

FEASIBILITY REPORT
ON
BANKING BANK PHASE PROJECT
FOR
INTERNATIONAL BANKING SWAP AREA
A DEVELOPMENT AND INVESTMENT
ANALYSIS

1975

1975

INTERNATIONAL BANKING SWAP AREA

1975

**FEASIBILITY REPORT
ON
BUKIT BAUK PILOT PROJECT
FOR
TRENGGANU TENGAH SWAMP AREA
AGRICULTURAL DEVELOPMENT
MALAYSIA**

JICA LIBRARY



1060059E13

APPENDIX

MARCH 1979

JAPAN INTERNATIONAL COOPERATION AGENCY

国際協力事業団	
受入 月日 84. 9. 19	113
登録No. 09744	81
	AFT

CONTENTS

	<u>Page</u>
APPENDIX I HYDROLOGICAL DATA	I-1
APPENDIX II SOIL	II-1

APPENDIX I HYDROLDGICAL DATA



APPENDIX. I HYDROLOGICAL DATA

	<u>Page</u>
1. Rainfall	I-1
1.1 Klinik Bidan Paka (Station No. 4634085)	I-1
° Monthly Rainfall 1957 - 1978	I-1
° Daily Rainfall 1957 - 1978	I-3
° Monthly Available Rainfall 1957 - 1977	I-24
° Daily Available Rainfall 1957 - 1977	I-26
2. Water Level	I-47
2.1 Durian Mentangau	I-47
2.2 Kg. Luit (Station No. 4732461)	I-53
3. Evaporation	I-56

1.1 Klinik Bidan Paka (Station No. 4634085)

MONTHLY RAINFALL (mm)

Station No. 4634085

Month Year	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL	REMARKS
1957	-	158	159	-	-	223	122	170	193	250	582	671	(2528)	Station No. 34
1958	331	40	14	-	59	70	149	13	177	182	556	215	(1806)	"
1959	162	26	175	185	222	62	199	136	65	397	819	214	2662	Station No. 9085
1960	280	80	102	128	201	103	68	143	230	223	402	629	2589	"
1961	198	94	166	274	96	145	89	194	81	193	863	1008	3401	"
1962	247	4	235	105	131	91	182	177	189	317	226	506	2410	"
1963	326	23	25	4	27	51	133	182	80	56	370	386	1663	"
1964	99	313	41	91	188	179	62	47	186	267	376	327	2176	"
1965	25	80	91	205	53	193	123	61	106	155	450	900	2442	"
1966	430	322	196	80	269	178	170	186	139	243	109	1245	3567	"
1967	937	259	58	127	141	77	172	234	69	182	577	351	3184	"
1968	81	19	43	222	297	71	120	204	218	573	386	739	2973	"
1969	389	214	96	45	46	102	73	74	102	122	888	860	3011	"
1970	50	41	119	186	61	198	92	190	162	323	669	795	2886	Station No. 4634085
1971	368	127	727	13	225	122	69	173	107	231	493	595	3252	"
1972	-	49	76	119	42	79	180	132	344	130	-	-	(1152)	"
1973	232	36	525	109	55	84	91	197	155	434	445	1216	3579	"
1974	52	141	125	183	64	231	63	457	169	218	554	1051	3308	"
1975	1095	212	136	192	219	315	92	60	183	249	562	554	3870	"
1976	9	0	39	83	186	196	168	190	259	194	1092	295	2711	"

MONTHLY AVAILABLE RAINFALL (mm)

Station No. 4634085

Month Year	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL	REMARKS
1957	-	125	120	-	-	175	95	137	154	198	328	-	(1332)	
1958	239	32	8	-	43	54	87	10	139	142	336	166	(1256)	
1959	121	15	136	144	173	34	158	105	51	273	455	157	1822	
1960	193	53	74	100	161	82	45	111	171	172	285	420	1867	
1961	159	66	133	197	74	116	60	150	60	150	557	667	2389	
1962	189	-	188	64	101	69	139	140	151	254	169	386	(1850)	
1963	184	17	12	-	11	38	102	140	65	38	289	279	(1175)	
1964	68	241	31	67	148	122	42	37	146	197	292	255	1646	
1965	17	62	73	162	40	155	93	32	85	123	353	706	1901	
1966	342	232	158	62	215	129	133	148	107	180	76	572	2354	
1967	407	193	38	90	112	54	127	176	42	131	443	262	2075	
1968	48	12	21	164	221	31	84	158	163	373	256	512	2043	
1969	281	162	66	27	31	74	50	47	72	92	571	522	1995	
1970	26	28	89	138	15	148	61	148	106	234	482	416	1891	
1971	225	97	371	8	169	76	46	131	80	171	239	430	2043	
1972	-	39	61	92	27	62	131	97	269	92	-	-	(870)	
1973	182	15	311	80	31	61	67	153	109	327	295	688	2319	
1974	36	99	91	142	51	155	47	358	136	159	342	681	2297	
1975	717	158	106	151	176	253	61	48	137	197	441	328	2773	
1976	4	-	29	66	141	156	131	146	198	146	418	219	(1654)	

2. Water Level
 2.1 Kg. Durian Mentangau

HOURLY WATER LEVEL

Station: Durian Mentangau
 (Unit: feet)

Year	1973							
Month	12							
Date	1	2	3	4	9	10	11	12
Hour								
1		9.0	11.0	11.2		11.2	16.7	17.7
2		9.1	11.0			11.3	16.8	17.7
3		9.2	11.0			11.4	16.8	17.7
4		9.3	11.0			11.5	17.0	17.7
5		9.5	11.2			11.6	17.0	17.7
6		9.7	11.2		8.7	12.0	17.0	17.7
7		9.9	11.2		8.9	13.0	17.1	17.7
8		10.0	11.2		9.0	13.4	17.1	17.8
9		10.0	11.2		9.0	14.0	17.2	17.8
10		10.1	11.2		9.1	14.3	17.3	17.8
11		10.2	11.2		9.2	14.8	17.3	17.8
12	8.2	10.3	11.2		9.3	15.0	17.3	17.8
13	8.2	10.4	11.2		9.5	15.3	17.4	17.8
14	8.2	10.4	11.2		9.7	15.5	17.5	17.8
15	8.2	10.5	11.2		9.9	15.8	17.6	17.8
16	8.3	10.6	11.2		10.0	15.9	17.7	17.9
17	8.4	10.7	11.2		10.0	16.0	17.6	17.9
18	8.4	10.8	11.2		10.1	16.0	17.6	17.9
19	8.5	10.8	11.2		10.1	16.2	17.6	17.9
20	8.6	10.8	11.2		10.2	16.3	17.6	17.9
21	8.7	10.9	11.2		10.3	16.5	17.6	17.9
22	8.8	10.9	11.2			16.5	17.7	17.9
23	9.0	10.9	11.2			16.5	17.7	15.5
24	9.0	11.0	11.2			16.6	17.7	15.5
Mean	8.5	9.8	11.2	11.2	9.6	13.9	17.3	16.9
Max.	9.0	11.0	11.2	11.2	10.3	16.6	17.7	17.9

HOURLY WATER LEVEL

Station: Durian Mentangau
(Unit: feet)

Year	1973		1974					
Month	12		11					
Date	13	22	24	25	26	27	29	30
Hour								
1	15.5			8.8	10.4	10.1		9.9
2	15.5			8.9	10.4	10.1		10.0
3	15.6			9.0	10.4	10.0		10.0
4	15.7			9.0	10.4	10.0		10.1
5	15.7			9.1	10.4	10.0		10.2
6	15.8			9.2	10.5	10.0		10.3
7	15.9	10.7		9.4	10.5	9.9		10.4
8	16.0	10.4		9.5	10.5	9.7	8.2	10.5
9	15.9	10.2		9.6	10.4	9.6	8.2	10.5
10		10.2		9.7	10.4	9.4	8.3	10.5
11		10.2		9.8	10.4	9.5	8.5	10.6
12		10.4		9.8	10.3	9.3	8.5	10.6
13		10.8		9.9	10.3		8.7	10.7
14		10.8		9.9	10.3		8.8	10.8
15		10.9	8.0	10.0	10.3		8.9	10.9
16		10.9	8.0	10.0	10.3		9.0	11.0
17		11.0	8.0	10.0	10.3		9.0	11.0
18		11.0	8.0	10.0	10.3		9.1	11.0
19		11.1	8.1	10.1	10.3		9.1	11.2
20		11.3	8.2	10.1	10.3		9.2	11.2
21		11.3	8.3	10.2	10.2		9.3	11.3
22		11.3	8.4	10.3	10.2		9.5	11.3
23		11.3	8.4	10.3	10.2		9.7	11.4
24			8.5	10.3	10.2		9.8	11.4
Mean	15.7	10.8	8.2	9.7	10.3	9.8	8.9	10.7
Max.	16.0	11.3	8.5	10.3	10.5	10.1	9.8	11.4

HOURLY WATER LEVEL

Station: Durian Mentangau
(Unit: feet)

Year	1974	1975						
Month	12	1						
Date	31	1	2	3	4	5	6	7
Hour								
1	11.2	11.5	11.5	12.2	12.2	12.0	13.4	14.1
2	11.4	11.5	11.5	12.2	12.3	12.1	13.5	14.1
3	11.5	11.5	11.5	12.2	12.4	12.1	13.5	14.0
4	11.5	11.5	11.5	12.2	12.3	12.2	13.8	14.0
5	11.5	11.5	11.5	12.2	12.3	12.3	13.9	14.0
6	11.5	11.5	11.5	12.2	12.2	12.4	14.0	14.0
7	11.5	11.5	11.5	12.3	12.1	12.6	14.0	14.0
8	11.5	11.5	11.5	12.3	12.0	12.6	14.0	14.0
9	11.5	11.5	11.5	12.3	12.0	12.8	14.0	14.0
10	11.5	11.5	11.5	12.4	12.0	13.0	14.1	14.0
11	11.5	11.5	11.8	12.4	12.0	13.0	14.1	14.0
12	11.5	11.5	12.0	12.4	12.0	13.2	14.1	14.0
13	11.5	11.5	12.0	12.4	12.0	13.3	14.1	14.0
14	11.5	11.5	12.0	12.4	12.0	13.4	14.1	14.0
15	11.5	11.5	12.0	12.4	12.0	13.4	14.1	14.0
16	11.5	11.5	12.1	12.4	12.0	13.4	14.1	14.1
17	11.5	11.5	12.1	12.3	12.0	13.4	14.1	14.1
18	11.5	11.5	12.1	12.3	12.0	13.4	14.1	14.1
19	11.5	11.5	12.1	12.3	12.0	13.4	14.1	14.1
20	11.5	11.5	12.1	12.3	12.0	13.5	14.1	14.1
21	11.5	11.5	12.1	12.2	12.0	13.6	14.1	14.1
22	11.5	11.5	12.1	12.1	12.0	13.9	14.2	14.0
23	11.5	11.5	12.1	12.1	12.0	14.0	14.2	14.0
24	11.5	11.5	12.1	12.1	12.0	13.4	14.2	14.0
Mean	11.5	11.5	11.8	11.8	12.1	12.7	13.8	14.0
Max.	11.5	11.5	12.1	12.4	12.4	14.0	14.2	14.1

HOURLY WATER LEVEL

Station: Durian Mentangau
(Unit: feet)

Year	1975							
Month	1	11						
Date	8	24	25	26	27	28	29	30
Hour								
1	14.0		9.0	10.3	12.5	15.0	15.5	15.1
2	14.0		9.0	10.4	12.7	15.0	15.5	15.0
3	14.0		9.1	10.5	12.8	15.1	15.5	15.0
4	14.0		9.1	10.8	12.9	15.2	15.5	15.0
5	14.0		9.1	10.9	13.0	15.3	15.5	15.0
6	13.8		9.2	11.0	13.2	15.3	15.5	15.0
7	13.7		9.2	11.0	13.2	15.3	15.2	15.0
8	13.6		9.2	11.0	13.4	15.3	15.3	15.0
9	13.5	8.0	9.2	11.1	13.7	15.4	15.3	15.0
10	13.4	8.1	9.3	11.2	13.8	15.4	15.3	15.0
11	13.3	8.2	9.4	11.2	13.9	15.4	15.3	15.0
12	13.2	8.3	9.5	11.2	14.0	15.4	15.2	15.0
13	13.2	8.4	9.5	11.3	14.0	15.4	15.2	14.9
14	13.2	8.5	9.6	11.5	14.0	15.4	15.2	14.8
15	13.2	8.6	9.7	11.5	14.0	15.4	15.2	14.8
16	13.2	8.7	9.8	11.6	14.0	15.4	15.2	14.8
17	13.2	8.8	9.9	11.8	14.2	15.4	15.2	14.7
18	13.3	8.9	9.9	11.9	14.4	15.6	15.2	14.6
19	13.4	9.0	10.0	11.9	14.7	15.6	15.2	14.4
20	13.5	9.0	10.0	11.9	14.8	15.5	15.2	14.3
21	13.4	9.0	10.0	12.0	14.8	15.5	15.2	14.2
22	13.4	9.0	10.0	12.0	14.9	15.5	15.2	14.2
23	13.4	9.0	10.1	12.2	15.0	15.5	15.1	14.2
24	13.4	9.0	10.2	12.4	15.0	15.5	15.1	14.1
Mean	13.5	8.7	9.5	11.0	13.9	15.4	15.3	14.8
Max.	14.0	9.0	10.2	12.4	15.0	15.6	15.5	15.1

HOURLY WATER LEVEL

Station: Durian Mentangau
(Unit: feet)

Year	1975		1976					
Month	12		11				12	
Date Hour	1	2	24	28	29	30	1	2
1	14.1	11.5	8.4	8.2	10.9	15.5	15.1	14.0
2	14.0	11.2	8.4	8.1	11.0	15.5	15.1	14.0
3	14.0		8.5	8.1	11.0	15.5	15.0	14.0
4	14.0		8.5	8.1	11.0	15.5	15.0	13.9
5	14.0		8.7	8.2	11.1	15.5	15.0	13.8
6	14.0		8.8	8.2	11.2	15.5	14.9	13.7
7	14.0		8.8	8.3	11.5	15.5	14.9	13.6
8	14.0		8.9	8.7	11.8	15.5	14.8	13.6
9	13.9		9.0	9.0	12.1	15.5	14.7	13.5
10	13.7		9.0	9.3	12.3	15.5	14.6	13.5
11	13.6		9.0	9.8	12.5	15.5	14.6	13.4
12	13.5		9.0	10.1	12.7	15.5	14.5	13.3
13	13.2		9.0	10.4	12.9	15.5	14.4	13.2
14	13.0		8.9	10.4	13.2	15.5	14.4	13.2
15	12.9		8.8	10.4	13.3	15.5	14.3	13.2
16	12.8		8.7	10.4	13.4	15.5	14.2	13.1
17	12.7		8.6	10.5	13.8	15.5	14.2	13.2
18	12.5		8.6	10.6	14.0	15.5	14.2	13.2
19	12.3		8.6	10.8	14.2	15.4	14.1	13.1
20	12.2		8.5	10.7	14.5	15.4	14.1	13.0
21	12.1		8.4	10.7	14.8	15.4	14.2	13.0
22	12.0		8.3	10.7	15.0	15.4	14.2	13.0
23	11.9		8.2	10.8	15.2	15.3	14.1	12.9
24	11.8		8.2	10.9	15.5	15.2	14.1	12.8
Mean	13.2	11.4	8.7	9.6	13.1	15.5	14.5	13.4
Max.	14.1	11.5	9.0	10.9	15.5	15.5	15.1	14.0

HOURLY WATER LEVEL

Station: Durian Mentangau
(Unit: feet)

Year	1976	
Month	12	
Date	3	4
Hour		
1	12.7	11.2
2	12.6	11.2
3	12.6	11.0
4	12.6	11.0
5	12.5	11.0
6	12.3	10.9
7	12.4	10.8
8	12.4	10.7
9	12.3	10.3
10	12.3	10.0
11	12.2	10.1
12	12.1	10.0
13	12.0	10.1
14	12.0	10.0
15	12.0	9.9
16	11.9	9.7
17	11.7	9.6
18	11.6	9.5
19	11.5	9.4
20	11.5	9.4
21	11.5	9.4
22	11.5	9.4
23	11.4	
24	11.2	
Mean	12.0	10.2
Max.	12.7	11.2

3. EVAPORATION

	SITE NAME NO.	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	TOTAL
OPEN WATER EVAPORATION	DUNGUN 0476	126	119	158	147	150	141	142	147	144	146	121	117	1658
	DUNGUN 4734379	150	152	182	172	161	138	144	154	143	140	116	128	1778
	MEAN	138	135.5	170	159.5	155.5	139.5	143	150.4	143.5	143	118.5	122.5	1718
		4.5	4.8	5.5	5.3	5.0	4.7	4.6	4.9	4.8	4.6	4.0	4.0	4.7
FOREST EVAPORATION	DUNGUN 0476	110	103	138	127	131	123	124	128	125	127	105	102	1443
	DUNGUN 4734374	134	135	162	153	143	122	128	137	127	125	103	112	1581
	MEAN	122	119	150	140	137	122.5	126	132.5	126	126	104	107	1521
		3.9	4.3	4.8	4.7	4.4	4.1	4.1	4.3	4.2	4.1	3.5	3.5	4.2
GRASS EVAPORATION	DUNGUN 0476	99	94	125	116	118	111	112	116	114	115	96	93	1309
	DUNGUN 4734374	125	127	152	143	135	115	121	128	119	117	97	105	1484
	MEAN	112	110.5	138.5	129.5	126.5	113	116.5	122	116.5	116	96.5	99	1396.5
		3.6	3.9	4.5	4.3	4.1	3.8	3.8	3.9	3.9	3.7	3.2	3.2	3.8

Source: Evaporation in Peninsular Malaysia (1976)
Water Resources Publication No. 5