	96.2	92.4
Hours (%)	75	100	100	99.8	98.3	94.3	90.5
10020 (707	70	100	100	99.0	96.2	92.6	87.9

* Number of Months in percentage

Taking m (months) = number of months with generation stop,

Possible Generating = 35×12-m

Hours 100

Table 6-2-1(2) Reservoir Operation/Energy Porduction

L.W.L. 50	The state of the s	HA = 5					
Item	NHL	50 m²/s	60 m²/s	70 π2/s	80 π₹/s	90 m²/s	100 ㎡/s
		129.16	141.07	153.87	164.99	165.91	167.83
. ,	85	248.85	251.25	249.13	236.51	248.99	209.32
		377.84	392.30	403.00	401.51	384.88	377.16
Energy		119.01	128.75	139.73	147.63	146.52	148.84
	80	229.47	231.65	229.65	217.09	206.11	200.25
		348.48	360.41	369.39	364.73	352.66	349.09
(GWh)		108.23	115.67	124.22	127.71	128.23	127.74
	75	208.72	210.9	207.6	199.2	193.29	185.99
U: Dry		316.94	326.55	331.83	326.91	321.52	313.74
M : Wet		96.67	102.2	107.41	110.53	110.41	109.36
L : Total	70	187.44	188.78	185,73	181.17	178.98	173.34
L. IUCAI		284.10	290.96	293.16	291.68	289.4	282.69
		116.4	138.73	159.55	174.56	174.9	174.61
	85	116.8	139.15	159.81	174.3	174.96	175.65
Power		117.5	141.0	164.5	188.0	211.5	235.0
·		105.51	125.26	143,26	154.25	152.51	154.36
(H₩)	80	105.91	125.73	143.53	153.73	154.36	160.03
		106.7	128.0	149.4	170.7	192.1	213.4
		94.35	111.18	125,56	131.5	133.13	132.81
U:Dry/Ave	75	94.88	111.86	125.81	133.38	138.63	143.1
M:Wet/Ave		95.9	115.1	134.3	153.5	172.7	191.8
		83.08	96.6	106.78	112.86	114.36	113.15
L:Max.	70	83.76	97.71	108.93	116.33	124.38	127.4
		85.1	102.2	119.2	136.2	153.2	170.3
1.0	85	81.0	78.0	73.9	67.1	51.1	50.1
	. 00	84.5	84.1	83,4	81.5	77.5	74.4
Water	80	75.1	71.0	64.2	52.3	51.1	51.4
Level	ου	79.5	79.0	78.1	75.8	72.4	70.5
(m __)	75	68.2	62.5	61.0	50.5	50.1	50.2
	(3)	74.3	73.6	72.5	70.1	68.1	66.3
U: Min.	70	60.9	51.6	51.2	50.4	50.3	50.0
L : Ave.	10	69.2	68.2	66.9	65.3	64.0	62.5

TWL = 27.0m

Legend: U = Upper Column

M = Middle Column

	9 0.1872 2 0.1694 3 0.1726 .9 3.3 .0 3.5	2.2
5537 0.1753 1898 0.1743 6.9 4. 7.2 5.	2 0.1694 3 0.1726 .9 3.3 .0 3.5	0.1712 0.1672 1.7 2.2
1898 0.1743 6.9 4. 7.2 5.	3 0.1726 .9 3.3 .0 3.5	0.1672 1.7 2.2
6.9 4. 7.2. 5.	.9 3.3 .0 3.5	1.7
7.2 5.	.0 3.5	2.2
7.6 5.	-	
	.2 3.6	2.5
8.0 5.	.6 3.9	2.7
0 0	7	23
0 0	16	32
1 7	24	39
4 16	32	51
		:
	0 0	0 0 16 1 7 24

Table 6-2-1(3) Reservoir Operation/Energy Porduction

L. W. L. = 50 ALPHA = 6

M. L. = 50	ALPHA	2 D					
ltem	NMF	50 m2/s	60 m²/s	70 m2/s	80 m/s	90 m/s	100 m²/s
		129.16	141.07	153.87	164.99	165.91	167.83
	85	262.02	262.77	257.03	242.31	221.38	209.59
, i		391.18	403.83	410.89	407.31	387.26	377.43
Energy		119.0	128.75	139.73	147.63	146.52	147.75
Ducigy	80	240.54	241.57	237.45	222.51	208.5	197.88
		359.54	370.33	377.19	370.15	355.03	345.64
(GWh)		108.23	115.67	124.22	127.71	128.23	128.53
	75	219.81	219.91	215.3	204.29	195.61	188.18
U : Dry		328.05	335.56	339.51	332.00	323.83	316.69
M : Wet		96.67	102.2	107.41	186.3	110.41	109.36
	70	197.46	196.85	192.73	110.53	181.61	173.85
L : Total		294.12	299.04	300.15	296.81	292.02	283.21
		139.68	166.46	191.46	209.5	209.88	209.56
4 5	85	140.13	166.98	191.8	209.16	209.93	210.76
Power		141.0	169.2	197.4	225.6	253.8	282.0
		126.55	150.3	171.93	185.13	183.0	184.83
(HH)	80	127.08	150.9	172.25	184.46	185.23	191.76
		128.0	153.6	. 179.3	204.9	230.5	256.1
		113.23	133.43	150.68	157.8	159.75	159.38
U:Dry/Ave	75	113.86	134.23	150.96	160.06	166.38	171.83
		115.1	138.1	161.1	184.2	207.2	230.2
M:Wet/Ave		99.71	117.25	128.15	135.45	137.23	135.76
L:Max.	70	100.53	115.98	130.7	139.56	149.25	152.86
		102.2	122.6	143.0	163.5	183.9	204.3
	85	81.0	78.0	73.9	67.1	51.1	50.1
		84.5	84.1	83.4	81.5	77.5	74.4
1744.50	80	75.1	71.0	64.2	52.3	50.9	50.1
Water Level		79.5	79.0	78.1	75.8	72.4	70.4
(m)	75	68.2	62.5		51.3	50.1	50.2
·		74.3	73.6	72.5	70.1	68.1	66.3
U: Min.	70	60.9	51.6	51.2	50.0	50.3	50.1
L : Ave.			68.2	66.9	65.3	64.0	62.5
	= 27 On			· · · · · · · · · · · · · · · · · · ·			

TWL = 27.0m

Legend: U = Upper Column

M = Middle Column

NML 85 2.5644 2.0801 1.5545 0.9484 0.1867 0.1687 Power Discharge (2.392) 1.7004 1.2665 0.7452 0.2149 0.1840 0.1680 (109 m²) (1.6858) 1.0290 0.6408 0.5537 0.1914 0.1694 0.1712 (109 m²) (1.177) 0.5489 0.1970 0.1898 0.1675 0.1716 0.1693 Spilling 85 11.4 8.0 5.0 3.5 2.8 1.0990 Water 80 11.6 8.1 5.1 3.6 2.9 2.090 (m²/s) 75 11.9 8.3 5.3 3.7 2.9 2.090 (m²/s) 75 11.9 8.3 5.3 3.7 2.9 2.090 Contact 1.5545 0.9484 0.1867 0.1687 O.1687 0.1687 0.1687 O.1687 0.168							
NHL SO M.78							
Power Discharge (3.2958) 2.5644 2.0801 1.5545 0.9484 0.1867 0.1687	T+om	50 π²/s	60 m/s	70 m²/s	80 m²/s	90 m²/s	100 ਜੀ/
Discharge (2.392) 1.7004 1.2003 0.7432 0.2149 0.1840 0.1600 755 (1.6858) 1.0290 0.6408 0.5537 0.1914 0.1694 0.1712 (109 ml) 70 0.5489 0.1970 0.1898 0.1675 0.1716 0.1693 (1.177) 0.5489 0.1970 0.1898 0.1675 0.1716 0.1693 0.1693 0.1675 0.1716 0.1693 0.1693 0.1675 0.1716 0.1693 0.1693 0.1693 0.1675 0.1716 0.1693 0.1693 0.1675 0.1716 0.1693 0.1693 0.1693 0.1675 0.1716 0.1693 0.1693 0.1693 0.1675 0.1716 0.1693	85	2.5644	2.0801	1.5545	0.9484	0.1867	0.1687
(10° m²) (1.6858) (1.0290 (0.0408) (0.337 (0.1914) (0.1694) (0.1712) (1.0° m²) (1.177) (0.5489) (0.1970 (0.1898) (0.1675) (0.1716) (0.1693) (1.177) (1		1.7004	1.2665	0.7452	0.2149	0.1840	0.1680
Spilling 85 11.4 8.0 5.0 3.5 2.8 1. Water 80 11.6 8.1 5.1 3.6 2.9 2. (m/s) 75 11.9 8.3 5.3 3.7 2.9 2. 70 12.1 8.5 5.7 3.9 3.0 2. Months of 80 0 0 0 0 7 23 Generat's 75 0 0 1 7 24 40	l f	1.0290	0.6408	0.5537	0.1914	0.1694	0.1712
Water 80 11.6 8.1 5.1 3.6 2.9 2. (m/s) 75 11.9 8.3 5.3 3.7 2.9 2. 70 12.1 8.5 5.7 3.9 3.0 2. Months of Generatin 80 0 0 0 0 7 23 Generatin 75 0 0 1 7 24 40	1 (0.5489	0.1970	0.1898	0.1675	0.1716	0.1693
Water 80 11.6 8.1 5.1 3.6 2.9 2. (m/s) 75 11.9 8.3 5.3 3.7 2.9 2. 70 12.1 8.5 5.7 3.9 3.0 2. Months of Generatin 80 0 0 0 0 16 32 Generatin 75 0 0 1 7 24 40	Spilling 85	11.4	8.0		3.5	2.8	1.
70 12.1 8.5 5.7 3.9 3.0 2. 85 0 0 0 0 7 23 Months of Generatin 75 0 0 0 0 16 32 Generatin 75 0 0 1 7 24 40		11.6				2.9	2.
Months of Generat in 85 0 0 0 0 7 23 Months of Generat in 80 0 0 0 0 16 32 Generat in 75 0 0 1 7 24 40	(元/8) 75	11.9	8.3		3.7	2.9	The second secon
Months of Generat in 75 80 0 0 0 0 16 32 To Generat in 75 0 0 1 7 24 40	1						
Generat'n 75 0 0 1 7 24 40					 _ _ 		
Stop 70 0 0 4 16 33 51	1 1						
	Stop 70		0	4	16	33	51

Table 6-2-1(4) Reservoir Operation/Energy Porduction

L.W. L. = 60 ALPHA = 4

W.L. = 60	ALPHA	# 4		A COMPANY AND A STATE OF THE ST			
Item	NAT	50 ㎡/s	60 m/s	70 m²/s	80 m/s	90 m²/s	100 m²/s
							~~~
	85						
					404.0	·	
Energy	20				124.8	·	na na productiva in communicati
	80			<u> </u>	211.34	The second se	
/AIIL\				08.71	359.19	***************************************	
(GWh)	•r			20.71	149.68	<del></del>	
	75			32.92	174.06		
U : Dry			40.00	321.79	323.75		
M : Wet			16.98	18.21			
L : Total	70		29.65	34.20			<u> </u>
<u></u>			279.77	314.45			<u> </u>
							ļ
	85						
Power							
:			<u> </u>		123.1		ļ
(HH)	80			_ i	123.3		
		:			136.6		
				100.4	106.95		
U:Dry/Ave	75			100.7	108.88		
M:Wet/Ave				107.4	122.8		
			77.1	84.7			
L:Max	70		78.2	89.5			
			81.7	107.5			
	85						
•	υý						
Materia	9.0				60.7		
Water Level	80				76.0		
(m)	70			61.6	60.5		
	75			72.6	71.1		
U : Min.	70		61.1	60.3			
L : Ave.	70		68.3	67.9			

THL = 27.0

Legend: U = Upper Column

M = Middle Column

Item	Of NHL	50 m/s	60 π2/s	70 n2/s	80 m²/s	90 ㎡/s	100 m²/s
	85						
Power	80				0.5408		·
Discharge	(2.392)				(1.8512)	L	
	75			0.5836	0.5274		
	(1.6858)			(1.1022)	(1.1584)		
(10° m2)	70		0.5600	0.5158			
	(1.177)		(0.617)	(0.6612)			
Spilling	85					.,	
Water	80				7.5		
(m/s)	75			11.2	7.7		
	70		15.0	4.8			
	85		٠.				
Months of	80				4		
Generat 'n	75			99.3%			
Stop	75			3	11	· .	<u> </u>
	70		99.5%	96.9%			
	10		2	13			

Table 6-2-1(5) Reservoir Operation/Energy Porduction

L.	W.L.	93	60	•	ALPHA	28	5

W. L. * 60	ALPHA	<i>a</i> 5	A ALVANOR AND A MARK TO A STATE OF THE STATE				
Item	NAT	50 <i>π</i> 2/s	60 m²/s	70 nt/s	80 m²/s	90 π⁄s	100 m²/s
	85			•			
Energy					147.86		
	80				221.32	******	-
(GWh)				20.71	369.19	<del></del>	
(unit)	75			34.84			
U: Dry	10			333.31	•		
M : Wet			16.98	17.92		——————————————————————————————————————	
L : Total	70		31.53	35.10			
L . TOLAT			291.06	318.13			
_ %	85						
Power	wer				450.05		
7 1915	80				153.85 154.15		
(HM)	٥v				170.7		
		4		125.4	133.72	<u> </u>	
U:Dry/Ave	75			125.9	136.08		
-				134.3	153.5		
M:Wet/Ave			96.4	105.5			
L:Max.	70		97.7	111.0			
			102.2	120.1			
	85						
Water	80				:		
Level		····		61.5		<del> </del>	<b></b>
( m )	75			72.6		·	
U : Min.			60.9	60.3			
L : Ave.	70	<del></del>	68.3	67.7			

THL = 27.0m

Legen · U = Upper Column

M = Middle Column

Item	NAT OL	50 ㎡/s	60 π³/s	70 m2/s	80 m²/s	90 m2/s	100 m²/s
	85				1		
Power Discharge	80						
	75 (1.6858)			0.5836 (1.1022)			
(10° m²)	70 (1.177)		0.5600 (0.617)	0.5157 (0.6612)			
Spilling	85						
Water .	80	•			İ		
(m/s)	75			7.8			
	70		11.3	3.0		<u>.                                      </u>	
	85						
Months of	80				_		
Generat n	75			3			
Stop	70		2	13			

Table 6-2-1(6) Reservoir Operation/Energy Porduction

	L. W.	L. = 60	ALPHA = 6
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W. L. = 60	ALPHA	* 0					NAMES AND ASSOCIATION OF PERSONS ASSOCIATION OFFICIATION OF PERSONS ASSOCIATION OFFICIATION OFFICIATION OFFICIATION OFFICIATION OFFICIATI
Item	NHL	50 m²/s	60 nt/s	70 m2/s	80 <i>न्हे</i> /s	90 m/s	100 ㎡/s
	'						Andrews With Bernstein
	85						
				·	447.00	· · · · · · · · · · · · · · · · · · ·	
Energy	00				147.86		
	80				227.15 375.00		
(GWh)				20.71	3/3.00		
(unit)	75			36.31			
17 - 10				342.12			
U : Dry M : Wet	!		16.98	17.89			
	70		32.94	35, 34		<del></del>	
L : Total			299.56	319.37		د حي رسيسين ففي پيوند	
						<del></del>	
	85						
Power							<del> </del>
,*					184.62		
( אא )	80				184.95		
					204.9		
·				150.5	160.43		
U:Dry/Ave	75			151.0	163.32		
M:Wet/Ave				161.1	184.2		
			115.7	110.0			
L:Max.	70		117.2	118.9			
			122.6	122.6		-	
	85						
							<u> </u>
Water	80						
Level				04.0			
(m)	75			61.6			
U : Min.			20.0	72.6			
L : Ave.	70		60.9	60.3	· · · · · · · · · · · · · · · · · · ·		
L : Ave.		<u> </u>	68.3	67.6			

THL = 27.0 m

Legend: U = Upper Column

M = Middle Column

	Item	NHL	50 m²/s	60 m²/s	70 m³/s	80 m³/s	90 m²/s	100 m²/s
		85						:
	Power Discharge	80						
		75 (1.6858)	nama ya giliminin sana sa 1944 <del>a ili makee 1944 Cili ma</del>		0.5836 (1.1022)		The Control of the Co	
	(10° m²)	70		0.5600 (0.617)	0.5155 (0.6615)			·
	Spilling Water	85 80						
(元/s)	75 70		8.5	5.2 2.2				
		85						
:	Months of Generat in Stop	80						
		75			3			:
į		70		2	96.4% 13			

Table 6-2-1(7) Reservoir Operation/Energy Porduction

Energy 80 24.30 35.70 360.01 (GWh) 75 U: Dry M: Wet L: Total 70 30.60 280.70 Power (HW) 80 124.1 136.6 U: Dry/Ave L: Max. 70 79.3 3 131.7 85 Water Level (m) 75 U: Min. L: Ave. 70 66.1 L: Ave. 70 66.1 L: Ave. 70 66.9	Item	NHL OF	50 m/s	60 m²/s	70 π/s	80 π∂/s	90 m³/s	100 m³/s
So   35.70   360.01		85					iki ang katang pangkan dan pangkan pan Pangkan pangkan pangka Pangkan pangkan pangka	
(GWh)     75       U: Dry     16.18       M: Wet     280.70       L: Total     280.70       85     122.1       (HW)     80     124.1       U:Dry/Ave     75     136.6       M: Wet /Ave     73.3     136.6       L: Max.     70     79.3       Water     85     65.1       Level     76.3     76.3       U: Min.     70     66.1	Energy	80				35.70		
U: Dry M: Wet L: Total 70 30.60 280.70  85  Power (HH) 80 122.1 (11.11 136.6  U:Dry/Ave H: Wet/Ave L: Max. 70 75 85  Water Level (m) 75 U: Min. 70 66.1	(GWh)	75				360.01		
M: Wet L: Total 70 30.60 280.70  Power (HW) 80 122.1 U:Dry/Ave M: Wet/Ave L: Max. 70 75 85 Water Level (m) 75 U: Min. 70 66.1	U: Dry							
Power  (HH)  80  122.1  124.1  136.6  U:Dry/Ave  M:Wet/Ave L:Max.  70  73.3  85  80  81.7  85  Water Level (m)  75  U:Min.  70  66.1	M : Wet	70		30.60			:	
(HW)     80     122.1       U:Dry/Ave     75     136.6       M:Wet/Ave     73.3     124.1       L:Max.     70     79.3       Water     85     65.1       Level     76.3     76.3       U:Min.     70     66.1	Power	85		280.70				
M:Wet/Ave L:Max.  70  73.3  85  85  Water Level (m)  75  U:Min.  70  66.1		80				124.1		
L:Max. 70 79.3 81.7 85 85 85 65.1 80 65.1 76.3 76.3 75 U:Min. 70 66.1		75						
Water Level (m) 75 66.1	1 1	70		79.3				
Water Level (m) 75 76.3 U:'Min. 70 66.1		85						
(m) 75 U: Min. 70 66.1		80				Control of the Contro		
70   00.1		75						
		70						

TWL = 27.0 m

Legend: U = Upper Column

M = Middle Column

Item	NAF	50 m2/s	60 m²/s	70 m²/s	80 <i>π</i> ₹/s	90 m²/s	100 m₹/s
	85						
Power Discharge	80 (2.392)	Andready growing the Address county of the			0.8024 (1.5896)		
	75						
(10° m²)	70		0.8722 (0.8136)				
Spilling	85						
Water	80				7.3		
( nd/s )	75						
	70		15.7				
	85				·		
Months of Generatin Stop	80				99.0% 4		
	75		•			:	
	70		96.2% 16				

Table 6-2-1(8) Reservoir Operation/Energy Porduction

Item	Qf NWL	50 m²/s	60 ਜਟੋ/s	70 π²/s	80 m/s	90 m/s	100 ਜੀ/8
	85						
Energy	80	Allen and the state of the stat			24.30 37.14		
	00				368.61		
(GWh)	75						
U : Dry			40.40				
M : Wet L : Total	-70		16.18 32.60				
L . IOCAI			292.70				
Power	85						
(HW)	80				152.65 155.17		
(1111)	80				170.17		
U:Dry/Ave	75						
M:Wet/Ave L:Max.	<b>.</b>		91.6				
wallan.	70		99.1 102.2		* <del></del>		
	85				The state of the s		
Water	80				65.1		
Level (m)	75				76.3		

TWL = 27.0m

U: Min.

L : Ave.

Legend: U = Upper Column

M = Middle Column

L = Lower Column

66.1

68.9

Item	Of NHL	50 m2/s	60 n₹/s	70 m2/s	80 स्ट्रें/इ	90 m/s	100 æ/s
	85			,			
Power Discharge	80 (2.3920)	<u> </u>			0.8024 (1.5896)		
	75						
(10° m²)	70		0.8010 (0.9690)			ddiridau ac canga y llife da Alberta ac can	
Spilling	85						
Water	80				5.0		
( n / s )	75						
	70		11.8				
	85						
Months of Generatin	80				8		
	75						
Stop	70		16				

Table 6-2-1(9) Reservoir Operation/Energy Porduction

Item	NMT OL	50 ਜ਼ੋ/s	60 ਜੀ/s	70 m2/s	80 m/s	90 m2/s	100 m²/s
						<del></del>	
	85						
						~~~	
Energy	}				24.30		
_,	80				38.04		
					374.03		
(GWh)						~~	
	75					-	
U: Dry							
M : Wet			16.18			****	
L : Total	70		34.06				
			301.46				
.	85						
Power					400 47		
71013					183.17		
(HW)	80				186.22		
					204.9		
	70						
U:Dry/Ave	75					·	
M:Wet/Ave			109.97				
L:Max.	70		118.92				
No.	10		110.34				

122.6

65.1

68,9

TWL = 27.0m

85

80

75

70

Water

Level (m)

U: Min.

L : Ave.

Legend: U = Upper Column

61.5

76.3

M = Middle Column

Item	NAT	50 m²/s	60 m²/s	70 ㎡/s	80 m²/s	90 n2/s	100 元/s
	85						
Power	- 80				0.8024		
Discharge	(2.3920)				(1.5896)		
	75			!			
(10° m²)	70		0.2722				
	(1.177)		(0.8978)				i
Spilling	85						
Water .	80				3.6		
(R/S)	75						
	70		8.9			·	
	85						
Months of	80		`		7		
Generat in	75						
Stop	70		19.				

Table 6-2-1(10) Reservoir Operation/Energy Porduction

1	U I	22	60.61	A	LPHA	·	A	
L.	. H. L.		00.01	ĸ	LYNA	**	45	

.W.L.= 60,61	ALPI	HA = 4		and the face of the same of th			
Item	NMF	50 m²/s	60 m²/s	70 m2/s	80 m²/s	90 m2/s	100 m/s
	,			and all the control of the Control o		167.85	
	85					219.79	
.	LWL 60					387.64	·
Energy					146.63		
Duergy	80			7-7-10-10-10-10-10-10-10-10-10-10-10-10-10-	211.82		
	LWL 61				358.44		
(GHP)	00					: .	
	80						
U: Dry	LHT 60						
M : Wet							
L : Total	70						
2							
	85					140.9	
	LHF 60					142.5	
Power	נאנ טט					169.2	<u> </u>
•	80				122.8		
(HH)	LWL 61				123.4		
					136.6		
U:Dry/Ave	75			, , , , , , , , , , , , , , , , , , , ,			
M:Wet/Ave							
L:Max.							<u> </u>
2000000	70		·				
	- 25	<u> </u>				00.7	
j	85				· · · · · · · · · · · · · · · · · · ·	60.7	<u> </u>
*	FMT 60				04.0	78.3	
Water	80				61.3		ļ
Level	LWL 61				76.1		<u> </u>
(m)	75						
U : Min.							<u> </u>
L : Ave.	70						
A . WAE.							<u> </u>

THL = 27.0m

Legend: U = Upper Column

M = Middle Column

Item	NAF	50 m²/s	60 m²/s	70 m2/s	80 m²/s	90 m2/s	100 m2/
т <u>ы былышын сашкалықтарын</u> Антиска (1947)	85 LWL 60					0.5373 (2.7585)	
Power Discharge	80				0.5732 (1.8188)		, <u>, , , , , , , , , , , , , , , , , , </u>
	75	- 14-1-1					
(10° m²)	70			ang			
	85 LWL 60					4.7	
Spilling Water	80 LWL 61				7.3		•
(m/s)	75						
	70						
	85 LWL 60					97.1% 12	
Months of Generatin	80 LWL 61				98.8% 5	-	·
Stop	75			. :			
	70						

Table 6-2-1(11) Reservoir Operation/Energy Porduction

L. W. L. = 60.61 ALPHA = 5

W.L.≈ 60.0	ALPHA	=)				Table	
Item	HAT OF	50 m²/s	60 m²/s	70 m²/s	80 m³/s	90 m/s	100 æ∕s
	85			:		167.86	
•	60 LWL					226.99	
	LAL DO					394.84	
Energy	80				146.63		
	LWL 61	:			220.43		
	THE OI				367.05		
(GMp)						more de la companya d	
j	75			<u> </u>			
U: Dry							
M : Wet						***	
L : Total	70						
	85	:				176.2	
_	LWL 60			· : · · · : · ·		178.18	
Power		:				211.5	
	80				153.5		
(HH)	LWL 61				154.2		<u> </u>
:			· · · · · · · · · · · · · · · · · · ·		170.7		
U:Dry/Ave	75						
M:Wet/Ave				• • •			<u> </u>
L:Max.							
	70						
	85					60.7	
	TMF 60					78.3	
Water	80				61.3		<u> </u>
Level	LWL 61				76.1		<u> </u>
(m)	75						
V : Min.							ļ
L : Ave.	70						
n . Ave.							

THL = 27.0m

Legend: U = Upper Column

M = Middle Column

Item	MAF	50 nd/s	60 n₹/s	70 nt/s	80 m/s	90 m²/s	100 m2/s
The state of the s	85 LWL 60			ing ang ang ang ang ang ang ang ang ang a		0.5373 (2.7585)	
Power Discharge	80				0.5732 (1.8188)		
	75						
(10° m²)	70			oom, mayaa, mayaa, <u>aa a</u> addii dhii dhadh ada	am kapamigang ang AMASTA ASSA (A makas Mas		
	85 LHL 60					3.0	
Spilling Water	80 LWL 61	·			5.0		
(元/s)	75			· ·			
	70						
· <u>·</u>	85 LWL 60					11	, i s
Months of	80 LWL 61				5		
Generat 'n Stop	75						
*. ·	70						

Occurrence of Ten Days Interval with the Remaining Discharge Less than 85/100 CMS Table 8-1

Irrigable	Water	Discharge	March	March	March		April			July	~	Sep.
Area	Release	Reserved	1-10	11-20	21-31	1-10	11-20	21-30	1-10	21-31	11-20	21-30
Case I	O CMS	85 t/s	· 1	1	ı		2/17			1		1
(46,800 ha)	0 CMS	100 t/s	1	ţ	3/16		3/17	1		1		1
Case II	0	85	: 1	ŀ	2/16		3/17			1		1
(54,250 ha)	0	100	i	i	3/16		3/17			ı		ı
Case II	70	85	ł	ļ	i		ı			ŀ		i
(54,250 ha)	70	100	1.	ı	1		i			ı		ı
Case II	80	85	i	1	ı		1			ı		1
(54,250 ha)	80	100		1	1	. [ı	- 1	-	- 1	+
Case III	0	85	.	1/17	4/16		2/17			l		ı
(78,826 ha)	0	100	1	1./17	4/16		3/17			1/17		1/17
Case III	20	85		1	Į		1/17			1		1
(78,826 ha)	20	100	1	1 -	ŧ		3/17			ı		- 1
Case III	80	85	i	ı	ı		1/17			ι		: 1
(78,826 ha)	80	100	. 1	Į.	1	ŀ	1/17	ì	- 1	ŧ		1
Case IV	0	85	ı	ı	3/16		3/17			1		1
(65,326 ha)	0	100	I.	1/17	3/16		3/17			į		ı
Case IV	70	85	. 1	ı	ı		1/17			ı		į
(65,326 ha)	70	100	1	i	ı		1/17			i		i
Case IV	80	85	ı	ı	ì		1/17			ı		1
(65,326 ha)	80	100	-		1	- [1/17	- 1	- [-		•

Note: 1. 3/16: three times/16 years

Discharge data of Kelantan river is obtained at 18 years from 1967 to 1984 at Guillemard bridge. 16 years or 17 years are not included years with lack of data. 2.

Table '8-1'1 Occurrence of Ten Days Interval with the Remaining Discharge Less than 85/100 CMS

(Unit: MCM)

Note: Figures in parenthesis show thoses revised roughly considering the water requirement by Kemasin-Semerak and the difference of river discharge between Gillmerd and Kemubu.

Reserved MG 85.t/s N	Month P	1-10 11-20 21-31	1967 1968	196	1970 n.a n.a	1971 1972	<u>72</u> 1973	1974	1975	1976	1977 1	1978 19 19 10, a	1979 1980	1981	1982	1983
1 25	Apr.	1-10 11-20 21-30		12.20 (31.29) (31.29) 7.01		n.a	4									40.19 (55.14) 45.05 (57.17)
	Mar.	1-10 11-20 21-31		51.70	E E E							e. a		64.41	1 77.71	
	Apr.	1-10	53.77 (73.75) \$1.26 (69.59)	31.	а. п е. п											1
1 1	Mar.	21-30 1-10 11-20 21-31		7.01 (23.06) (23.09) (58.37)	n.a n.a n.a	d E	ra .					n,a		\$2.53 (70.77)	3.5	45.05
	Apr.	1-10	40.52 (61.08) 39.01 (57.87)	-0. (19.	a a a	ห. _. น	ದ		·							35,76 (53,93) 27,98 (45,34) 36,55 (48,84)
	May	1-10		49.90 (57.73)		n.a	æ							٠.		

Case II 70 100 Apr. 21-30 (71.03) Case II 80 Apr. 21-30 (71.03) Case II 80 Apr. 1-10 (71.03) Case II 80 Apr. 1-10 (53.67) Case II 80 Apr. 1-10 (53.67)	Case Case II	Release 70	Discharge Reserved 85	Month	Period	1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1984 1984 1985 1985 1984 1985 1984 1985 1985 1984 1985 1985 1985 1985 1985 1985 1985 1985	1984
70 100 Apr. 1-10 11-20 21-30 21-30 or 11-20 No-occurrer Apr. 21-30 Apr. 21-30 (31) 21-20 21-30				or Apr.	11-20 21-30 (31)		
80 85 Mar. 1-10 or 11-20 No-occurrer Apr. 21-30 (31) 80 100 Apr. 1-10 11-20 21-30	Case II	70	100	Apr.	1-10 11-20 21-30		:
80 100 Apr. 1-10 11-20 21-30	Case II	80	85	Mar. or Apr.	1-10 11-20 21-30 (31)	No-occurren	
	Case II	90	100	Apr.	11-20		
		•					

Continue

3																			
Case. Release	Reserved	Month	Period	1967	1968	1969:	1970	1971 1972	72 1973	1974	1575	1976	1577	1978	1979 1980	1981	1982	1983	1984
Case II 0 CMS	100 1/3	Mar.	1-10				n. 2			4						-			
			11-20				a - u									64.69	. 5		
			21-31		ا	39.09	n.a							п.а		(70.77)	72.43		
		Apr.	1-10		.40,52		п.я											35.76 (53.93)	
			13-20		39,01 -0.51 (57,87)(19,14)	-0.51 19.14)	H. H											29.98	
			21-30)	-3.87	n, 2	n.a	₽.					,				36.52 (48.84)	
		Мау	1-10)	49.90		п. г	ne	. 1			74.51						
Case III 0 CMS	\$ 85 1/5	Mar.	1-30				1.												
			11-20	÷ , -													47.99 (56.98)		
			21-31			7.17 (25.96)	4.6							7.2		21.40	21.40 54.89 57.95 (66.45)(63.47)(74.22)	57.95	
		Apr.	1-10		6.98 48.17 (25.76)(61.46)	48.17	n.a					34.79						5.79	
			11-20		8.01 -13.54 (26.18) (32.68)	13.54	e .	٠		٠							• .	4.14 (19.15)	•
			21-30	ŧ	10	-15.50	명 : :	# # # # # # # # # # # # # # # # # # #	7			-			:			15.03	
1 1 ₂ :			3-30			21.02						45.72							
Case III 0 CMS	S 100 t/s	Zar.	3-10				# · E												
			11-20				¥.5								-		47.98 (56:98)		
·			21-31		÷.	7.17		•		· .		. :		a . a		21.40	21.40 54.89 57.9S (66.47)(63.47)(74.22)	\$7.95 (74.22)	
	:	Apr.	1-10		6,98 48.17 (26,76) (61.46)	48.17	n.a					34.79 (54.96)						5.79	
	· ·		11-20		8.01 -13.54 (26.18) (32.68)	13.54				. •								4.14 (19.13)	
			21-30			-15.5)	46.44	٠				15.03	
											,								

V.
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z,

Case Release Reserved Case III 0 CMS 100 t/s																		
3	d Month	당	Period 1	1967	1968	1969 1970	1971	1	1973	1974	1875 1	1976	1977 1978 1979	1979	1980	1981	1932	1983 1984
	N Ray		11-20	,	4	70.1		# #				Į.	7/.					
: :		21-	21-30					E.										
:: • \$	Jul.		1-10				u.	n. a		n.a								
:		Ħ	11-20				n.2											
٠		21.	21-31		, ()	76.56	n:a				n.#					·		
	Aug.		1-10				e . E						i.					
		ä	11-20			•	e e									(74.45)	•	
		21.	21-31				E.					1						:
	Sep.	1	1-10															
			11-20		•													
		22	21-30													57.98		
Case III 70 OMS 85 t/s	s Har.		1-10			a.n	a 1.											
		11.	31-20			n. n	4	•										
		21-31	31			1. E	-						n.a					
	Apr.		1-10			# 1												
	-	ii	11-20		, <u>2</u>	. 24, 16 n.a (45, 30)	n											
		21-	21-30		. 4.2	27.17 n.a (43.07)	· es		# :									
•	May		1-10		9	67.83			й. Я									
Case III 70 CMS 100 t/s	s Max.		1-10			# r.	aŧ										_	55.32 (73.00)
		1	11-20			£.	#			•							_	57.40 (72,39)
		. 21-	21-31			e: E:	-						Ę.					69.24
	Apr.	1	1-10	" "	\$3,32 (73,36)	a.e	, al											
		Ϊ	11-20	* C	56.17 24.16 (73.43)(43.30)	4.16 n.a 3.30)	r a					•						
		21-	21-30		2.4	27.17 n.º2 (43.07)	al	,	8.4									
	May	y 1-10	-30		9	67.83			a								- 1	

٠
,
ŕ

1967 1968 1969 1970 1971 1972 1973 1974 1975	1976 1977 1978 1979 1980 1981 1982						n.a. 39.53,64.42 (57.54) (73.08)					61.53	57.71	.4.' (66.79) 39.53 64.52 (57.54) (73.08)	
32.80 32.80 51.94) 35.81 (51.71) 35.81 (44.67) (44.69) 26.70 (44.69) 26.24 -13.7((44.69) 26.24 -13.7((44.69) 26.24 -13.7((44.69) 26.70 (44.69)	71 1972 1973 1974 1975			•	• tt • £					n.a.		n.a.			
	1968 1969 1970 19		11.8.	32.80 m.s.	.51.94) 35.81 n.a. (51.71)		25.94 (44.67)		26.24 -13.76 n.a.	(44.57) (9.34) -15.21 n.a.	(0.65)	38.00	. u . u		26.70 (44.69) 26.24 -13.76
Month i Apr Apr Apr Apr	onth Petiod	21-30	Apr 1-10	11-20	21-30	Mar 110 11-20	21-31	4	11-20	21-30	. :	Мау 1-10	ar 1- 10 .11-20	21-31	1

	Ð	
	ä	
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	ij.	
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No.6

Case Muter Release	Discharge Reserved		Month Period	1967 1968 1969	8 1969	1970 1971 1972 1973 1974 1975	1 1972 1	973 1974	1975 19	76 1977 197	8 1979 1980 198	1976 1977 1978 1979 1980 1981 1982 1983 1984
CaselV 0 CMS 100 t/s	100 t/s	Apr	21-30	!	-15.21 n.a. (0.65)	ц ,	ц ц			62.10 (77.15)		27.68 (39.61)
(continue)		May	1-10		38.00 n.a.	et et				61.53		
					-	Ž.				•		
CaseIV 70 CMS	s 85t/s	Apr	1- 10		43.08	n.a. n.a.		•				
			21-30		(62.18) 43.36 (59.22)	n.	n.a.					
Casel V 70 CMS	s 100t/s	Apr	1- 10		43-08	n.a. n.a.		٠				
<u></u>			. 21-30		(62.18) 43.36 (59.22)		:: :::				•	
33						`,						
CaselV 80 CMS	85t/s	Apr	Apr 1- 10 11-20	•	51.72	п. в. г.					• •	
			21-30		(70.82) . 52.00° (67.89)	e :	ដ ដ					
Casely 80 CMS 100 t/s	5 100 t/s	Apr	1- 10		51-72	4 4 4 4		•				
			21-30		(70.82) .S2.00 (67.89)	ਹ ਵ	4	,		•		
•							÷					

The Planted, Harvested and Damaged Area of Paddy for Main Season in Kelantan Province, 1970/71 to 1984/85 Table 8-2

(unit: ha)

		Change in	Change in Planted Area			٠		Causes of Damage	f Damag	a	
	Planted	To Pre-	On the	Harvested	Damaged						
Year		ceeding Year	Basis of 1975	Area	Area	Flood	Pest	Diseas	Blast	Draught	Others
1970/71	68,670			67,128	1,452	1,257,	132	1	2	1	19
1971/72	68,940	+ 270		66,734	2,206	1,939	78	. 1	ł	34	155
1972/73	70,389	+ 1,449	-	68,070	2,319	1,888	164	i	1	1	267
1973/74	65,790	- 4,599		54,462	11,328	8,291	1,057	1	ı	1,637	343
1974/75	70,286	+ 4,496	0	66,955	3,341	2,645	422	23	1	99	177
1975/76	66,459	- 3,827	- 3,827	64,825	1,634	78	322	1	1	1,181	53
1976/77	62,442	- 4,017	- 7,844	60,828	1,614	727	428	7	1	374	81
1977/78	69,106	+ 6,664	- 1,180	68,561	545	·#	438	1	1	1	106
1978/79	64,470	- 4,636	- 5,816	63,639	831	æ	445	1	10	304	99
1979/80	60,804	- 3,666	- 9,482	57,173	3,631	846	471	ı	1	2,206	108
1980/81	59,602	- 1,199	-10,681	27,606	1,999	09	1,561	1	1	264	114
1981/82	43,602	-16,003	-26,787	34,890	8,712	451	918	24	i.	7,319	. 1
1982/83	46,934	+ 3,332	-23,455	46,279	655	20	609	σ		17	1
1983/84	24,951	-21,983	-45,438	18,788	6,163	4,630	680	1	1	1	853
1984/85	33,189	+8,238	-37,200	31,722	1,467	257	1,205				5
Source:	Statistic	Statistics of Paddy	ts.								

Table 8-3 The Planted Area of Paddy by District for the Main Season

KADA KADA					(31,826) 45.3	(28,022) 42.2	(22,374) 35.8	(25,955) 37.6	(23,015) 35.7	(20,960) 34.5	(22,251) 37.3	(16,275) 37.3	(21,550) 45.9	4,091 16.4	20,051 60.4			•
Ulu Kelantan	555	793	714	741	754	753	753	893	654	654	826	455	633	367	219	400	893	16 U 7
Tanah Merab	4,905	2,948	2,835	1,863	3,210	4,814	6,267	6,038	5,393	5,354	5,375	4,088	1,251	1,505	470	2,538	6,267	30.
Machane	5,783	4,941	4,941	4,941	5,868	4,941	5,796	5,851	5,208	5,010	4,664	3,827	5,717	4,275	3,861	4,469	5,868	,
Pasir	12,236	12,571	12,085	12,369	12,369	11,693	11,713	12,140	11,965	11,534	11,534	10,462	9,850	6,457	5,583	8,777	12,571	i
Bachock	10,445	9,978	9,978	9,573	8,884	7,237	7,375	7,655	4,973	5,242	4,943	4,227	4,061	665	641	2,907	10,445	i
Kota	9,285	11,693	14,483	14,459	15,048	14,513	14,738	14,738	14,653	14,584	13,897	13,520	11,498	1,285	641	8,168	15,048	1
Pasir	17,435	17,476	16,889	14,657	16,257	15,400	11,040	16,261	16,156	13,262	12,809	5,517	11,607	4,139	1,176	7,050	17,476	•
Tumpat	8,505	8,539	8,465	7,189	7,898	7,108	4,759	5,730	5,468	5,164	5,557	1,506	2,317	1,906	1,023	2,462	8,539	1
Total Area (Kelantan)	68,670	68,940	70,389	65,790	70,286	66,459	62,442	69,106	64,470	60,804	59,605	43,602	46,934	24,951	33,189	Average 5 Year 1980/81 - 1984/85	Paddy Field Area Max.	
Υ σ 7	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84	1884/85	(A) Aven 198((B) Padd Max.	

Table 8-4 The Planted Area of Paddy for Main Season by KADA Area and the Remaining Area

(unit: ha)

		KADA	Area	Remainin	g Area
Year	Province	Area	7	Area	- %
1974/75	70,286	31,826	45.3	38,460	54.7
1975/76	66,459	28,022	42.2	38,437	57.8
1976/77	62,442	22,374	35.8	40,068	64.2
1977/78	69,106	25,955	37.6	43,151	62.4
1978/79	64,470	23,015	35.7	41,455	64.3
1979/80	60,804	20,960	34.5	39,844	65.5
1980/81	59,605	22,251	37.3	37,354	62.7
1981/82	43,602	16,275	37.3	27,327	62.7
1982/83	46,934	21,550	45.9	25,384	54.1
1983/84	24,951	4,091	16.4	20,860	83.6
1984/85	33,189	20,051	60.4	13,138	39.6

The Reduction of Planted Area of Paddy for Main Season in Comparison with that in the Previous Year

(unit: ha)

Year	Province	KADA Area	Remaining Area
1974/75			
1975/76	-3,827	~3,804	- 23
1976/77	-4,017	-5,648	+1,631
1977/78	+6,664	+3,581	+3,083
1978/79	-4,636	-2,940	-1,696
1979/80	-3,666	-2,055	-1,611
1980/81	-1,199	+1,291	-2,490
1981/82	-16,003	-5,976	-10,027
1982/83	+3,332	+5,275	-1,943
1983/84	-21,983	-17,459	-4,524
1984/85	+8,238	+15,960	-7,722

Table 8-6 The Draught Area by District for Main Season

	-			•					un)	(unit: ha)
Year	Draught Total	Tumpat	Pasir Mas.	Kota Baharu	Bachock	Pasir Puteh	Machang	Tanah Merah	Ulu Kelantan	KDADA
17/0/61	1	i	.	i	1	i	i	ŧ	ı	ı
1971/72	34	34	·	i	1	1	1	i	ş	ı
1972/73	ŀ	1	ť	í		1	ı	I	ı	ı
1973/74	1,637	1	1,637	\$	i		ŧ	ı		14
1974/75	99	1		79		ı	t	ı	ı	1
97/5/76	1,181	7	531	237	4.3	255	109	1	1	٠ ١
71/916	374	59	115	4	97	93	1	57	ŧ	ı
977/78	1	ı	ī	i	i	1	ŧ	ı	ı	ı
978/79	304	37	1	· 1	67	197	ന	i,	ı	ı
08/626	2,206	466	668	41	405	267	112	242	'n	. 1
1980/81	264	1	1	1	210	32	20	, 1	2	ı
1981/82	7,319	351	1,531	548	451	3,985	1	234	ن ا	i
982/83	17	. i	7	1	01	ı	ŧ	1	1	1
883/84	1				i	ı	ı	i	i	i
984/85		•		1	1			-	***	

The Planted, Harvested and Damaged Area of Paddy for Off Season in Kelantan Province, 1972 to 1985 Table 8-7

(unit: ha)

		Change in	Change in Planted Area	•			ວ	Causes of Damage	Damage		-
Year	Planted Area	To Pre- ceeding Year	On the Basis of 1975	Harvested Area	Damaged Area	Flood	Pest	Diseas	Blast	Draught	Others
1971	n.a			ព.ព	а. С	ដុំព	ជ	ф с	n.a	ជ.ជ	# · E
1972	17,283			17,195	88	1	38	0,1	1	60	23
1973	21,033	+ 3,750		20,011	1,022	1	1,006	ı	ì	1	9
1974	23,139	+ 2,106		22,655	484	i	484	ı	1	. 1	- 1
1975	27,338	+ 4,199	C	26,691	979	ı	636		1	ı	10
1976	24,184	- 3,154	- 3,154	23,745	664	334	75	i	1	11	19
1977	27,462	+ 3,278	+ .124	27,250	212	i	183		1		29
1978	26,571	. 891	797	26,308	263	\$	186	1	. 1	, !	77
1979	27,037	+ 466	- 301	26,125	912	534	287	1		38	55
1980	19,390	- 7,648	- 7,948	19,125	. 265	•	191	9	ì	45	23
1981	21,870	+ 2,480	- 5,468	20,261	1,609	941	593		ì	E.1	29
1982	20,921	646 -	- 6,417	20,572	349	14	196	10	1	129	1
1983	19,407	- 1,514	- 7,931	19,086	321	121	190	1	1	10	i
1984	25,559	+ 6,152	- 1,779	25,070	489	1	365	14	à	110	1
1985	24,412	- 1,147	- 2,926	24,318	94	1	71	20	ı	ı	ť'n

Table 8-8 The Planted Area of Paddy by District for the Off Season

				•	:	-					•
Year	Total Area	Tumpat	Pasir Mas	Kota Bahru	Bachock	Pasir Puteh	Machang	Tanah Merah	Ulu Kelantan	K A D Area	D A %
1972	17,283	1,421	3,173	8,809	2,147	1,357	61	315	555		
1973	3 21,033	936	4,673	11,543	2,971	770	72	69	793		
1974	4 23,139	1,361	4,363	11,654	2,991	2,309	73	389	714		
1975	5 27,338	2,420	5,482	12,218	4,493	1,944	182	452	741	(22, 293)	81.5
1976	6 24,184	3,401	5,482	. 12,277	1,924	235	156	809	754	(21,655)	89.5
1977	7 27,462	3,605	5,570	11,713	4,433	1,094	165	693	753	(25,434)	92.6
1978	8 26,571	3,422	5,628	11,729	3,296	1,478	157	822	754	(25,692)	7.96
1979	9 27,037	3,507	4,153	11,741	4,618	1,559	138	1,096	893	(21,322)	78.9
1980	19,390	870	1,843	11,060	2,734	1,676	89	1,118	654	(21,442)	110.6
1981	1 21,870	963	5,418	9,750	2,929	1,595	89	1,114	654	(18,993)	86.8
1982	20,921	1,195	4,417	10,150	4,195	621	132	211	ı	(17,965)	85.9
1983	3 19,407	2,288	4,518	8,965	2,845	785	1	9	ı	(18,721)	96.5
1984	4 25,559	280	1,175		530	217	818	383	20	22,136	86.6
1985	5 24,412	480	904	325	308	1	880	292		21,182	86.8
3	(A) Average 5 Year	1,041	3,286	5,838	2,161	949	384	401	135		
. •	1980/81 - 1984/85				-						
(B)	Paddy Field Area	8,539	17,476	15,048	10,445	12,571	5,868	6,267	893		
9	Cropping Ratio	12%	192	39%	21%	50	7%	% 9	15%		

Table 8-9 The Cropped Area of Paddy per Year in KADA

Sub Area Paddy Field	Kemubu/S 21.85		Lemal/Alor 9,60		Pasir Ma		Total 33,65	
Eadily Flexio	Cropped	7/8	Cropped	%	Cropped		Cropped	7
1974/75	36,455	167	13,918	145	3,746	171	54,119	161
1975/76	34,027	156	11,904	124	3,745	171	49,676	148
1976/77	36,819	168	7,468	78	3,521	160	47,808	142
1977/78	35,989	165	11,936	124	3,723	170	51,648	153
1978/79	34,273	157	6,633	69	3,435	156	44,341	132
1979/80	32,232	147	7,195	75	2,975	136	42,402	126
1980/81	29,810	136	9,056	94	2,408	110	41,274	123
1981/82	26,800	123	5,832	61	1,608	73	34,240	102
1982/83	27,565	126	10,010	104	2,696	123	40,271	120
1983/84	16,284	75	7,335	76	2,608	119	26,227	78

Note: The cropped area are those of both season of main and off. Figures of percentage show the crop intensity of annual cropped area divided by the paddy field of Sub Area.

Source: Statistical Digest, KADA

Table 8-10 The Cropped Area of Paddy for Both Season in KADA

(unit: ha, %)

			Lewal/				•	
Sub-Area	Kemubu/		Alor F	and Delivering and P.P.	Pasir N		Tota	
Paddy Field	21,8		9,60		2,19		33,65	
	Cropped	7	Cropped		Cropped	- 1	Cropped	
<u>Main Season</u>								
1974/75	19,866	90.9	9,872	102.8	2,087	95.1	31,826	94.6
1975/76	19,866	90.9	6,069	63.2	2,087	95.1	28,022	83.3
1976/77	18,976	86.8	1,618	16.8	1,780	81.1	22,374	66.5
1977/78	18,065	82.7	5,907	61.5	1,983	90.3	25,955	77.1
1978/79	18,045	82.6	3,194	33.3	1,776	80.9	23,015	68.4
1979/80	17,398	79.6	2,024	21.1	1,539	70.1	20,960	62.3
1980/81	16,807	76.9	4,108	42.8	1,366	62.2	22,251	66.1
1981/82	12,905	59.0	2,160	22.5	1,210	55.1	16,275	48.4
1982/83	14,970	68.5	5,248	54.6	1,332	60.7	21,550	64.0
1983/84	2,266	10.4	837	8.7	988	45.0	4,091	12.2
Off Season					·	·		
1975	16,589	83.7	4,046	42.3	1,659	79.4	22,293	70.8
1976	14,161	71.4	5,835	61.0	1,658	79.3	21,655	68.8
1977	17,843	90.0	5,850	61.1	1,741	83.3	25,434	80.8
1978	17,924	90.4	6,029	63.0	1,740	83.3	25,692	81.6
1979	16,228	81.9	3,439	35.9	1,659	79.4	21,322	67.7
1980	14,834	74.8	5,171	54.0	1,436	68.7	21,442	68.1
1981	13,003	65.6	4,948	51.7	1,042	49.9	18,993	60.3
1982	13,895	70.1	3,672	38.4	398	19.0	17,965	57.1
1983	12,595	63.5	4,762	49.8	1,364	65.3	18,721	59.5
1984	14,018	70.7	6,498	67.9	1,620	77.5	22,136	70.3

Note: Figures of percentage show the crop intensity of annual cropped area divided by the paddy field of Sub Area.

Source: Statistical Digest, KADA

Table 8-11 Basic Data for the Correlation Study between Paddy Yield and Rainfall/Pumping Discharge by Growing Stage of Paddy - Kemubu/Salor Area

Year	Month	Rainfall	Discharge	Dates of Growing Stage	Paddy Yield
		(mn)	(10 ⁶ t)		(t/ha)
	Jam.	44.1	35.11		
	Feb.	25.1	35.40	•	
	Har.	17.5	24.43		
	ADY.	95.1	0.01		ويستقي ع و حسم استان م
	May	158.3	33.98	SW-7, SEE-17	
1980	Jun.	136.2	34.21	TP-12, RS	
	Jul.	223.5	36.26		
	Aug.	268.5	57.54	PS-5, BS-29	
	Sep.	218.5	13.79	STV-20	2 16
	Oct.	256.0	0.38	EV-5	4.15
	Nov.	375.5	8.54	SW-2. SEE-12	
	Dec.	752.0	7.09	TP-7. RS	
	Jan.	24.5	31.03	ጉ ९−26	
	Feb.	52.5	25.21	RS-19	2 02
	Mar.	22.1	33.58	STW-10 HV-26	2.92
	Apr.	82.5	11,40		
	May	275.5	9.54	SW-7 SEE-17	
1981	Jun.	105.8	22.67	TP-17, RS	
	Jul.	128.0	37.76	PS-22	
	Aug.	35.3	34.89	BS-15	= 40
	Sep.	126.8	19.25	STW-7 HV-22	. 2.69
	Oct.	164.0	7.40	SW-22	,
-	Nov.	429.0	13.45	SEE-2, TP-27	
	Dec	845.5	13.43	RS	
	Jan.	25.0	28.17	PS-26	
	Feb.	17.6	24.62	85-19, STW-25	
	Mar.	50.0	18.42	<u> </u>	2.44
	Apr.	40.4	9.91	SW-16, SEE-26	
	May	100.5	29.83	TP-21, RS	•
1982	Jun.	153.6	29.82	PS-16	
	Jul.	330.1		BS-12	
	Aug.	237.1	30.94	STV-19	
	Sep.	233.5	16.73	HA-18	3.62
		5/9 ÷			
	Oct.	242.9	9.73	611 AA	
	χον.	325.9	13.27	SW-20, SEE-30	
	Dec.	626.1	12.96	TP-25, RS	
	Jan.	86.6 10.5	37.51	PS-30	
•	Feb. Mar.	96.8	37.84 41.22	The state of the s	
	ADT.	51.7	9.43	HS-23, STW-31 HV-30	3 22
	SIVE 0		3.43		2.34
. :	May	62.4	15.64	SW-25	•
1983	Jun.	142.5	39.33	SEE-5, TP-30	
	Jul.	306.0	34.08	RS	
	Aug.	203.5	39.61	PS-7	
	Sep.	244.9	26.05	BS-1	
	Oct.	176.0	16.56	STM-7, HV-27	4.04
		331 5			
	Nov.	331.5	2.07	non main season	
***************************************	Dec.	1,303.5	0.07	due to heavy fl	DOG

Note: SW: Start of water supply SEE: Start of seeding nursery TP: Start of transplanting RS: Rooting stage FS: Panicle stage BS: Booting stage STW: Stop of water supply HV: Harvesting

Source: KADA office

Table 8-12 Paddy Yield and Growth Rate - Kelantan

Year	Main Season Paddy Yield (t/ha)	Year	Off Season Paddy Yield (t/ha)
1975/76	1.972	1976	2.680
1976/77	2.432	1977	2.895
1977/78	2.510	1978	2.779
1978/79	2.368	1979	2.713
1979/80	2.508	1980	3.114
1980/81	2.478	1981	2.817
1981/82	2.161	1982	3.422
1982/83	2.357	1983	3,341
1983/84	2.221	1984	2.870
1984/85	2.783	1985	3.026
Average	2.384	Average	2.966

Note: y = 2.232 + 0.026x y = 2.713 + 0.046x

$$y = 2.713 + 0.046x$$

$$GR = \frac{0.026}{2.232} = 0.0116 = 1.2\%$$
 $GR = \frac{0.046}{2.713} = 0.01695 = 1.7\%$

$$GR = \frac{0.046}{2.713} = 0.01695 = 1.7%$$

Source: SEPU

Table 8-13. Paddy Yield and Growth Rate-Kelantan

Year	Main Season Páddy Yield (t/ha)	Year	Off Season Paddy Yield (t/ha)
1970	2.180	1970	2.662
1971	2.302	1971	2.795
1972	1.954	1972	2.936
1973	2.267	1973	2,475
1974	2.224	1974	2.852
1975	1.847	1975	2.567
1976	1.973	1976	2.681
1977	2.429	1977	2,896
1978	2.511	1978	2.780
1979	2.369	1979	2.715
1980	2.509	1980	3.114
Average	2.233	Average_	2.770

Note: y = 2.349 + 0.0444x

$$y = 2.653 + 0.0195x$$

$$GR = \frac{0.044}{2.349} = 1.97$$

$$GR = \frac{0.0195}{2.653} = 0.72$$

Table 8-16 Paddy Meld for Main Sesson

(unit: tons/ha harvested)

	District	At Present (1985)	1998/ 1999 (14 y	1998/ 1999/ 1999 2000 (14 yr th)	2000/	2007	2002/	2003/	2004/	2005/	2006/	2007/	2008/	2009/	2010/	2011/	2012/	2013/	2014/	2015/	2016/	2017
	Kota Bharu	2.71	3.20	3.20 3.24	3.28	3.32	3.36	3.40	3.44	3,48	3.52	3.56	3.60	3.64	3.68	3,73	3.76	3.76	3.76	3.76	3.76	3.76
Inside	Pacir Mas	2.93	3.46	3.50	3.54	3.59	3,63	3.67	3.72	3.76	3.76	3.76	3.76	3,76	3.76	3.76	3.76	3.76	3.76	3.76	3:76	3.76
irrigation	Pasir Putch	2.79	3,30	3.34	3.38	3.42	3.46	3.50	3.54	3.59	3.63	3.68	3.72	3.76	3.76	3.76	3.76	3.76	3.76	3,76	3.76	3.76
scheme	Tempat	2.96	3.50	3.54	3.58	3.63	3.67	3.72	3.76	3.76	3.76	3.76	3.76	3.76	3.76	3,76	3.76	3.76	3.76	3.76	3.76	3.76
(irrigated) Bachoh) Lachoh	2.71	3.20	3.24	3.28	3.32	3,36	3.40	3.44	3.48	3.52	3.56	3.60	3.64	3.68	3.73	3.76	3.76	3.76	3.76	3.76	3.78
-	Hacheng	2.79	3.30	.30 3.34	3,38	3.42	3.46	3.50	3.54	3.59	3.63	3.68	3.72	3.76	3.76	3.76	3.76	3.76	3.76		3.76	
	Tanah Hersh	2.83	3.35	3.35 3.39	3,43	3.47	3.51	3.36	3.60	3.64	3.68	3.73	3.76	3.76	3.76	3.76	3.76	3.76	3.76	3.76	3.76	
								:														
	Kots Bharu	2.28	2,69	2.69 2.72	2.75	2.79		2.86	2.89	2.92	2,92	2.92	2.92	2.32		2,92	2.92	2.92	2.92	2.92	2.92	2,92
• .	Pasir Hans	1.74	2.06	2.06 2.08	2.11	2,14	2,16	2,19	2.21	2.24	2,27	2.29	2.32	2.35	2,35	2.35	2.35	2.35	2.35	2,35	2.35	2.35
Outside .	Pastr Purch	2.14	2.53	2.56	2:59	2.62		2,69	2.72	2.75	2.78	2.83	2.85	2.88		2.88	2.88	2,88	2.88	2.88	2.88	2.88
irrigation	Tempat	2,13	2.52	2.52 2.55	2,58	2.61		2.67	2.71	2.74	2.77	2.8]	2.84	2.87		2.87	2,87	2.87	2.87	2.87	2.87	2,87
achene	Bachoh	2.01	2.38	1.38 2.41	2.45	2.47		2,53	2.56	2.59	2.62	2.65	2.68	1.12		2.12	2.72	2.72	2.72	2.72	2.72	2,72
(Rainfed)	Machang	2.36	2.19	2.79 2.82	2.86	2.89		2.96	3.00	3.03	3.03	3.03	3.03	3.03		3.03	3.03	3.03	3.03	3.03	3.03	3.03
	Tensh Hersh	2.43	2.87	2.87 2.90	3.94	2.97	3.01	3.05	3.08	3.12	3,12	3,12	3.12	3.12		5.5	3.12	3.12	3,12	3.12	3.12	3.12
	:												٠									

Note: 1) Annual growth ratio is estimated at 1.2 percent using the production of paddy harvested from 1975/76 to 1984/85' sourced from the data of Kelantan Provinca (SEPU).

²⁾ Paddy yield at present is calculated on yield by the district from 1978/79 to 1986/85 sourced from the SEPU.

³⁾ Pigures are yield with harvested area of paddy.

Table 8-15 Paddy Yield for Off Season

Foliation Pastrice C. C. C. C. C. C. C. C		1																	Cum	(unit: to	tons/ha harvested)	harve	red)
Rote Bharu 3.11 3.43 3.46 3.45 3.55 3.55 3.55 3.55 3.55 3.55 3.56 3.50 3.55 3.55 3.55 3.55 3.56 3.55 3.56 3.55 3.56 3.55 3.56 3.56 3.56 3.57 3.75	*. :	Discrice	At Present (1985)	1999 (14th)	2000	2001	2002	2003	2004	2005	2005	2007	2008	2009	2010	2011		2013	2014	2015	2016	2017	2018
Frota Bharu 2.90 3.20 3.22 3.24 3.25 3.36 3.40 3.40 3.46 3.47 3.46 3.46 3.47 3.46 3.46 3.46 3.46 3.47 3.46 3.46 3.47 3.46 3.47 3.49 3.46 3.47 3.49 3.48 3.46 3.47 3.46 3.48 3.46 3.48 3.46 3.46 3.49 3.40 3.47 3.49	:				•																		
Pestr Has 2.90 3.20 3.22 3.24 3.27 3.29 3.31 3.34 3.36 3.38 3.41 3.46 3.46 3.48 3.51 3.53 3.56 3.58 3.61 3.53 3.55 3.75 3.29 3.31 Pestr Purch 2.82 3.11 3.13 3.15 3.12 3.22 3.24 3.27 3.29 3.32 3.34 3.36 3.46 3.46 3.46 3.46 3.46 3.59 3.95 3.95 3.95 3.95 3.95 3.95 3.95	. •	Kots Bharu	3 13	3.43	3.45	3.48	3.50	3.53	3.55	3.58	3,60	3.63	3.65	3.68	3.70	3.73	3.75	3.78	3.80		3.86		3.92
Tempar 2.82 3.11 3.13 3.15 3.16 3.20 3.22 3.24 3.27 3.29 3.32 3.34 3.35 3.35 3.43 3.45 3.45 3.45 3.59 3.59 3.59 3.59 3.59 3.59 3.59 3.5	Inside	Pasir Mas	2.90	3.20	3.22	3.24	3.27	3.29	3.31	3.34	3.36	3,38	3.41	3.43	3.46	3.48	3.51	3.53	3.56		3.61		3.66
Tempte 3.36 3.71 3.74 3.76 3.89 3.81 3.84 3.87 3.90 3.93 3.95 3.95 3.95 3.95 3.95 3.95 3.95	irrigacion		2.82		3.13	3.15	3.18	3.20	3.22	3.24	3.27	3.29	3,32	3.34	3.36	3.38	3.41	3.63	3.45	3.43		3.53	3.55
Hachang 3.27 3.61 3.66 3.69 3.71 3.74 3.47 3.49 3.52 3.54 3.57 3.59 3.62 3.62 3.63 3.67 3.70 3.72 3.75 Tanah Herah Xoca Bharu 2.79 3.08 3.10 3.12 3.15 3.17 3.19 3.21 3.23 3.25 3.28 3.32 3.34 3.34 3.34 3.34 3.34 3.34 3.34	scheme	Tempat	3.36		3.74	3.76	3.79	3 81	3.84	3.87	3.90	3.93	3.95	3,95	3.95	3.95	3.95	3.95	3.95	3.95		3.95	3.95
Machang 3.27 3.61 3.64 3.66 3.69 3.71 3.74 3.76 3.79 3.82 3.84 3.87 3.90 3.93 3.95 3.95 3.95 3.95 3.95 3.95 3.95	(trrigated)) Bachoh	2.99	3.30	3.32	3.35	3.37	3.39	3,42	3.44	3.47	3.49	3.52	3.54	3.57	3.59	3.62	3.65	3.67	3.70	3.72	3.75	3.7
Tanah Merah - Kota Bharu 2.79 3.08 3.10 3.12 3.15 3.17 3.19 3.21 3.23 3.25 3.28 3.32 3.34 3.34 3.34 3.34 3.34 3.34 3.34		Machang	3.27		3.64	3,66	3.69	3.71	3.74	3.76	3.79	3,82	3.84	3.87	3.90	3.93	3.95	3,95	3.95	3.95	3.95	3.95	3.95
Xota Bharu 2.79 3.08 3.10 3.17 3.19 3.21 3.25 3.25 3.32 3.34 3.42 3.42 3.42 3.42 3.42 3.42 3.42 3.42 3.42 3.14 3.14 3.14 3.14 3.14 3.14		Tanah Merah			٠										* .								
Kota Bharu 2.79 3.08 3.10 3.12 3.15 3.11 3.19 3.21 3.23 3.25 3.34 3.37 3.17 3.17 3.17 3.17 3.17 3.17 3.17 3.17 3.17 3.17 3.17 3.17 3.17 3.15																							
Pastr Mass 2.66 2.93 2.95 2.97 2.99 3.01 3.03 3.06 3.08 3.10 3.12 3.17 3.17 3.17 3.17 3.17 3.17 3.17 3.17	1 	Kota Bharu	2.79	3.08	3.10	3.12	3.15	3.17	3.19		3.23	3, 25	3.28	3.32	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	<u>س</u> س
Pastr Putch 2.64 2.91 2.93 2.95 2.97 2.99 3.01 3.03 3.06 3.08 3.10 3.12 3.15 3.15 3.15 3.15 3.15 3.15 3.15 3.15	.*	Fasir Mass	2.66	2.93	2,95	2.97	2.99	3.01	3.03		3.08	3.10	3.12	3.15	3.17	3.17	3.17	3.17		3.17	3.17	3.17	3.1
Tempat 3.11 3.43 3.48 3.50 3.53 3.58 3.60 3.63 3.65 3.68 3.70 3.70 3.70 3.70 3.70 3.70 3.70 3.70	Atside	Pastr Purch	2.64	2.91	2.93	2.95	2.97	2.99	3.01			3.08	3.10	3.12	3.15	3.15	3.15	3.15		3.15	3.15	3.15	3.1
Bachoh 2.66 2.93 2.95 2.97 2.99 3.01 3.06 3.08 3.10 3.12 3.15 3.17 3.17 3.17 3.17 3.17 3.17 3.17 3.17	lrzigacion		13.0		3.45	3.48	3.50	3.53	3.55			3,63	3.65	3,68	3.70	3.70		3.70	3.70	3.70	3.70	3.70	3.7
Machang 2.87 3.17 3.19 3.21 3.24 3.26 3.28 3.31 3.33 3.35 3.40 3.42 3.42 3.42 3.42 3.42 3.42 3.42 3.42	schene	Bachoh	2.66	2.93	2.95	7.97	2.99	3.03	3.05		3.08	3,10	3.12	3.15	3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17
2.63 2.90 2.92 2.94 2.96 2.98 3.00 3.02 3.07 3.09 3.11 3.14 3.14 3.14 3.14 3.14 3.14 3.14	(Rainfed)	Machang	2.87		3.19	3.21	3.24	3.26	3.28		3.33	3.35	3,38	3.40	3.42	3.42		3,42	3.42	3.42	3,42	3.42	3.42
		Tanah Herah	2.63		2,32	2.94	2.96	2.98	3.00		3.05	3.07	3.09	3.11	3.24	3.14	3.14	3.14	3.14	3.5	3.14	3.14	3.16
											1												ļ

Note: 1) Annual growth ratio is estimated at 0.7 percent using the production of paddy harvested from 1970 to 1980 sourced from the data of Kelantan Province (Department of Agricultural, Agricultural Basic Statistics).

2) Paddy yield at present is calculated on yield by the district from 1978/79 to 1984/85 sourced from the SEPU.

Price Structure for Rice Table 8-16

}-		1986	2	Figure 1995	Pronomic	20 Financial	2000
	41	דוומווכדפד	7	דדוופוורדמד	CONOUNT C	ב אוומווכדמד	o di conomico
US\$/mt Export price of Thai 5% brokens, FOB.		177	177	212	212	216	216
bangkok 1/ Grade difference (less $10\%)$ 2/		-18	-18	-21	-21	-21	-21
Ocean freight and insurance 3/		+30	+30	+30	+30	+30	+30
C.1.f. price, Port Klang		189	189	221	221	225	225
Ms/mt (US\$1 = M\$2.5U) 4/ C.1.f. price, Port Klang		473	473	553	553	563	563
Port handling 5/		+30	+22	+30	+22	+30	+22
Transport cost, Port Klang to		+140	+92	+140	+92	+140	+92
Kota Bharu 6/							
Wholesale price, Kota Bharu		643	587	723	299	733	677
Transport cost, KADA area to K.B.		អ្ន	7-	<u>نې</u>	7-	ጥ '	*
Ex-mill price, KADA area		.638	583	718	663	728	673
Paddy equivalent, KADA area 7/		415	379	467	431	473	437
Milling Cost 8/		67-	77-	65-	-44	-49	-44
Farm-gate price 9/		366	335	418	387	424	393

Macro and Financial Assumption and Half-Yearly Revision of Commodity Price Forecasts, World Bank Memorandum Feb. 5, 1987. Note:

Based on the Kemasin-Semerah Integrated Rural Development Project Phase II, Economic Reevaluation of The grades producted in the projected area close in equality to 15% broken Thai rice According to W.B. data. Then the quality adjustment is reduced 10%.

Exchange rate is based on the rates which Consultants collected during the field survey. Project, 1986.

The charge is based on the Kemasin-Semerak Report, 1986.

The rate of recovery is 65% based on the information from LPN, PERINGAT. The transport cost is based on the Kemasin-Semerak Report, 1986.

The milling cost is based on the Kemasin-Semerak Report, 1986.

A conversion factor of 0.89 applied for port handling. Actual farm gate price of rice is 0.58 m\$/kg in 1986. The converted price of paddy is 0.377 m\$/kg.

Table 8-17 Production Cost of Paddy per ha. (traditional)
- Market Price -

(unit: M\$)

			Family Labor	labor	Total
	Item	Materials	day	Wage	Cost
1.	Preparation of nursery		5	45.00	45.00
2.	Seed 1/	20.00	1	9.00	29.00
3.	Plowing (contract)	₩.	-	-	200.00
4.	Transplanting (contract)	***		← 3	225.00
5.	Fertilizing 2/	170.00	3	27.00	197.00
6.	Pestciding & weeding 3/	134.00	7	63.00	197.00
7.	Harvesting (contract)	-	***		330.00
8.	Others 4/	ench.	-	••	74.00
	Total	338.00	16	144.00	1,297.00

Note:

- 1/ Seed: 25 kg x $$0.75 = $18.75 \div 20.00
- 2/ Fertilizer: Amophos 10 kg/ha N 80 kg/ha P₂O 30 kg/ha K₂O 20 kg/ha
- 3/ Chemical (to be altered)
 Furadan 3G 10 kg
 Rumputox 2.2 kg
 Sumidan 49.4 kg
- 4/ Transportation from paddy field to mill.

Source: KADA

Table 8-18. Production Cost of Paddy per ha. (traditional)
- Economic/Accounting Price
(unit: M\$)

٠		•	Family Labor	labor	Total
	Item	<u>Materials</u>	day	Wage	Cost
1.	Preparation of nursery	·	5	27	27
2.	Seed	17	1	6	23
3.	Plowing (contract)	. -	-		172
4.	Transplanting (contract)	t=	-	'	135
5.	Fertilizing	146	3	. 16	162
6.	Pestciding & weeding	115	· 7	38	153
7.	Harvesting (contract)		-	-	198
8.	Others	y to the 😝 😝	- .	. 	64
	Total	278	16	87	934

Note: Conversion factor for agricultural inputs in 0.86. Shadow rate of unskilled labor's wage in 0.6.

Table 8-19 Production Cost of Paddy per ha (direct seeding) - Market Price -

(unit: M\$)

		Family Labor	/ labor	Total
Item	Materials	day	Wage	Cost
Land preparation	250	2	18	268
Seed 1/	30			30
Broadcasting		3	··· 27	27
Pesticide & weeking	140	11	99	239
Fertilizing 2/	200	2	18	218
Harvesting (contract)			•••	300
Others	-		-	54
Total	<u>620</u>	18	162	1,136

 $\frac{1}{2}$ Seeds 40 kg x 0.75\$ = \$30 $\frac{1}{2}$ Fertilizer: N = 100 kg, P₂O₅ = 40 kg, K₂O = 30 kg

Source: KADA

Table 8-20. Production Cost of Paddy per ha. (direct seeding) - Economic/Accounting Price -

(unit: M\$)

(x,y) = (x,y) + (x,y	The second section of the second	Family	labor	
Item	Materials	Labor day	Wage	Total Cost
Land preparation	215	2	11	226
Seed	26	· . •	- , `	- 26
Broadcasting	•	3	16	-16
Pesticide & weeking	120	11	59.	179
Fertilizing	172	2	11	183
Harvesting (contract)		·	· ·	180
Others	-	-	•••	46
<u>Total</u>	<u>533</u>	18	<u>97</u>	<u>856</u>

Conversion factor for agricultural inputs in 0.86. Shadow rate of unskilled labor's wage in 0.6.

Table 8-20-1 Production Cost of Maize per ha. -Market Price- Unit:M\$

		Family Labo) <u>r</u>	
Item	Materials	Labor days	Wage	Total Cost
1.Land preparation((contract)	· -	A33	250
2.Lime 1/	83	5	45	128
3.Seeds 2/	·	8	72	72
4.Seeding	200	-	-	200
5.Fertilizer3/	227	8	72	299
6.Weeding 4/	58	10	90	148
7.Pesticontrol	60	10	90	150
8.Harvesting	-	10	90	90
Total	628	51	459	1,337

- Note: 1/ 2.5 MT 3times 2/ Seeds 20 kg 3/ Urea 220 kg Triple Superhosphate 130 kg Muriate of potash 70 kg
 - 4/ Herbicide Mixed paraquart 1.6 kg, Atragine 2.5 kg

Table 8-20-2 Production Cost Of Maize per ha. -Economic Price Unit:M\$
Family Labor

		ramily Lab)1	
Item	Materials	Labor days	Wage	Total Cost
1.Land preparation	-	~		215
2.Line	71	5	27	98
3.Seeds	•	8	43	43
4.Seedling	172		-	172
5.Fertilizer	195	8	43	238
6.Weeding	50	10	54	104
7.Pest Control	52	10	54	106
8.Harvesting		10	54	54
Total	540	51	275	815

Table 8-20-3 Production Cost of Ground nuts per ha. -Maket Price- Unit:M\$

		Family Labor	or	
Item	Materials	Labor days	Wage	Total Cost
1.Land preparati	on(contract)		-	250
2.Seeding	. = '	17	153	153
3.Seeds 1	/ 200		-	200
4.Fertilizer 2	/ 293	10	90	383
5.Pest control	65	7	63	128
6.Weeding 3	/ 105	20	180	289
7.Harvesting	-	47	423	423
Total	667	101	909	1,826

- Note; 1/ Seeds 100 kg
 2/ Fertilizer: Sulphate of Amonia 162 kg, Tripule Superphosphate 122 kg, Muriete of Potash 93 kg Kapor 1MT
 - 3/ Herbicide: Lasso 4.6 liter

Table 8-20-4 Production Cost of Ground Nuts per ha.
-Economic Price - Unit:M\$

	T.		
or days	Wage	Total Cost	
-	-	215	
17	92	92	
**	-	172	
10	54	306	
7	38	94	
20	108	198	
47	254	254	
101	546	1,331	
	17 10 7 20 47	17 92 10 54 7 38 20 108 47 254	7 days Wage Total Cost - 215 17 92 92 - 172 10 54 306 7 38 94 20 108 198 47 254 254

Table 8-20-5 Production Cost of Tobacco per ha.
-Market Price - Unit:M\$

		Family	Labor	•	
Item	Materials	Labor	days Wage	Total Cos	t_
1.Nursery bed	39	18	162	201	
2.Mengerek	49	94	. 846	895	
3.Plastik	108	·	<u> </u>	108	
4.Land preparat	ion 34	-	-	34	
5.Planting	- :	104	936	936	
6.Watering	_	15	135	135	
7.Fertilizer 1/	350	12	108	458	
8.Pest control	244	15	135	379	
9.Weeding	-	. 32	288	288	
10 Mengasi	-	20	180	180	
11.Harvest	_	37	333	333	
10.Other	100	_	 2	100	
Total	924	347	3,123	4,047	

Note: 1/ N= 20 kg/ha, $p_20_5=168$ kg/ha, $k_20=134$ kg/ha Mg0=27 kg/ha, B=3.5 kg/ha

Table 8-20-6 Production Cost of Tobacco per ha.
- Economic Price - unit: M\$

	•	Family !	Labor	
Item	Materials	Labor d	ays Wage	Total Cost
1.Nursery bed	34	18	97	131
2.Mengerek	42	94	508	550
3.Plastik	93	- :	_	93
4.Land prepara	tion 29	-		29
5.Planting	85	104	562	562
6.Watering	-	15	81	81
7.Fertilizing	301	12	65	366
8.Pest control	210	15	81	291
9 Weeding	-	32	173	173
10.Mengasi	-	20	108	108
11.Harvest	-	37	200	200
12.Other	86	-		86
Total	795_	347	1,875	2,670

Table 8-20-7 Production Cost of Sorghum per ha.
-Maket Price - Unit: M\$

•		Family Labo	r	
Item	Materials	Labor days	Wage	Total COst
		*****	· · · · · · · · · · · · · · · · · · ·	_ ~~~~~~~
1.Land preparation	-	••	_	250
2.Liming	42	3	27	69
3.Seedling	112	10	90	202
4.Fertilizer	339	8	72	411
5.Pest control	60	. 5	45	105
6.Weeding	58	3	27	85
Harvesting	<u>-</u>	10	90	90
Total	611	39	351	1,212

Table 8-20-8 Production Cost of Sorghum per ha.
-Economic Price - Unit:M\$

Family Labor

Item	Materials	Labor day	s Wage	Total COst
1.Land Preparation	-	•••	· _	215
2.Liming	36	. 3	-16	52
3.Seedling	96	10	54	150
4.Fertilizer	292	8	43	335
5.Pest control	52	5	27	79
6.Weeding	50	3	16	66
7.Harvesting	••	10	54	54
Total	526	39	210	951

Table 8-20-9 Production Cost of Cabbage per ha.
-Economic Price - Unit:M\$
Family Labor

Item	Material	Labor days	Wage	Total Cost
1.Land preparation	••	40	360	360
2.Nursery bed	-	12	108	108
3.Seed 1/	90	•	_	90
4.Mengubah anak benil	1 -	25	225	225
5.Watering	- 1	12	108	108
6.Fertilizing (6x)2/	2,137	17	153	2,290
7.Pest control	937	40	360	1,295
8.Weeding	-	7	63	63
9.Mengganti pokok mat	i -	7	63	63
10.Harvesting and				- -
prepare for selling	1g -	10	90	90
Total	3,162	170	1,530	4,692

Note: 1/0.2 kg x M = 90/200 gm = M = 90

2/ Humus 5MT x M\$ 100/MT Nitrophoska Blue Special 2MT x M\$ 800/MT ,Urea $80 kg \times M$ \$ 460/MT

Table 8-20-10 Production Cost of Cabbage per ha.

- Econo	omic Price -	unit:M\$ Family Lab		•
Item	Materials	Labor_day_	_Wage_	Total Cost
1.Land preparation) <i>-</i>	40	216	216
2.Nursery bed		12	65	65
3.Seed	77	34	-	77
4. Mengubah anak be	enih -	25	135	135
5.Watering	-	12	65	65
6.Fertilizing	1,838	17	92	1,930
7.Pest control	804	40	216	1,020
8.Weeding	· -	7	38	38
9.Mengganti pekok	mati -	· 7	38	38
10. Harvesting & pr	epare	•		
for selling	<u>-</u>	10	54	54
Total	2,719	170	919	3,638
	· · · · ·	: .		

Note: Conversion factor for agricultural inputs is 0.86.

Shadow rate of unskilled labor's wage is M\$9 x 0.6 = M\$5.4Production costs mentioned above tables are estimated using these rates.

Table 8-21 Case - 5 Cropping Area With Project --- Paddy

(unit:ha)

		.*			-									٠
Main Season	1998/99	, 99/2000	1998/99, 99/2000 2000/01,	01/02,	,02/03	03/04	04/05	05/06 - 06/07	-	. 80/20	. 60/80	03/10	10/11 -1	11/12
	693	693	693	693	693	693	693	693	693	693	693	693	693	693
Lemal & Pasir M.	1	ì			ı	ı	į	t	1	1	;			
Sub-total	693	693	693	693	693	693	693	693	693	693	693	693	693	693
North Lemal	ı	2,915	2,915	•	3,280	•	3,280	•	•	_	83,	(1	C.	•
Ulu Lemal	1	3,045	3,045	3,425	3,425	3,425	3,425	3,425	3,425	•	,42	4	4,	
Sg. Bagan	į	1,296	1,296	•	•	45	4		1,458	4		1,458	1,458	1,458
Tase Garu	1	1	ı	1	•		1	1	•	•	.78	,785		
Sg.Sat	,	1	1	1	1	1	ı	1	1	1	,45	458	٠. و	
Panyit	ı	•	ı	ı		ţ	,	ı	1	ı	98	987	1,110	1,110
Kusial	•	1	ı	}	1	L	1	,	1	1	1,000	1,000	1,125	1,125
Total	693	7,949	7,949	8,856	8,856	8,856	8,856	8.856	23,776	29.086	29,086	29,086	29,516	29,516
	-			- 1	1.		١.	٠. ا	1	- 1			.	١.
Off Season	1999	. 2000 . 2001	2001	2002	2003	2004	2005	. 9002	. 2002.	. 2008	5005	. 2010	,2011	.2013
Kemubu	35	35	3\$	35	35	35	35	35	35	75	35	አ ጊ	7.	. ¥
Lemal & Pasir M.	1,540	1,540	1,540.	1,540	1,540	1,540	1.540	1.540	1.540	1.540	1 540	1	, 2	יי מאַט מאַט
Sus-total	1,575	1,575	1,575	1,575	1,575		1,575	1,575	1,575	1,575		1.540		•
North Lensi				. 7	Ċ		•		- ;			2.1	,	,
	I	r	ı	145	541	341	341	341	341	341	341	341	341	341
C. Bear	ı	ı	í	541	341	34]	34]	341	341	341	341	341	341	341
J. Dayaii	۱.	ı	F	134	134	134	134	134		134	134	134	134	134
rase card	į.	ı	ı	1	1		ı	3,374	5,239 5	,239 7	,104	7,104	7,104	7,104
00.001.	r	1	ı	i		ı	ĵ	,	1	ı	144	326	32	S
Fany 1 C	î		r.	ı	,) \(\frac{1}{2}\)	•	i	t	ı	104	227	227	350
NUS1 a 1	1 1	ı	1	t	ì		1	ı	,		750	875	875	000
Total	1,575	1,575	1,575	2,391	2,391	2,391	2,391	5,765	7,630 7	,630 10	4	10,923	10,923	11,352
Grand Total	2,268	9,524	9,524	11,247 1	1,247 1	1,247	11,247	14,621	31,406	31,406	39,579	40,009	40,439	40,868

Table 8-22. Case 5 Cropping Area without Project --- Paddy

(unit: ha)

11/12	1 1	1	$^{\circ}$	ഗ	1,231	M	T)	938	200	9,193	2012		ţ		1	-77	654	•4	€	4			2,283	11,476
10/11	- 1 _{,,} 1	1.	50,	52	1,231	35	38	ന	\circ	9,193	2011		ı	1		437	654	103	800	128	85	75	2,283	11,476
01/60	1 1	;	Ŏ	'n,	1,231	Ŋ	പ്	938	200	9,193	2010		1	i	1	437	654	103	800	128	86	75	2,283	11,476
08/09	1 1	1		'n	1,231	ญ	പ്	938	200	9,193	2009		1	1	•	437	654	103	800	128	86	75	2,283	11,476
07/08	1 1	1	1,057		1,231	*	1	1	1	6,370	2008		1	J	1	437	654	103	800	ı	1.	. 1	1,994	8,364
06/07	. I. J	1	1,057	,52	1,231	, 56	1,	i	t	6,370	2007		ì	ı	1	437	654	103	800	i	ı	1	1,994	8,364
90/50	1 1		1,057	1,522	1,231			1	1	3,810	2006		1			437	654	103	800	•	ı	t	1,994	5,804
04/05	,i 1	g .	1,057	1,522	1,231	1	, 1	3	1	3,810	2005		1	ı	1	437	654	. 103	1	ŧ		1.	1,194	5,004
03/04	t i		1,057	1,522	1,231	;	1	1	ı	3,810	2004		ı	1		437	654	103		j	i	1	1,194	5,004
02/03	1 1	í	1,057	1,522	1,231		1	J		3,810	2003		1		i	437	654	103	1] :			1,194	5,004
01/02	i i	1	50,	1,522	,23	1	1	ı	1	3,810	2002		1		į	437	654	103			1	1	1,194	5,004
1	. 1 1	1	1,057	1,522	1,231	1	1	i	s .	3,810	2001		1	1	ı	437	654	103			ı	*	1,194	5,004
9/2000	1 1	1	1,057	1,522	1,231	. 1	1	1	1	3,810	2000		ı	ı	1	437	654	103	ŀ	1	1	1	1,194	5,004
1998/99 99/2000 2000/01	1 1		1	ı	i		1	1	1	i	1999	,	t	i	i .	437	654	103	i :	1	ı		1,194	1,194
•	X M			•										ir M.										ha)
Main Season	Kemubu Lemal & Pastr M.	Sub-total	North Lemal	Uln Lemal	Sg. Bagan	Tase, Garu	Sg. Sat	Panyit	Kusial	Tota1	Off Season		Kemubu	Lemal & Pasir M.	Sub-total.	North Lemal	Uln Lemal	Sg. Bagan	Tase. Garu.	Sg. Sat	Panylt	Kustal	Total	Grand Total (ha)
회	•		:	١.		.*					Ç	1	. 17		-									σI

Crops
Upland
of the
ο£
Area
Cropped
Case-5
8-22-1
Table

lable 8-22-1		Case-5	Cropp	Cropped Area of		the Upi	the Upland Crops	sdo	٠			
	:										5	Unit:na
	1999	2000	2001	2002	2003	2004	2002	2006	2007	2008	2009	2010
	- 2	_										
Without Project				. 1								
Maize	259	265	272	278	285	292	298	302	311	318	325	330
Groundnuts	340	340	340	340	340	340	340	340	340	340	340	340
Tobacco	1,393	1,423	1,450	1,479	1,507	1,535	1,565	1,593	1,621	1,649	1,677	1,708
Sorghum	ı	ı	ł.	1:	1	1	· 1	ı		1	1	ı
Vegetable	292	292	292	292	292	292	292	292	292	292	292	292
Total	2,284	2,320	2,354	2,389	2,424	2,459	2,495	2,530	2,564	2,599	2,634	2,670
With Project												
Maize	816	821	823	827	830	834	837	1,501	1,503	1,505	1,508	1,511
Groundnuts	2,790	2,790	2,790	2,790	2,790	2,790	2,790	3,290	3,290	3,290	3,290	3,290
Tobacco	3,240	3,255	3,272	3,287	3,303	3,318	3,335	4,127	4,131	4,136	4,840	4,840
Sorghum	ŧ	ı		,	ı	ı		4,570	4,570	4,570	4,570 4	4,570
Vegetable	938	938	938	938	938	938	938	1,399 1,399		1,399	1,633	1,633
Total	7,784	7,803	7,823	7,842	7,861	7,880	7,900	14.j887	14,893		00 15,8	14,900 15,841 15,844

Table 8-23 Case-1 Net Production Value

(Unit: million MS

- Market Price -

*2013 *2014 *2015 *2016 *2017 *2018 *1999 *2000 *2001, *2002*2003*2004 *2005 *2006 *2007 *2008 *2009 *2010 *2011 * 2012

With Project					•	-												
6. P. V.	3.55	3.60	3.66	3.60 3.66 3.74 3.80 3.82	3.82 3.84 3.85 3.87 3.89 3.91 3.93 3.94 3.97	3.85	3.87	3,89	3.91	3.93	3.94	3.97	3,98	3.98 4.00 4.02	4.02	4.04	4.06	4.06
P.C.	2.58		2.58	2.58 2.58 2.58 2.58 2.58	2.58 2.58 2.58	2.58	2.58	.58	2.58	2.58 2.58	2.58	2.58	2.58	2.58 2.58	2,58	2.58	2.58	2.58
N.P.V.	0.97		1.08	1.02 1.08 1.16 1.22 1.24	1.24 1.26	1.27	1.27 1.29 1.31 1.33 1.35 1.36 1.39	1.31	1.33	1.35	1.36	1.39	1.40	1.42	1.44	1.46	1.48	1.48
Without Project		•	,															
G.P.V.	•	t	•	1	• •	1	•		•	,		1	٠	•	4	ł	•	1
P.C.	1	•	î	1	•	t.	1	1.	•	ı	•	•	٠.	ı	•	1	•	•
N.P.V.			,	•	1	,		•	: ·,		• 1			•	•			å
Incremental N.P.V.	0.97	0.97 1.02	1.08	1.16 1.22	1.24 1.26 1.27	1.27	1.29	1.29 1.31	1.53	1.35	1.35 1.36 1.39	1.39	1.40	1.40 1.42	1.44	1.46	1.48	1.48
						•								•	.:			
							;			٠.			•		. •			
	1 12 12		·	Table 8-24.		Case-2	NET P	Næt Production Value Market Price	ice -	g g		<u> </u>	(Mat: milion Ma)	K K	· ·	,		

27.36 16.87 10.49 5.54 4.00 1.54 8.95 27.31-16.87 10.44 5.54 4.00 1.54 8 10.40 27.27 16.87 5.54 4.00 1.54 2016 8.87 27.20 10.33 212 5.53 4.00 1.53 27.15 16.87 10.28 5.53 4.00 1.53 8.75 2014 2013 26.75 27.79 26.86 26:90 16.87 16.87 16.87 16.87 9.88 9.92 9.99 10.03 5.53 4.00 1.53 8.50 5.53 4.00 8.46 2007 - 2008 - 3009 - 2010- 2011 - 2012 5.52 4.00 8.40 \$.52 4.00 1.52 8.36 10.03 22.52 22.75 25,54 25.79 26.02 26.27 26.42 26.52 26.63 26.68 6.52 15.27 15.27 16.87 16.87 16.87 16.87 16.87 16.87 3.51 7.25 7.48 8.67 8.92 9,15 9.40 9.55 9.65 9.76 9.81 5.49 4.00 1.49 8.32 5.45 4.00 1.45 8.33 5.41 8.24 5.38 4.00 1.38 8.17 2006 5.33 5 4.00 1.33 8.07 2004 2005 5,27 7.88 5.22 2003 5.17 7.50 2002 5.11 1.19 6.37 2001 5.06 4.00 1.06 6.19 1999 2000 1.42 Incremental N.P.V. 3.21 Without Project With Project 2 0 × U > 0. 0. 22 ر 2 م ر

With Project G.P.V. 12.83 26.62 26.89 30.27 30.56 30.85 31.14 49.77 79.47 80.17 98.02 99.24 100.26 101.05 101.25 101.73 101.95 102.25 102.44 102.72 B.76 18.03 18.03 20.09 20.09 20.09 32.80 56.44 56.45 63.94	14. 14. 14. 14. 14. 14. 14. 14. 14. 14.	1999 2000 , 2001 2002 2003, 2004, 2005, 2006 2007 , 2008 2009 2010 2011 2012 , 2013 2014 , 2015 , 2016 , 2017 , 2018	. 2003	2002	2003	2004	2005	2006	2007	8002	5003	0102	2011	2012	2013	2014	2015	.2016	2017	2018
· · · · · · · · · · · · · · · · · · ·																				
>	-	83 26.62	26.89	30.27	30,56	30.85	31.14	49.77	79.47	30.17	98.02	99.24	100.26	101.05	101.25	101.73	101.93	102.23	102,44	102.72
>		76 18.03	1 18.03	20.09	20.09	20.09	50.09	32.80	56.44	56.44	52.96	53.45	63.94	63.94	63.94	63.94	63.94	63.94	63.94	63.94
>		07 8.59	38.86	10.18	10.47	10.76	11.05	16.97	23.03	23.73	35.06	35.79	36.32	37.11	37.31	37.79	37.99	38.29	38.50	38.78
>							:	٠						٠		٠				
>		90 7.12	7.20	7 23	7.35	7,43	7.51	8.82	12.56	12.64	17.93	17.99	18.05	18.06	18.06	18.07	18.07	18.08	18.08	18.09
		55 6.49	6.49	6.49	6.49	6.49	6,49	7.53	10.85	10.85	14.88	14.88	14.88	14.88	14.38	14.88	14.88	14.38	14,88	14.88
		35 0.6	5 0.71	0.74	0.36	0.94	1.02	1.29	1.71	1.79	3.05	3.11	3.17	3.18	3.18	3.19	3.19	3.20	3.20	5.27
	Lncremental N.P.V. 3.	72 7.96	8.15	9.44	9.61	9.82	10.03	15.68	21.32	21.94	32.01	32.68	33.15	33.93	34.13	34.60	34.80	32:03	35,30	35.57

(Unit: million M\$)

Net Production Value - Market Price -

Case-3

Table 8-25

	1999	2000	2001	2002	1999 2000 2001 2002 2003 2004 2005	2005	2006	2007	2008	2009	2010 2011		2012 2	2013	2014	2015	2016	2017	2018	
With Project . G.P.V.	12.83 8.76 4.07	26.62 18.03	26.89 18.03	30.27 20.09	12.83 26.62 26.89 30.27 30.5630.85 8.76 18.03 18.03 20.09 20.0920.09 4.07 8.59 8.86 10.18 10.4710.76	51.14 20.09 11.05	37.67 24.45 13.22	47.95 31.00 16.95	48.30 31.00 17.30	58.59 37.31. 21.28	59.44 37.66 21.78	37.67 47.95 48.30 58.59 59.44 60.13 62.57 24.45 31.00 31.00 37.31.37.66 38.00 38.46 13.22 16.95 17.30 21.28 21.78 22.13 24.21		62.67 38.36 24.31	62.99 38.36 24.63	63.09 38.36 24.73	63.23 38.36 24.87	63.35 38.36 24.97	63.45 38.36 25.09	
Without Project G.P.V.	1.90	7.12	7.20	7.23	7.12 7.20 7.23 7.35 7.43 6.49 6.49 6.49	7.51	8.82	12.56 7.53	12.64 10.85	17.03 10.85	17.09	8.82 12.56 12.64 17.03 17.09 17.14 17.15 6.49 7.53 10.85 10.85 14.14 14.14 14.14	151.	17.15	17.16	17.17	17 17	17.18	17.18	
N.P.V. Incremental N.P.V.			0.63	9.44	0.63 0.74 0.86 0.94 8.23 9.44 9.61 9.82		$\frac{1.29}{11.93}$	1.71	1.79	2,89	2.95	1.02 1.29 1.71 1.79 2,89 2.95 3.00 3.01 10.03 11.93 15.24 15.51 18.39 18.83 19.13 21.20		3.01	3.02	3.03	3.03	3.04 21.93	3.04	

(Unit: million M\$)

Case-4 Net Production Value

- Market Price -

[ab]e 8-27 Case-5 Gregs Production Value, Production Cost and Net Production Value -- Market Price-

1999 2000	With Project G.P.V.: 3.56 15.7	Upland Crop29.75 51.8	Total 55.29 47.55	P.C. :	Paddy 2.58 10.82	Upland Crop23.79 25.86	Total 26.37 34.68	N.P.V. 6.92 12.90	Without Project	G.P.V. :	Paddy 1.90 7.1	Upland Crop 8.59 8.73		P.C. :	Paddy 1.55 6.4	Upland Crop 7.98 8.11	Total (.55 14.6	N.P.V.: 0.96 1.2	N.P.V. 5.96 11.65 14.00 16.24 18.07
3001	15.72 5.93 19.14 19.58	31.86 34.14	5 50.07								7.12 7.20	5 8.84	15.85 16.04		61.49 61.49	3.33	14.60 14.72 14.85 14.97	1.25 1.32 1.35	5 14.00
2002	19.14	55.22	50.07 54,36		10.82 12.78 12.78	25.95 25.99 24.06	34.75 36.77 36.84	15.32 17 59		:5	7.20 7.23	5.97	16.02				14.85	1.55	16.24
2003	19.58	37,01	56.59		12.78	24.06	36.84	19.53			7.35	9.10	16.45		67.9 67.0	3.43	14.97	1.43	18.07
2004	19,51	37.10	36.67		12.78	24.13	36.91	19 76			7,43	9.22	16.65		6.49	8.50	15.09	1.56	18.20
2005	19.77	37,19	56.96		12.73	34.30	36.98 5	19.98	٠	·	7.51	9.36	16.37 1		67.4	30 10	15.22	1.65	18.53 3
2006	35.46	. 55.00	36.01		16.61	36.95	53.56 7	32.45 4	٠		8.82	81.6	13.30		7.55 1	8.85	16.38 1	1,92	30.53. 4
2007	55.00	60.57	15.17		55.08	56.97	72.65	42.92			12.56	9.61	22.17		10.85	8.97	28.61	3.5	10.57
2008	55.51	90.09	16.11		35.68	36.97	72.65	13.46			12.64	9.73	22.57		10.85	9.10	19.95	2.12	11.04
3009	70.23	66.18	36.01 115.17 116.11 136.41 157.45		44.96	10.97	85.93	50.48			17.93	9.36	27.75		14.38	6. 6	24.10	5.69	16.79
2010	71.26	66.19	37.45 1	:	15.45	10.97	36.42	51.03			17.99	9.98	75.97		14.58	9.35	24,23	77.15	47.29
1011	12.13	61.40	58.57 1	÷	15.94	10.97	86.91	51.41		٠	18.05	66.6	38,04		14.58	9.55	24.23	5.31	17.60
2012	73.09	66.19	158.52 159.28 159.58 159.52 159.62		16.43	10.97	87.40	51.88			18.06	66.6	23.05		88 +1	9.33	24.23	3.82	48.06
2013	73.19	66.19	39.38 1		46.43	10.01	37.10	51.98			18.06	66.6	28.05		14 88	9.55	24.23	3.82	13.16
1017	: 15 15 15 15 15 15 15 15 15 15 15 15 15 1	61.00	39.52		16.45	76.01	87,40	52.12			18.07	66.6	28.06		11 38	5.5	24.33	3.83	48.29
2015	73,45	66.19	139.62		16.45	10.97	87.10	52.23			18.08	66.6	28.07		11 88	50.0	14.23	5.84	12.87
2016	55 50 50	50.19	139.77		46.43	10.97	87, 40	52.37			13.08	9.99	28.07		1 4 888 4 4 888	9 55	14.23	5.84	18.55
2017	75.68	61.39	139.87		16.43	10.97	87.40	52.47			18.03	66.6	23.07		14 88	9.55	24.23	5.84	48.55
2013	73.80	66.19	66 65 1		46.43	10.97	87.10	52.59			18.09	9.99	28.03		1.4 \$8	9.33	13.	3.85	18.74

				Table 6-48. Case-1	× 27-2	-ase		2 0 0	Produc Economi	Net Production Value - Economic Price-	atue :e-		: 1 km	m1111((&w william with the control of the	_				
											•	٠.								
					è						· .			:	1					
	1999	19992000 2001 ,2002 ,2003 ,2004 ,2005 ,2006 2007 .2008 ,2009 2010 2011 2012 2013 2014 2015 2016 <u>2017 2018</u>	2001	2002	,2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
With Project			•		v		4.2							•				٠.		
G.P.V.	2.81		2.83 2.88 2.94	2.94	2.99	3.00	3.02	3.03	3.04	3.06	3.07	3.09	3.10	3.12	2.99 3.00 3.02 3.03 3.04 3.06 3.07 3.09 3.10 3.12 3.13 3.15 3.16 3.18 3.19 3.19	3.15	3.16	3.18	3.19	3.19
٠.٠	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94 1.94 1.94 1.94 1.94 1.94	1.94	1.94	1.94	1.94	1.94 1.94 1.94 1.94	1.94	1.94	1.94 1.94	1.94	1.94
N. D. V.	0.87	0.89	0.89 0.94 1.00	1.00	1.05	1.06	1.08	1.09	1,10	1.12	1.13	1.15		1.18	1.19	1.21.	.1.22	1.24	1.25	1.25
Without Project				`'			•				¥.							٠		
G. P. V.	•	1	ľ	•	. •	a	,		•	•	•		ı	,	1	•	•	•	i	•
ບໍ່	•	•	1	•	•	ŧ	1	ı	•	1			•		•	•	•	ı	ł	•
X O X	•	•	•	•	1	•		•	•	F		1	ţ	1	•	•		•	,	
Incremental N.P.V. 0.87	. 0.87	68.0	0.89 0.94 1.00 1.05 1.06 1.08 1.09 1.10 1.12 1.13 1.15	1.00	1.05	1.06	1.08	1.09	1.10	1.12	1:13	1.15	1.16	1.18	1.16 1.18 1.19 1.21 1.22 1.24 1.25 1.25	1.21	1.22	₹.24	1.25	1.25

	1999	2000	2001	200.2	200.3	200:4	200.5	20016	200;	2008	2009	2010	2011	1999 2000 2001 200,2 200,3 200,4 200,5 200,6 200, 2008 2009 2010 2011 2012 .2013 2014 2015 2016 2017 2018	2013	2014	2015	2016	2017	2018
With Project																				
G.P.V.	7.88	17.70	17.88	20.07	20.27	20.45	20.65	20.77	20.85	20.93	20.97	21.07	21,06	21.11	21.14	21.34	21.38	21.43	21.47	21,50
ับ ผ	6.9	11.53	11.51	12.78	12.78	12.78	12.78	12,78	12.78	12.78	12.78	12.78	12.78	4.91 11.51 11.51 12.78 12.78 12.78 12.78 12.78 12.78 12.78 12.78 12.78 12.78 12.78 12.78 12.78 12.78 12.78 12.78 12.78 12.78	12.78	12.78	12.78	12.78	12.78	12.78
N.P.V.	2.97	2:97 6.29 6.37 7.29 7.49 7.67 7.87 7.99 8.07 8.15 8.19 8.24 8.28	6.37	7.29	7.49	7.67	7.87	7.99	8.07	8.15	8.19	8.24	8.28	8.33 8.36 8.56	8.36	8.56	8.60	8.60 8.65 8.69	8.69	8.72
Without Project					•															
G.P.V.	1.35	3,98	3.98 4.02 4.06 4.10	4.06	4.10	4.10	4.14	4.19	4.23	4.10 4.14 4.19 4.23 4.26 4.28 4.31 4.34	4.28	4.31	4.34		4.35	4.34 4.35 4.35	4.35	4.35 4.35 4.35	4.35	4.35
3.5	1.02	1.02	1.02	1.02 1.02 1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	2 1.02 1.02 1.02 1.02 1.02 1.02 1.02		1.02 1.02 1.02	1.02	1.02	1.02	1.02	1.02
N. P. V.	0.33	2.96	3.00	3.00 3.04 3.08	3.08	3.08	3.12	3.17	3.21	3.24	3.26	3.29	3.32		3.33	3, 33	3,33	3.33	3,33	3.53
Incremental N.P.V.2.64 3.33	V.2.64	3.33	3.37	4.25	4.43	4.59	4.75	4.82	4.86	3.37 4.25 4.41 4.59 4.75 4.82 4.86 4.91 4.93 4.95 4.96	4.93	4.95	4.96		5.01 5.03 5.23	5.23	5.27	5.27 5.32 5.36	5.36	5.39

(unit: million MS)

Net Production Value -Economic Price-

Table 8-29, Case-2

Table 8-30, Case-3 Net Production Value - Economic Price -

Production Value (Unit: million M\$)

									٠											
	1999	2000	2001	2002	2002	2004	2002	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Mith Project																				
> ů	10.08 20.93 2 6.60 13.59 3	20.93 13.59	22.13	15,14	23,79 24,02 24,24 24,47 39,12 15,14 15,14 15,14 15,14 24,71	24.24 15.14	24.47	39.12 24.71	62.46 63.01 77.04 78.00 78.81 79.42 79.58 79.96 80.12 80.36 39.09 39.09 47.44 47.81 48.18 48.55 48.55 48.55 48.55	63.01	47.44	78.00	78.81 48.18	79.42 48.55	79,58 48,55	19,96	80.12	80.36	48.55	80.73 48.55
N.P.V.	4.48	7.34	7.54	8.65	8.83	9.10	9.33	14.41	23,37	23.92	29.60	30.19	30,63	30.87	31,03	31.41	31.57	31.81	31.96	32.18
Withour Project		• :													: :	-			-	
G. P. V.	1.49		5.66			5.84	. S. 91	96 9		9.91	14.09	14.14	14.19	14.19	14. 20	14.20	14.20	14.21	14 2:	3.
ບໍ່: ຄ. ຄ.	1,12	4.67				.67	4.67			7.81 7.81 10.72 10.72 10.72 10.72 10.72 10.72 10.72 10.72 10.72	10.72	10, 72	10.72	10,72	10.72	10,72	10.72	10.72	10.72	7.01
N. 9. V.	0.37		5	1.01	1:11	77.7	1.24	1.54	2.00	7.10	2.57	3.47	. 4.	3.47	4	5.48	3,48	D	. 55	7
Incremental N.P.V.	4.11	6.41	6.55	7.64	7,77	7.93	8 .09		12.39 21.31 21.82	21.82	26.23	26.77	27.16	26.23 26.77 27.16 27.40	27,55	27,93		28.09 28.32	28.47	28.69
			-																	
							•				-									
	-	ŀ	Table 8-7	<u>.</u>	5	Case-4	ž e	Produc	Net Production Value	'alue	٠		Ž	(Unit: 2	million MS)	(S)			÷	
*		٠.		7		• .	. I	conomi	Economic Price	1			•		ı	•				
	-				. •	•					•									
	1999	2000	2001	2002	2003	2004	2002	2006	2007	2003	2009 2010		2011	2012	2013	2014	2015	2016	2017	2015
Mith Project																				
6.7.4.	10.03	10.08 20.93	21.13	23, 79	24.02	24.24	24.47	29.63	37.69	37.96	46.05	46.72	47.26	49.18	49.26	49.53	49.59	49.70	49.78	49.87
7. P. V.	3.48	3,48 7,34		8 65	13,59 15,14 15,14 15,14 15,14 15,43 23,50 25,50 26,12 26,58 26,50 26,50 26,50 26,50 26,50 26,50 26,50 7,54 8,65 8,65 8,88 9,10 9,33 11,18 14,33 14,60 17,93 18,34 18,62 20,28 20,26 20,61 20,69 20,80 20,88	9.10	9.33	11.18	14:33	14.60	17.95	18.34	18.62	20.28	20.36	20.61	20.69	20.80	20.88	20.68
Mithout Project	-																			
G.P.V.	1.49	5.60					5.9			9.93	13.38	13.43	13.47	13.48	13.48	15.49	13.49	13.50	13.50	13.5
 	1.12	4.67	4.67	1.01		1.17	1.24	5.42		7.81	10.18 3.20	10.18 3.25	3.29	3.30	3.30	7.81 10.18 10.18 10.18 10.18 10.18 10.18 10.18 10.18 10.18 10.18 20.18 2.12 3.20 3.20 3.20 3.30 3.31 3.31 3.32 3.32 3.32 3.32	3.31	3.32	10.18	2 ii
Incremental N.P.V.	3,11	6.41	6,55			7,93	8,03 03	99 6	•	12.48	14.73	15.09	15, 33	16.98	17.06	17.30	17,38	17.38 17.48 17.56 17.56	17.56	17.56

[ab] 6 8-32 Case-5 Gross Production Value.Production Cost and Net Production Value - Economic Price-

	1999	2000	1001	3002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2013	
With Project																					
G P V :																					
Paddy	5.02			16.23	16.44	16.60	16.77	21.39	10.64	17.07			01.10				62.27	62.39	62.48	62.58	
Upland Crop	25.93	25.64	27.19	18.34	29.78	29.85	29.92	18.66	13.68	18.71	55.01									55.01	
Total	26.95	58.97	11.00	14.57	16.22	16.45	16.69	70.25		95.78 1	12.57 1	15.45 1	14.17 1	14.99		15.20 1	15.23	15.40 1		15.59	
	;																				
Paddy	1.94	8.15	8 11.00	9.63	9.63	9.63	9.63	12.52			55.38			34.98	54.98	34.98	34,98	54.98	34.98	34.98	
Upland Crop	16.53	16.37	16.42	16.46	16.51	16.55		25.89			28.61				18.62		23.62	28:62	28.62	28.62	
Total	13.27	24.52	24.57	26.09	26.34	26,18	36.13	38.41	52.78		62.19		65.24	65.60	63.60	63.60	63.60	63.60	65.60	93.50	
N. P. V	8.68	14.45	16.43	18.13	20.03	20.27	20.46	31.84					50.93	51,39	51.47	51.60	51.68	51.80	51.39	51,99	
Without Proje	100												•								
G.P.V.		1.								, ,		1								•	
Paddy	1.61	6.04	h.11	6.15	5.24	6.30	6.37	7.48	10.65	10.72			15.31	15.31	15.32	15.52	15.33	15.33	15.33	15.34	
Upland Crop	6.91	7.01	7.11	7.21	7.52	7.42	7.32	7.62	7.72	7.82	7.93	8.03	8.03	8.03	3.03	8.03	8.03	8.03	8.03	8.03	
Total	8.52		15.22	13.34	13.56	13.72	13.99	15.10	18.37			23,29	33.54	23.34	25.55	23.33	23.36	25.56	25.56	25.37	
P.C.		,					•														
Paddy	1.12	1.67	1.67	1.67	4.67	1.0.1	1.07	5.42	7.81	7.81				10.72	10.72	10.72	10.72	10.72	10.72	10.72	
Upland Crop	5.37	2.40	5.54	5.62	5.70	5.78	5.36	5.94	6.02		6.19	6.27	6.27	6.27	6.27	6.27	6.27	6.27	6.27	0.27	
Total	6.19	10.13	10.21	10.29	10.37	10.15	10.33	11.36	13.83		16.91		16.99	16.99	16.99	16.99	16.99	16 99	66 97	16 99	
N P.V.	2.03		3.01	3.05	5.19	13.7	3.46	3.74	1.5.1	1.6.5	6.23	6.30	6.33	6.35	95.0	6.36	6.37	6.37	6.37	6.38	
[neremental											4										
N.P.V.	6.65	11.55	15.42	5.43	16.89	17.00	17.00	28.10	38.00	38.36			11.58	45.04	15.11		48.31	45.43	45.52	19.25	•
	With Project G.P.V.: Paddy Upland Crop Total P.C.: Paddy Upland Crop Total N.P.V.: Without Proje G.P.V. Paddy Upland Crop Total P.C. Paddy Upland Crop Total N.P.V. Incremental N.P.V. Incremental	With Project G.P.V.: Paddy 5.02 Upland Crop 25.95 Pocal 26.95 Poc.: Paddy 1.94 Upland Crop 16.55 Total 13.27 N.P.V.: 8.68 Without Project G.P.V. Paddy 1.61 Upland Crop 6.91 Total 8.52 P.C. Paddy 1.12 Upland Crop 6.91 Total 8.52 P.C. Paddy 1.12 Upland Crop 6.91 Total 8.52 P.C. Paddy 1.12 Upland Crop 6.91 N.P.V. 2.03	With Project G.P.V.: Paddy 5.02 15.53 Upland Crop 25.95 25.64 Total 26.95 38.97 P.C.: Paddy 1.94 8.15 Upland Crop 16.53 16.57 Total 13.27 24.52 N.P.V.: 8.68 14.45 Without Project 6.91 7.01 Total 8.52 15.05 Paddy 1.61 6.04 Upland Crop 6.91 7.01 Total 8.52 15.05 P.C. Upland Crop 6.91 7.01 Total 6.49 10.15 N.P.V. 2.03 2.92	With Project G.P.V.: Paddy 3.02 15.55 15.51 Upland Crop 25.95 25.64 27.49 Total 26.95 38.97 41.00 P.C.: Paddy 1.94 8.15 3.15 Upland Crop 16.55 16.57 16.42 Total 13.27 24.52 24.57 N.P.V.: 8.68 14.45 16.45 G.P.V. Paddy 1.61 6.04 6.11 Upland Crop 6.91 7.01 7.11 Total 8.52 15.05 15.22 P.C. Paddy 1.15 4.67 Upland Crop 5.37 5.46 5.54 Total 8.52 13.05 15.22 N.P.C. Paddy 1.15 4.67 4.67 Upland Crop 5.37 5.46 5.54 Total 6.49 10.15 10.21 N.P.V. 2.03 2.92 3.01	.02 15.53 15.51 16.23 .93 25.64 27.49 28.34 .95 38.97 41.00 44.57 .94 8.15 8.15 9.65 .53 16.57 10.42 16.46 .27 24.52 24.57 26.09 .68 14.45 16.45 18.48 .61 6.04 6.11 6.15 .52 15.05 15.22 15.54 .91 7.01 7.11 7.21 .52 15.05 15.22 15.54 .99 10.15 10.21 10.29 .03 2.92 5.01 5.05	16.23 16.23 16.24 16.24 16.24 16.23 16.29 16.29 16.29 16.23 16.23 16.23 16.23 16.23	16.23 16.44 16.60 28.54 29.78 29.85 44.57 46.22 46.45 9.65 9.65 9.65 16.46 16.51 16.55 26.09 26.14 26.18 18.48 20.08 20.27 6.15 6.24 6.50 7.21 7.52 7.42 15.54 15.56 15.72 4.67 4.67 5.62 5.70 5.78 10.29 10.37 10.45 5.05 5.19 5.27	16.23 16.44 16.60 16.77 28.54 29.78 29.85 29.92 44.57 46.22 46.45 46.69 26.09 26.14 26.18 26.23 18.48 20.08 20.27 20.46 6.15 6.24 6.50 6.57 7.21 7.52 7.42 7.52 15.54 15.56 15.72 15.99 1.67 4.67 4.67 4.67 5.62 5.70 5.78 5.86 10.29 10.37 10.45 10.55 5.05 3.19 3.27 5.46	16.23 16.44 16.60 16.77 21.39 18.34 29.78 29.85 29.92 48.66 14.57 46.22 46.45 46.69 70.25 16.46 16.31 16.55 16.60 25.89 26.09 26.14 26.18 26.23 38.41 18.48 20.08 20.27 20.46 31.84 6.15 6.24 6.30 6.57 7.48 7.21 7.32 7.42 7.32 7.62 15.54 15.56 15.72 15.99 15.10 4.67 4.67 4.67 4.67 5.42 5.62 5.70 5.78 5.86 5.94 10.29 10.57 10.45 10.53 11.36 5.05 3.19 3.27 5.46 5.74	16.23 16.44 16.60 16.77 21.59 46.64 28.34 29.78 29.85 29.92 48.66 48.68 44.57 46.29 70.25 95.52 95.52 96.53 46.59 70.25 95.52 96.53 96.5 16.60 25.89 25.90 26.09 26.14 26.18 26.23 35.41 52.78 18.48 20.08 20.27 20.46 31.84 12.54 12.54 15.56 15.56 15.54 15.56 15.54 15.56 15.57 7.21 7.52 7.42 7.52 7.62 7.72 15.59 15.10 18.37 1.67 1.67 1.67 1.67 1.67 1.67 1.67 1.6	16.23 16.44 16.60 16.77 21.39 46.64 47.07 28.54 29.78 29.85 29.92 48.66 18.68 48.71 44.57 46.29 70.25 95.52 95.78 9.63 9.63 9.63 9.63 9.63 9.63 9.63 9.63	16.23 16.44 16.60 16.77 21.39 46.64 47.07 28.54 29.78 29.85 29.92 48.66 18.68 48.71 44.57 46.29 70.25 95.52 95.78 9.63 9.63 9.63 9.63 9.63 9.63 9.63 9.63	16.23 16.44 16.60 16.77 21.39 46.64 47.07 28.54 29.78 29.85 29.92 48.66 18.68 48.71 44.57 46.29 70.25 95.52 95.78 9.65 9.65 9.65 9.65 9.65 9.65 9.65 9.65	16.23 16.44 16.60 16.77 21.39 46.64 47.07 28.54 29.78 29.85 29.92 48.66 18.68 48.71 44.57 46.29 70.25 95.52 95.78 9.65 9.65 9.65 9.65 9.65 9.65 9.65 9.65	16.23 16.44 16.60 16.77 21.39 46.64 47.07 59.56 60.42 61.16 61.98 18.34 16.44 16.60 16.77 21.39 46.64 47.07 59.56 60.42 61.16 61.98 18.34 19.48 18.68 18.68 18.71 55.01 55.01 55.01 14.57 16.22 46.49 70.25 95.52 95.78 112.57 113.43 114.17 114.99 9.65 9.65 9.65 9.65 12.52 26.88 55.81 28.01 55.01 55.01 55.01 16.46 16.51 16.55 16.60 25.89 25.97 26.49 62.87 51.42 51.60 28.62 28.62 26.09 26.14 26.18 26.25 95.52 95.78 115.57 114.17 114.99 16.49 16.51 16.51 16.52 16.43 26.19 26.19 26.19 26.19 26.19 2	16.23 16.44 16.60 16.77 21.39 46.64 47.07 39.56 00.42 01.16 01.98 02.06 28.52 19.53 16.44 16.60 16.77 21.39 46.64 47.07 39.56 00.42 01.16 01.98 02.06 28.53 14.57 16.22 46.69 70.25 95.73 112.57 113.43 114.17 114.99 115.07 25.01 2	16.23 16.44 16.60 16.77 21.39 46.64 47.07 39.56 00.42 01.16 01.98 02.06 28.52 19.53 16.44 16.60 16.77 21.39 46.64 47.07 39.56 00.42 01.16 01.98 02.06 28.53 14.57 16.22 46.69 70.25 95.73 112.57 113.43 114.17 114.99 115.07 25.01 2	16.23 16.44 16.60 16.77 21.39 40.64 47.07 39.56 60.42 01.16 61.98 62.06 62.17 20.18 14.37 15.20 14.64 17.07 39.56 60.42 01.16 61.98 62.06 62.19 62.27 18.34 19.54 19.64 17.07 39.56 60.42 01.16 61.98 62.06 62.19 62.27 18.34 19.55 19.55 19.55 19.55 19.55 19.50 18.50	16.23 16.44 16.60 16.77 11.39 49.64 47.07 39.56 60.42 61.16 61.98 62.06 62.19 62.17 62.39 18.34 18.66 18.68 48.68 48.68 18.68 18.71 53.01	16,23 16,44 16,60 16,77 21,39 46,64 47,07 59,56 00,42 01,16 01,93 02,06 02,19 02,27 02,39 02,48 13,54 12,57 13,59 46,64 47,07 59,56 00,42 01,16 01,93 02,06 02,19 02,27 02,39 02,48 13,54 13,57 13,59 13,50	16,23 16,44 16,60 16,77 11,39 46,64 47,07 39,56 90,42 91,16 91,98 92,06 92,19 92,27 92,39 62,48 92,57 62,39 92,32 48,66 47,07 39,56 90,42 91,16 91,98 92,06 52,01 55,01

Unit Capital Cost of Main Pump Station in 1977 Year's Price fable 8-33

- ENEX, KRBS

	Peak Water	Main P.S.	Capital		
KRBS Project	Demand Qp (m /s)	Head H (m)	Cost M\$1,000	Irrigation Area (ha)	Unit Cost M\$/ha
orth Lemal	10.9	7.2	2,836	9,265	306
Ilu Lemal	9.4	12.0	1,995	7,371	271, Average
oper Ulu Lemal	7.0	16.0	231	758	305) 274
g. Bagan	2.5	11.0	994	4,281	232
asek Garu	15.9	14.0	8,044	18,650	431
g. Sat	3.5	16.5	2,087	6,652	314
ertok & Putat Ex. (Panyit)	1°1	12.0	477	1,491	320

Name of KRBS Projects are based on the ENEX Main Report Vol.2: Drainage and Irrigation, Chapter 5. Irrigation Project. Page 23 - 29.

Peak water demand and irrigable area are based on Table 5.2, ENEX Main Report Vol. 2.

ENEX Main Report Vol.2. Appendix 2. Pumping installation design parameters:-Capital cost of main pump station is estimated using the following method. The Capital cost of a pump station was assumed to be directly proportional to the installed power capacity of the plant.

Installed power = Qc x H x g/Ep

= 2,360 x Qc x H x g/EP = 2,360 x (Qp/0.8) x H x 9.8/0.8 = M\$36,138 x Qp x H (QP: peak irrigation demand) Qc: installed pumping capacity $\{m^3/s\}$, H: pumping head (m) g: gravitational constant $\{m/s^3\}$, Ep: pumping efficiency (%)Capital cost equations = unit capital cost x Qc x H x g/Ep Unit capital cost = model P.S cost M\$/installed power KW

Table 8-34 Reticulation System Unit Costs in 1977 Year's Price - ENEX, KRBS -

KRBS Project	(M\$	Unit Costs per ha Gross Scheme Area)
North Lemal Ulu Lemal Upper Ulu Lemal	3,035 x 0.4	(bris soil) + 2,455 x 0.6 = 2,687 2,455 2,455
Sg. Bagan Tasek Garu Sg. Sat	3,035 x 0.16	2,455 (bris soil) + 2,455 x 0.84 = 2,548 2,455
Pertok & Putat Ex.	(Panyit)	2,455

Note: Basin irrigation reticulation system costs are based on the ENEX Main Report Vol.2: Drainage and Irrigation, Appendix 8.

Co	st (\$ per ha Gross Scheme Area)
Electrical and mechanical	90
Civil	
Primary, secondary and tertiary canals (unlined)	469
Primary, secondary and tertiary canals (lined) $\frac{1}{2}$	836
Primary, secondary and tertiary drains	44
Canal structure	379
Drain structure	219
Bridges	23
Operation and maintenance facilities	45
Sub-total (unlined canals)	1,269
x 1.58 multiplier ^{2/}	2,005
Sub-total (lined canals)	1,636
x 1.58 multiplier ²	2,585
Land acquisition (4.5% gross scheme area)	450
Total (unlined canals)	2,455
Total (lined canals)	3,035

^{1/:} Based on earth lining

^{2/:} Multiplier covers preliminaries and unscheduled items (20%), contingencies (20%), design and supervision (20%)

Table 8-35 On-Farm System Unit Costs in 1977 Year's Price - ENEX, KRBS -

KRBS Project	Unit Costs (M\$ per ha Irrigation)
North Lemal	833×0.4 (bris soil) + $445 \times 0.6 = 601$
Ulu Lemai	455
Upper Ulu Lemal	455
Sg. Bagan	455
Tasek Garu	833×0.16 (bris soil) + 445 x $0.84 = 507$
Sg. Sat	455
Pertok & Putat Ex.(1	Panyit) 455

Note: On-Farm system unit costs are based on the ENEX Main Report Vol.2: Drainage and Irrigation, Appendix 9.

- 1. Distribution systems are classified by flood, furrow, sprinkler and trickle irrigation type.
- 2. Costs component consist of unlined or lined canal (class 1, 2 and 3), drains (class 1, 2 and 3), structures (turnouts, flow, water level) and land acquisition.
- 3. Costs include the preliminaries & unscheduled items of 20%, contingency of 20% and survey, design & supervision of 10%.
- 4. Distribution system costs are tabulated as follows.

\$ per ha irrigated	Unlined Canals	Lined Canals
Flood	445	833
Furrow	1,507	2,863
Sprinkler	2,387	3,448
Trickle	2,869	3,930

Table 8-36 Operation and Maintenance Unit Cost in 1981 Year's Price
- KADA II East Bank Area -

			Conversion	•
	Item	Financial Cost	Factor	Economic Cost
1.	Labour Cost	M\$1,000		M\$1,000
	Canal	703		
	Farm Road	442		
	On-Farm	804		
	Sub-Total	1,949	0.6	1,169
2.	Pump			
	(Kemubu, Booster	, Salor) 365	0.8	292
	Total	2,314		1,461
	Irrigable Area	20,092 ha		20,092 ha
	O & M Cost/ha	115 M\$		73 M\$

Note: Depreciation cost of equipment is excluded because of estimation of replacement costs of pump.

Source: Final Report, KADA II Improvement Project, Kelantan, MOA, Malaysia, 1982, Page 4.7.

Table 8-37 Consumer Price Index, Peninsular Malaysia

			Price Index
Basic Year	Year	Price Index	1986/1977
1967	1967	100.0	
	1970	101.3	
	1975	144.0	•
	1976	147.7	•
	1977	154.8	100.0
	1978	162.4	
	1979	168.3	
	1980	179.5	115.95 (179.5/154.8)
1980	1980	100.0	
	1981	109.7	
	1982	116.1	
٠	1983	120.4	•
	1984	125.1	
	1985	125.5	
	1986	126.8	147.0 (115.95x126.8)

Table 8-38 Capital Cost in 1977 Year's Price - Market Price

Irrigation Project		Main Pump	Station	Reticulati	on System	On-Farm Sy	stem Cost	٠.
	Irrigable	Capital	Capital		Capital		Capital	
r C	Area	Unit Cost	Cost	Unit Cost	Cost	Unit Cost	Cost	Total Cost
	(ha)	(M\$/ha)	(M\$1,000)	(M\$/ha) (M\$1,000)	(M\$1,000)	(M\$/ha) (M\$1,000) (Y	(M\$1,000)	(M\$1,000)
North Lemal Phase I	3,644	306	1,115	2,687	9,791	601	2,190	13,096
Ulu Lemal		274	1,043	2,455	9,344	445	1,693	
Sg. Bagan	1,620	232	376	2,455	3,977	445	721	
Tasek Garu	18,650	431	8,038	2,548	47,520	507	9,456	
Sg. Sat	1,822	314	572	2,455	4,473	445	811	
Panyit	1,234	320	395	2,455	3,029	445	549	
Kusial	1,250	320	400	2,455	3,069	445	556	
Total	32,060		11,939		81,203		15,976	

Table 8-39 Operation and Maintenance Cost in 1981 Price - Market Price -

(unit: M\$1,000)

Project	Irrigable Area		O & M Cost
	(ha)	(M\$/ha)	(M\$1,000)
North Lemal Phase I	3,644	115	419
Ulu Lemal	3,806	115	438
Sg. Bagan	1,620	115	186
Tasek Garu	18,650	115	2,145
Sg. Sat	1,822	115	210
Panyit	1,234	115	142
Kusial	1,250	115	144
Total	32,060		3,684

Table 8-40 Capital Cost in 1986 Year's Price

- Market Price -

(unit: M\$1,000)

Irrigation Project Associated with Lebir Dam Project	Capital Cost in 1977 Prices	Price Index 1986/1977	Capital Cost in 1986 Prices
North Lemal Phase I	13,096	1.47	19,251
Ulu Lemal	12,080	1.47	17,758
Sg. Bagan	5,074	1.47	7,459
Tasek Garu	65,014	1.47	95,570
Sg. Sat	5,856	1.47	8,608
Panyit	3,973	1.47	5,840
Kusial	4,025	1,47	5,917

Table 8-41 Operation and Maintenance Cost in 1986 Year's Price

- Market Price -

(unit: M\$1,000)

Irrigation Project Associated with Lebir Dam Project	O & M Cost in 1981 Price		O & M Cost in 1986 Prices
North Lemal Phase I	419	1.16	486
Ulu Lemal	438	1.16	508
Sg. Bagan	186	1.16	216
Tasek Garu	2,145	1.16	2,488
Sg. Sat	210	1.16	244
Panyit	142	1.16	165
Kusial	144	1.16	167

Table 8-42 Economic Capital Cost in 1986 Year's Price

(unit: M\$1,000)

	Fi	nancial (Cost	Ec	onomic Co	ost
Project	F.C	L.C	Total	F.C	L.C	Total
North Lemal Phase I	7,700	11,551	19,251	7,700	8,894	16,594
Ulu Lemal	7,103	10,655	17,758	7,103	8,204	15,307
Sg. Bagan	2,984	4,475	7,459	2,984	3,446	6,430
Tasek Garu	38,228	57,342	95,570	38,228	44,153	82,381
Sg. Sat	3,443	5,165	8,608	3,443	3,977	7,420
Panyit	2,336	3,504	5,840	2,336	2,698	5,034
Kusial	2,367	3,550	5,917	2,367	2,734	5,101

- Note: 1. Ratio between foreign currency and local currency is assumed at 40% and 60% based on KADA II Main Report, Table 4-24, Page 4-123.
 - 2. Conversion factor for construction cost to be used in local currency is 0.77.
 - 3. F.C: Foreign Currency L.C: Local Currency

Table 8-43 Economic O & M Cost

(unit: M\$1,000)

Project	Financial Cost	Economic Cost
North Lemal Phase I	486	389
Ulu Lemal	508	406
Sg. Bagan	216	173
Tasek Garu	2,488	1,990
Sg. Sat	244	195
Panyit	165	132
Kusial	167	134

Note: Economic costs are estimated using general conversion factor of 0.8.

Table 8-44 Economic Analysis --- Market Price Base (Case 5) (unit: M\$ million)

Project Year Cost		2		- ·	m 9	*		***	
1. 1994	Project	Project	0 & M	Repl.	Total	Incre.	Tamadda.		
2. 1995 11.115	Ital		COST	Cost	CORE	MLA	peneric	10%	176
3. 1996 11.115 - 11.115 - 11.115 - 11.115 - 11.115 - 5.733 - 5.543 5. 1998 6.673 6.673 11.115 - 11.115 - 5.733 - 5.543 5. 1998 6.673 6.673 11.115 11.115 - 5.733 - 5.543 5. 1998 6.673 6.673 11.115 - 7.733 - 5.543 5. 1998 6.673 1.342 - 10.892 11.65 0.758 0.238 0.224 8. 2001 9.55 1.342 - 10.892 11.65 0.758 0.238 0.224 8. 2001 9.55 1.342 - 10.892 11.65 0.758 0.238 0.224 8. 2001 9.55 1.342 - 10.892 11.65 0.758 0.238 0.224 8. 2001 9.55 1.342 - 20.442 18.07 - 2.372 - 0.453 - 0.471 11. 2204 25.93 1.342 - 20.442 18.07 - 2.372 - 0.453 - 0.417 11. 2204 25.93 1.342 - 27.272 18.20 - 9.072 - 1.469 - 1.339 12. 2005 18.44 1.342 - 19.782 18.33 - 1.452 - 0.199 - 0.180 13. 2006 4.07 3.830 - 7.900 30.53 22.630 2.632 2.358 14. 2007 6.105 3.830 - 7.920 41.04 33.120 2.766 2.438 16. 2009 - 4.406 - 4.406 46.79 42.384 2.573 2.230 18. 2011 - 4.406 - 4.406 47.60 43.194 2.784 2.732 18. 2011 - 4.406 - 4.406 47.60 43.194 2.794 1.888 19. 2012 - 4.406 - 4.406 48.06 43.654 1.891 1.602 20. 2013 - 4.406 - 4.406 48.06 43.654 1.891 1.602 20. 2013 - 4.406 - 4.406 48.16 43.754 1.597 1.348 21. 2014 - 4.406 - 4.406 48.16 43.754 1.597 1.348 22. 2015 - 4.406 - 4.406 48.83 43.974 1.152 0.959 23. 2016 - 4.406 - 4.406 48.83 43.974 1.152 0.959 23. 2016 - 4.406 - 4.406 48.83 43.974 1.152 0.959 23. 2016 - 4.406 - 4.406 48.74 44.334 0.360 0.807 24. 2017 - 4.406 - 4.406 48.74 44.334 0.360 0.807 25. 2018 - 4.406 - 4.406 48.74 44.334 0.360 0.391 27. 2020 - 4.406 - 4.406 48.74 44.334 0.360 0.391 28. 2021 - 4.406 - 4.406 48.74 44.334 0.360 0.391 39. 2022 - 4.406 - 4.406 48.74 44.334 0.360 0.391 30. 2023 - 4.406 - 4.406 48.74 44.334 0.360 0.093 31. 2024 - 4.406 - 4.406 48.74 44.334 0.360 0.093 31. 2024 - 4.406 - 4.406 48.74 44.334 0.360 0.120 33. 2025 - 4.406 - 4.406 48.74 44.334 0.008 0.009 34. 2027 - 4.406 - 4.406 48.74 44.334 0.008 0.009 36. 2029 - 4.406 - 4.406 48.74 44.334 0.008 0.009 37. 2030 - 4.406 - 4.406 48.74 44.334 0.008 0.009 38. 2031 - 4.406 - 4.406 48.74 44.334 0.008 0.009 39. 2032 - 4.406 - 4.406 48.74 44.334 0.008 0.00	1. 1994	4.450	**	-	4,450	M/D	-4.450	-3.771	-3.739
4. 1997 11.115 - - 11.115 - - 1.342 - 1.6673 - 2.917 - 2.7797 6. 1999 - 1.342 - 10.892 11.65 0.758 0.238 0.224 8. 2001 9.55 1.342 - 10.892 11.65 0.758 0.238 0.227 9. 2002 19.10 1.342 - 20.442 16.24 -4.202 -0.948 -0.878 10. 2003 19.10 1.342 - 20.442 18.07 -2.372 -0.453 -0.413 11. 2204 25.93 1.342 - 20.442 18.07 -2.372 -0.453 -0.473 12. 2005 18.44 1.342 - 19.782 18.33 -1.452 -0.199 -0.180 13. 2006 4.07 3.830 - 7.900 30.53 3.021 2.684 15. 2008 4.09 3.830 - 7.920 41.04 33.120<	2. 1995	11.115	_	-	11.115	-	-11.115	-7.983	-7.849
5. 1998 6.673 — 6.673 — 6.673 — 2.997 — 2.797 6. 1999 — 1.342 — 10.892 11.65 0.758 0.238 0.224 8. 2001 9.55 1.342 — 10.892 11.65 0.758 0.238 0.224 8. 2001 9.55 1.342 — 10.892 11.65 0.758 0.238 0.224 8. 2002 19.10 1.342 — 20.442 16.24 — 202 0.948 — 0.878 10. 2003 19.10 1.342 — 20.442 18.20 — 9.072 —1.469 —1.339 11. 2006 4.07 3.830 — 7.990 30.53 22.630 2.632 2.358 12. 2008 4.09 3.830 — 7.920 41.04 33.120 2.766 2.438 15. 2008 4.09 3.830 — 7.920 41.04 33.120 2		11.115			11.115	-	-11.115	-6.765	-6.596
6. 1999 - 1.342 - 1.342 5.96 4.618 1.711 1.626 7. 2000 9.55 1.342 - 10.892 11.65 0.758 0.238 0.224 8. 2001 9.55 1.342 - 10.892 14.00 3.108 0.827 0.773 9. 2002 19.10 1.342 - 20.442 16.24 -4.202 -0.948 -0.878 10. 2003 19.10 1.342 - 20.442 18.07 -2.372 -0.453 -0.417 11. 2204 25.93 1.342 - 27.272 18.20 -9.072 -1.469 -1.339 12. 2005 18.44 1.342 - 19.782 18.33 -1.452 -0.199 -0.180 13. 2006 4.07 3.830 - 7.900 30.53 22.630 2.632 2.358 14. 2007 6.105 3.830 - 9.935 40.57 30.635 3.021 2.684 15. 2008 4.09 3.830 - 7.920 41.04 33.120 2.766 2.438 16. 2009 - 4.406 - 4.406 46.79 42.384 3.000 2.619 17. 2010 - 4.406 - 4.406 47.29 42.884 2.573 2.230 18. 2011 - 4.406 - 4.406 47.29 42.884 2.573 2.230 18. 2011 - 4.406 - 4.406 48.16 43.654 1.881 1.602 20. 2013 - 4.406 - 4.406 48.16 43.754 1.597 1.348 19. 2012 - 4.406 - 4.406 48.16 43.754 1.597 1.348 12. 2014 - 4.406 - 4.406 48.83 43.974 1.152 0.959 23. 2016 - 4.406 - 4.406 48.63 44.224 0.831 0.681 25. 2018 - 4.406 - 4.406 48.63 44.224 0.831 0.681 25. 2019 - 4.406 - 4.406 48.74 44.334 0.510 0.689 26. 2019 - 4.406 - 4.406 48.74 44.334 0.590 0.807 26. 2019 - 4.406 - 4.406 48.74 44.334 0.510 0.699 28. 2021 - 4.406 - 4.406 48.74 44.334 0.510 0.691 29. 2022 - 4.406 - 4.406 48.74 44.334 0.510 0.403 28. 2021 - 4.406 - 4.406 48.74 44.334 0.510 0.403 28. 2021 - 4.406 - 4.406 48.74 44.334 0.510 0.403 28. 2021 - 4.406 - 4.406 48.74 44.334 0.510 0.403 28. 2021 - 4.406 - 4.406 48.74 44.334 0.510 0.403 29. 2022 - 4.406 - 4.406 48.74 44.334 0.510 0.403 29. 2023 - 4.406 - 4.406 48.74 44.334 0.510 0.403 29. 2023 - 4.406 - 4.406 48.74 44.334 0.510 0.099 204. 2033 - 4.406 - 4.406 48.74 44.334 0.510 0.099 21. 2020 - 4.406 - 4.406 48.74 44.334 0.010 0.039 22. 2025 - 4.406 - 4.406 48.74 44.334 0.010 0.039 23. 2025 - 4.406 - 4.406 48.74 44.334 0.010 0.039 24. 2027 - 4.406 - 4.406 48.74 44.334 0.010 0.009 25. 2028 - 4.406 - 4.406 48.74 44.334 0.010 0.009 26. 2029 - 4.406 - 4.406 48.74 44.334 0.010 0.009 27. 2020 - 4.406 - 4.406 48.74 44.334 0.010 0.009 28. 2021 - 4.406 - 4.406 48.74 44.334 0.018 0.009 29. 202		11.115	· -	-	11.115	_	-11.115	-5.733	-5.543
7. 2000 9.55 1.342 - 10.892 14.00 3.108 0.827 0.773 9. 2002 19.10 1.342 - 20.442 16.24 -4.202 -0.948 -0.878 10. 2003 19.10 1.342 - 20.442 18.07 -2.372 -0.453 -0.417 11. 2204 25.93 1.342 - 27.272 18.20 -9.072 -1.469 -1.339 12. 2005 18.44 1.342 - 19.782 18.33 -1.452 -0.199 -0.180 13. 2006 4.07 3.830 - 7.900 30.53 22.632 2.388 14. 2007 6.105 3.830 - 7.920 41.04 33.120 2.766 2.438 15. 2008 4.09 3.830 - 7.920 41.04 33.120 2.766 2.438 16. 2009 - 4.406 - 4.406 47.29 42.884 2.573 2.230 18. 2011<		6.673			6.673	_	6.673	-2.917	-2.797
8. 2001	6. 1999		1.342	G-	1.342	5.96	4.618	1.711	1.626
9. 2002 19.10 1.342 - 20.442 16.24 -4.202 -0.948 -0.878 10. 2003 19.10 1.342 - 20.442 18.07 -2.372 -0.453 -0.457 11. 2204 25.93 1.342 - 27.272 18.20 -9.072 -1.469 -1.339 12. 2005 18.44 1.342 - 19.782 18.33 -1.452 -0.199 -0.180 13. 2006 4.07 3.830 - 7.900 30.53 22.630 2.632 2.352 14. 2007 6.105 3.830 - 9.935 40.57 30.635 3.021 2.684 15. 2008 4.09 3.830 - 7.920 41.04 33.120 2.766 2.438 16. 2009 - 4.406 - 4.406 46.79 42.384 3.000 2.619 17. 2010 - 4.406 - 4.406 47.29 42.884 2.573 2.230 18. 2011 - 4.406 - 4.406 47.60 43.194 2.194 1.888 19. 2012 - 4.406 - 4.406 48.16 43.754 1.597 1.348 19. 2012 - 4.406 - 4.406 48.16 43.754 1.597 1.348 21. 2014 - 4.406 - 4.406 48.29 43.884 1.356 1.137 22. 2015 - 4.406 - 4.406 48.38 3.974 1.152 0.959 23. 2016 - 4.406 - 4.406 48.63 44.224 0.831 0.807 24. 2017 - 4.406 - 4.406 48.63 44.224 0.831 0.807 25. 2018 - 4.406 - 4.406 48.63 44.24 0.980 0.807 25. 2018 - 4.406 - 4.406 48.74 41.800 0.669 0.539 26. 2019 - 4.406 - 4.406 48.74 44.334 0.599 0.483 27. 2020 - 4.406 - 4.406 48.74 44.334 0.360 0.341 29. 2022 - 4.406 - 4.406 48.74 44.334 0.300 0.341 29. 2022 - 4.406 - 4.406 48.74 44.334 0.300 0.341 29. 2022 - 4.406 - 4.406 48.74 44.334 0.300 0.341 29. 2022 - 4.406 - 4.406 48.74 44.334 0.300 0.341 29. 2022 - 4.406 - 4.406 48.74 44.334 0.300 0.341 29. 2022 - 4.406 - 4.406 48.74 44.334 0.300 0.341 29. 2022 - 4.406 - 4.406 48.74 44.334 0.300 0.341 29. 2022 - 4.406 - 4.406 48.74 44.334 0.300 0.341 29. 2022 - 4.406 - 4.406 48.74 44.334 0.300 0.341 29. 2022 - 4.406 - 4.406 48.74 44.334 0.300 0.341 29. 2022 - 4.406 - 4.406 48.74 44.334 0.300 0.341 29. 2023 - 4.406 - 4.406 48.74 44.334 0.300 0.341 29. 2023 - 4.406 - 4.406 48.74 44.334 0.300 0.301 38. 2031 - 4.406 - 4.406 48.74 44.334 0.300 0.301 39. 2032 - 4.406 - 4.406 48.74 44.334 0.300 0.301 39. 2033 - 4.406 - 4.406 48.74 44.334 0.000 0.000 40. 2033 - 4.406 - 4.406 48.74 44.334 0.000 40. 2033 - 4.406 - 4.406 48.74 44.334 0.000 40. 2033 - 4.406 - 4.406 48.74 44.334 0.000 40. 2033 - 4.406 - 4.406 48.74 44.334 0.000 40. 2033 - 4.406 - 4.406 48.74 44.3	7. 2000	9.55	1.342	=6	10.892	11.65	0.758	0.238	0.224
10. 2003	8. 2001	9.55	1.342	***	10.892	14.00	3.108	0.827	0.773
11. 2204 25,93 1,342 - 27,272 18,20 -9,072 -1,469 -1,339 12. 2005 18,44 1,342 - 19,782 18,33 -1,452 -0,199 -0,180 13. 2006 4,07 3,830 - 7,900 30,53 22,630 2,632 2,358 14. 2007 6,105 3,830 - 9,935 40,57 30,635 3,021 2,684 15. 2008 4,09 3,830 - 7,920 41,04 33,120 2,766 2,438 16. 2009 - 4,406 - 4,406 47,29 42,884 2,573 2,230 18. 2011 - 4,406 - 4,406 47,60 43,194 2,194 1,888 19. 2012 - 4,406 - 4,406 43,164 43,754 1,597 1,348 21. 2014 - 4,406 - 4,406 43,164 43,174 1,152 0,959 23. <td< td=""><td></td><td></td><td>1.342</td><td></td><td>20,442</td><td>16.24</td><td>-4.202</td><td>-0.948</td><td>-0.878</td></td<>			1.342		20,442	16.24	-4.202	-0.948	-0.878
12. 2005	10. 2003	19.10	1.342		20.442	18.07	-2.372	-0.453	-0.417
13. 2006 4.07 3.830 - 7.900 30.53 22.630 2.632 2.358 14. 2007 6.105 3.830 - 9.935 40.57 30.635 3.021 2.684 15. 2008 4.09 3.830 - 7.920 41.04 33.120 2.766 2.438 16. 2009 - 4.406 - 4.406 46.79 42.384 3.000 2.619 17. 2010 - 4.406 - 4.406 47.60 43.194 2.194 1.881 19. 2012 - 4.406 - 4.406 48.06 43.654 1.881 1.602 20. 2013 - 4.406 - 4.406 43.054 1.597 1.348 21. 2014 - 4.406 - 4.406 43.644 43.754 1.597 1.348 22. 2015 - 4.406 - 4.406 48.16 43.754 1.597 1.348 25. 2018 - 4.406 - 4.406 48.53 44.124 0.80 0.807 <			1.342	. 60	27.272	18.20	-9.072	-1.469	-1.339
14. 2007 6.105 3.830 - 9.935 40.57 30.635 3.021 2.684 15. 2008 4.09 3.830 - 7.920 41.04 33.120 2.766 2.438 16. 2009 - 4.406 - 4.406 47.29 42.884 2.573 2.230 18. 2011 - 4.406 - 4.406 47.60 43.194 2.194 1.888 19. 2012 - 4.406 - 4.406 48.06 43.654 1.881 1.602 20. 2013 - 4.406 - 4.406 48.06 43.654 1.881 1.602 20. 2015 - 4.406 - 4.406 48.29 43.884 1.356 1.137 22. 2015 - 4.406 - 4.406 48.38 43.974 1.152 0.959 23. 2016 - 4.406 - 4.406 48.63 44.124 0.881 0.681 25. 2018 - 4.406 - 4.406 48.74 44.334 0.50 0.689 <td></td> <td>18.44</td> <td>1.342</td> <td>-</td> <td>19.782</td> <td>18.33</td> <td>-1.452</td> <td>-0.199</td> <td>-0.180</td>		18.44	1.342	-	19.782	18.33	-1.452	-0.199	-0.180
15. 2008	13. 2006	4.07	3.830		7.900	30.53	22.630	2.632	2.358
16. 2009 - 4.406 - 4.406 46.79 42.384 3.000 2.619 17. 2010 - 4.406 - 4.406 47.29 42.884 2.573 2.230 18. 2011 - 4.406 - 4.406 47.60 43.194 2.194 1.888 19. 2012 - 4.406 - 4.406 48.06 43.654 1.881 1.602 20. 2013 - 4.406 - 4.406 48.16 43.754 1.597 1.348 21. 2014 - 4.406 - 4.406 48.29 43.884 1.356 1.137 22. 2015 - 4.406 - 4.406 48.34 43.974 1.152 0.959 23. 2016 - 4.406 - 4.406 48.53 44.124 0.881 0.661 25. 2018 - 4.406 2.534 6.940 48.74 44.334 0.599 0.483 27. 2020 - 4.406 - 4.406 48.74 44.334 0.510 0.949			3.830	-		40.57		3.021	2.684
17. 2010	15. 2008	4.09	3.830	• -	7.920	41.04	33.120	2.766	2.438
18. 2011 - 4,406 - 4,406 47.60 43.194 2.194 1.888 19. 2012 - 4,406 - 4,406 48.06 43.654 1.881 1.502 20. 2013 - 4,406 - 4,406 48.16 43.754 1.597 1.348 21. 2014 - 4,406 - 4,406 48.29 43.884 1.356 1.137 22. 2015 - 4,406 - 4,406 48.63 43.974 1.152 0.959 23. 2016 - 4,406 - 4,406 48.63 44.124 0.831 0.681 24. 2017 - 4,406 - 4,406 48.74 41.800 0.669 0.539 26. 2019 - 4,406 - 4,406 48.74 44.334 0.599 0.483 27. 2020 - 4,406 - 4,406 48.74 44.334 0.510 0.403 28. 2021 - 4,406 - 4,406 48.74 44.334 0.430 0.341		- ·	4.406	-	4.406	46.79	42.384	3.000	2.619
19. 2012	17. 2010	-			4.406	47.29	42.884	2.573	2.230
20. 2013 - 4.406 - 4.406 48.16 43.754 1.597 1.348 21. 2014 - 4.406 - 4.406 48.29 43.884 1.356 1.137 22. 2015 - 4.406 - 4.406 48.38 43.974 1.152 0.959 23. 2016 - 4.406 - 4.406 48.53 44.124 0.980 0.807 24. 2017 - 4.406 - 4.406 48.63 44.224 0.831 0.681 25. 2018 - 4.406 - 4.406 48.74 41.800 0.669 0.539 26. 2019 - 4.406 - 4.406 48.74 44.334 0.510 0.403 28. 2021 - 4.406 - 4.406 48.74 44.334 0.510 0.403 28. 2021 - 4.406 - 4.406 48.74 44.334 0.310 0.239 31. 2024 - 4.406 - 4.406 48.74 44.334 0.160 0.24 <	18. 2011	_	4.406	_	4.406	47.60	43.194	2.194	1.888
21. 2014 - 4.406 - 4.406 48.29 43.884 1.356 1.137 22. 2015 - 4.406 - 4.406 48.38 43.974 1.152 0.959 23. 2016 - 4.406 - 4.406 48.53 44.124 0.980 0.807 24. 2017 - 4.406 - 4.406 48.63 44.224 0.831 0.661 25. 2018 - 4.406 - 4.406 48.74 41.800 0.669 0.539 26. 2019 - 4.406 - 4.406 48.74 44.334 0.599 0.483 27. 2020 - 4.406 - 4.406 48.74 44.334 0.510 0.941 29. 2022 - 4.406 - 4.406 48.74 44.334 0.364 0.284 30. 2023 - 4.406 - 4.406 48.74 44.334 0.310 0.239 31. 2024 - 4.406 - 4.406 48.74 44.334 0.310 0.229		-	4.406	٠ 🟎	4.406	48.06	43.654	1.881	1.602
22. 2015 - 4.406 - 4.406 48.38 43.974 1.152 0.959 23. 2016 - 4.406 - 4.406 48.53 44.124 0.980 0.807 24. 2017 - 4.406 - 4.406 48.63 44.224 0.831 0.681 25. 2018 - 4.406 - 4.406 48.74 41.800 0.669 0.539 26. 2019 - 4.406 - 4.406 48.74 44.334 0.599 0.483 27. 2020 - 4.406 - 4.406 48.74 44.334 0.510 0.403 28. 2021 - 4.406 - 4.406 48.74 44.334 0.364 0.284 30. 2023 - 4.406 - 4.406 48.74 44.334 0.310 0.239 31. 2024 - 4.406 - 4.406 48.74 44.334 0.310 0.239 32. 2025 - 4.406 8.038 12.444 48.74 44.334 0.186 0.142	20. 2013	· · · · ·	4.406	•••	4.406	48.16	43.754	1.597	1.348
23. 2016 - 4.406 - 4.406 - 4.406 48.53 44.124 0.980 0.807 24. 2017 - 4.406 - 4.406 - 4.406 48.63 44.224 0.831 0.681 25. 2018 - 4.406 - 4.406 48.74 41.800 0.669 0.539 26. 2019 - 4.406 - 4.406 48.74 44.334 0.599 0.483 27. 2020 - 4.406 - 4.406 48.74 44.334 0.510 0.403 28. 2021 - 4.406 - 4.406 48.74 44.334 0.364 0.284 30. 2023 - 4.406 - 4.406 48.74 44.334 0.364 0.284 31. 2024 - 4.406 - 4.406 48.74 44.334 0.310 0.239 31. 2026 - 4.406 8.038 12.444 48.74 36.296 0.181 0.138 33. 2026 - 4.406 - 4.406 48.74 44.334 0.160 0.120 35. 2028 - 4.406 - 4.406 48.74 44.334 0.160 0.120 35. 2028 - 4.406 <td></td> <td>. —</td> <td>4.406</td> <td>: •••</td> <td></td> <td>48.29</td> <td>43.884</td> <td>1.356</td> <td>1.137</td>		. —	4.406	: •••		48.29	43.884	1.356	1.137
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Total +1.014 ~2.480	and the second second	- 145 s. -				48.74	44.334		The second secon
	Total							+1.014	-2.480

EIRR = $0.18 + 0.01 \times \frac{1.014}{1.014 + 2.480} = 18.29\%$

Table 8-45 Economic Analysis --- Economic Price Base
(Case 5) (unit: M\$ million)

Project	Project	0 & M	Repl.	Total	Incre.		Present	Worth Value
Year	Cost	Cost	Cost	Cost	NPV	Benefit	18%	19%
	The formation of the state of t	**************************************	Berton Committee	the same of the sa	2			
1. 1994	3.835		l-e	3.835		-3.835	-3.223	-3.196
2. 1995	9.580	90-	_	9.580	***	9.580	-6.765	-6.652
3. 1996	9.580	**	B cco	9.580		-9.580	-5.685	-5.544
4. 1997	9.580	, palay	***	9.580	-	-9.580	-4.778	-4.620
5. 1998	5.756		_	5.756		5.756	-2.412	-2.313
6. 1999	: -	1.074		1.074	6.65	5.576	1.963	1.867
7. 2000	8.240	1.074	**	9.314	11.53	2.216	0.656	0.618
8. 2001		1.074	-	9.314	13.42	4.106	1.021	0.955
9. 2002		1.074		17.554	15.43	-2.124	-0.444	-0.412
10. 2003	16.480	1.074	€	17.554	16.89	-0.664	-0.117	-0.107
11. 2204	22.350	1.074		23,424	17.00	-6.424	~0.948	-0.865
12. 2005	15.856	1.074	-	16.93	17.00	-0.007	-0.001	-0.001
13. 2006	3.510	3.064	-:	6.574	28.10	21.526	2.243	2.013
14, 2007	5.265	3,064		8.329	38.00	29.675	2.600	2.311
15. 2008	3.515	3.064	, m 1.	6.579	38.36	31.781	2.339	2.063
16. 2009	_	3.525	· · · · · · · · · · · · · · · · · · ·	3.525	43.85	40.325	2.492	2.182
17. 2010	ten.	3,535	~	3.525	44.26	40.735	2.118	1.837
18. 2011		3.535	-	3.525	44.58	41.055	1.794	1.544
19. 2012	· · ·	3.535		3.525	44.04	41.515	1.524	1.299
20. 2013		3.535	: 4	3.525	45.11	41.585	1.281	1.085
21. 2014		3.535		3.525	45.24	41.815	1.080	1.905
22. 2015	****	3.535		3.525	45.31	41.785	0.911	0.756
23. 2016	10-	3.535	_	3.525	45.43	41.905	0.767	0.633
24. 2017	-	3.535		3.525	45.52	41.995	0.647	0.529
25. 2018		3.525	2.476	6.001	45.61	39.609	0.511	0.416
26. 2019		3.525	~·~·~	3.525	45.61	42.085	0.459	0.366
27. 2020		3.525		3.525	45.61	42.085	0.383	0.307
28. 2021	-	3.525	_	3.525	45.61	42.085	0.324	0.257
29. 2022	· -	3.525	-	3.525		42.085	0.269	0.215
		3.525		3.525	45.61	42.085	0.227	0.177
30. 2023	-		-				0.227	0.147
31. 2024	•	3.525	7 051	3.525	45.61	42.085	and the second second	•
32. 2025		3.525	7.853	11.378	45.61	34.232	0.130	
33. 2026	. **	3.525		3.525	45.61	42.085	0.135	0.101
34. 2027	_	3.525	4 005	3.525	45.61	42.085	0.114	0.084
35. 2028		3.525	1.335	4.860	45.61	40.750	0.094	0.069
36. 2029	•	3.525		3.525	45.61	42.086	0.080	0.059
37. 2030		3.525	-	3.525	45.61	42.085	0.067	0.051
38. 2031		3.525	-	3.525	45.61	42.085	0.055	0.042
39. 2032	-	3.525	-	3,525	45.61	42.085	0.046	0.034
40. 2033		3.525	-	3.525	45.61	42.085	0.042	0.029
41. 2034		3.525	***	3.525	45.61	42.085	0.034	0.025
42, 2035		3.525	. •	3.525	45.61	42.085	0.029	0.021
43. 2036		3.525	· -	3.525	45.61	42.085	0.025	0.017
44. 2037		3.525	•	3.525	45.61	42.085	0.021	0.013
45. 2038	_	3.525	2.476	6.001	45.61	39.609	0.016	0.019
46. 2039	· -	3.525	. 🕶	3.525	45.61	42.095	0.013	0.008
47. 2040		3.525		3.525	45.61	42.095	0.013	0.008
48. 2041		3.525	-	3.525	45.61	42.095	0.008	0.004
49. 2042	uhus	3.525	_ .	3.525	45.61	42.095	0.008	0.004
50. 2043	٠, 🛥	3.525		3.525	45.61	42.095	0.008	0.004
Total			*		5 7. 4	# 137 គី ដ	+2.359	-0.239
-								

EIRR = $0.19 + 0.01 \times \frac{2.359}{2.359 + 0.239} = 19.91$ %

Table 13-1 UNIT RATE BUILD-UP

(1).Drilling equi			1 1 1 1 1 1 1 1 1 1			
Drilling (1)-1	DESCRIFION	7 T NIO	*CANALLI.	(Ringgit)	(Ringgit)	KEMAKAS
_	equipment					
	Crawler drill	hr	45,444.00	72.15	3,278,784.60	
	Compressor	hr	45,444.00	21.87	993,860,28	
(1)-3 Alle	Allowance	(1)-1	1*3%		98,363.54	-
	Subtotal (1)				4,371,008.42	
(2). Heavy equipment						
-	Tractor shovel 988B	hr	4,085.00	137.31	-	
	truck	hr	70,466.00	108.02	7,611,737.32	
(2)-3 Bull	Bulldozer D8	hr	18,836.00	86.67		
	Subtotal (2)				9,805,164.79	
(3).Blasting mate	materials					
	Dynami te	kg	286,000.00	14.08	4,026,880.00	
┝	FO	kg	1,146,000.00	0.96	1,100,160.00	
(3)-3 Detc	Detonator (electric)	No	520.	۱۰	194,684.	
┢	Subtotal					
(4) Fuel Lubricant	nt & Electricity	-				
7)		liter	3.375.915.60	0.40	1,350,366,24	
卜	Lubricant	1	1*20%		270,073.25	
-	Subtotal (4)	_				
	1					•
(5) Labour						
(5)-1	Foreman	h	3,351.00	10.04	33,644.04	
┢	LU	hr	13,404.00	4.81		
(5)-3 Crav	Crawler drill Operator	hr	45,444.00	5.23	672.1	
<u> </u>	Ditto Assistant	hr	22,722.00	3.03	847.	
╀╌	nioment)	hr	25,239.00	4.81	121,399.59	
╂╾	Ditto	hr	4.085.00	3.44	14,052.40	
(5)-7 Genera	labour	hr	25,239.00	2.48	62,592,72	
 					602,681.77	
	}					
(6).Subtotal	(1) to (5)				21,721,018.47	
(7). Rock production	ion total (6)/4,700,000				4.62	
		•				