

T A B L E



Table VII-1 GROSS DOMESTIC PRODUCT.

	1970-80		1970-80		1980-85		1985-90		1990-GDP					
	M	S	M	S	M	S	M	S	M	S				
Agriculture, forestry and fishery	3,852 (30.5)	460 (54.2)	4.2	6.5	5,809 (22.9)	861 (44.3)	3.0	2.2	6,720 (18.3)	962 (34.8)	4.0	4.6	8,193 (14.9)	1,203 (29.3)
Mining and Quarrying	834 (6.6)	3 (0.3)	3.8	56.5	1,214 (4.8)	264 (13.6)	5.8	8.6	1,607 (4.4)	400 (14.5)	3.0	5.3	1,863 (3.4)	517 (12.6)
Manufacturing	1,858 (14.7)	21 (2.5)	11.2	7.9	5,374 (21.2)	45 (2.3)	11.0	16.6	9,040 (24.6)	97 (3.5)	10.8	13.4	15,121 (27.6)	182 (4.4)
Construction	541 (4.3)	36 (4.2)	8.2	11.1	1,186 (4.7)	103 (5.3)	9.0	11.9	1,824 (5.0)	181 (6.5)	10.0	12.0	2,938 (5.4)	320 (7.8)
Electricity, Gas and Water	238 (1.9)	10 (1.2)	9.5	9.1	592 (2.3)	24 (1.2)	10.0	10.2	933 (2.6)	39 (1.4)	9.5	10.4	1,500 (2.7)	64 (1.6)
Transport, Storage and Communications	632 (5.0)	44 (9.3)	10.4	9.3	1,696 (6.7)	107 (5.5)	8.0	9.7	2,492 (6.8)	170 (6.1)	9.0	10.7	3,834 (7.0)	283 (6.9)
Wholesale, Hotels and Restaurants	1,717 (13.6)	105 (12.4)	6.7	6.1	3,295 (13.0)	189 (9.7)	8.0	12.2	4,841 (13.2)	336 (12.1)	8.5	11.0	7,279 (13.3)	568 (13.8)
Insurance and Ownership of Dwellings	1,126 (8.9)	66 (7.8)	6.7	7.3	2,155 (8.5)	134 (6.9)	7.4	8.9	3,079 (8.4)	205 (7.4)	8.5	10.1	4,629 (8.4)	332 (8.1)
Public Administration and Defence	1,466 (11.6)	89 (10.5)	8.8	7.7	3,398 (13.4)	187 (9.6)	9.0	11.8	5,228 (14.2)	327 (11.8)	9.0	11.0	8,044 (14.7)	553 (13.5)
Other Services	354 (2.9)	14 (1.7)	6.4	7.9	657 (2.5)	30 (1.6)	7.6	10.6	948 (2.6)	50 (1.8)	9.0	11.2	1,459 (2.7)	85 (2.1)
TOTAL GDP	12,618 (100.0)	848 (100.0)	7.2	8.7	25,376 (100.0)	1,944 (100.0)	7.7	7.3	36,732 (100.0)	2,767 (100.0)	8.4	8.2	54,860 (100.0)	4,107 (100.0)
(GDP per capita)	1,172.2	1,302.9			1,836	1,847			2,337.8	2,216.9			3,128.5	2,807.6

Source: Fourth Malaysia Plan, 1981-85

Note: M: Malaysia, S: Sabah and () : %

Table VII-2 SUMMARY OF STATE GOVERNMENT REVENUE (ACTUAL)

Unit: M\$1000

Source	1974	1975	1976	1977	1978
TOTAL REVENUE	380,349	265,757	557,717	716,292	777,282
Customs	27,460	19,721	22,483	25,660	27,709
Forests	240,078	151,668	326,589	496,985	510,298
Lands	9,362	14,493	8,778	9,799	15,914
Licences and Internal Revenue	10,160	10,949	11,451	12,737	14,627
Fees of Court of Office etc.	1,326	1,371	1,395	1,703	2,133
Townships	-	-	-	-	-
Light, Water, etc.	816	967	422	1,009	820
Posts	-	-	-	-	-
Telegraphs	-	-	-	-	-
Railways	2,233	2,420	2,768	2,943	2,980
Interest and Dividends	21,466	21,049	28,905	36,722	59,191
Rents - Government Buildings	1,366	1,236	1,096	988	1,220
Ports and Marbours	2,715	2,831	3,119	3,269	3,888
Navigational Aids	-	-	-	-	-
Miscellaneous	13,552	9,336	56,150	34,753	19,529
Reinbursement by British Government	284	205	183	186	44
Other Revenue	49,531	29,511	94,378	90,538	18,920

Source: Accountant General

Table VIII-3 EXPORT OF MAJOR COMMODITIES

	1974	1975	1976	1977	1978	1979
PRIMARY AGRICULTURE PRODUCTS						
<u>Palm Oil</u>						
Export Volume (Ton)	87,998	124,569	121,011	111,042	126,866	136,366
Export Value (M\$ '000)	105,485	131,010	108,480	136,223	155,978	183,266
<u>Rubber</u>						
Export Volume (Ton)	31,604	32,031	35,804	38,823	36,804	33,205
Export Value (M\$ '000)	50,464	40,030	62,034	69,482	73,531	79,786
<u>Cocoa Beans</u>						
Export Volume (Kg)	4,503,583	5,417,865	6,264,589	6,991,735	8,239,896	9,688,461
Export Value (M\$ '000)	16,030	16,955	25,607	54,237	62,846	64,812
<u>Copra</u>						
Export Volume (Ton)	9,828	30,485	39,056	37,089	36,216	30,455
Export Value (M\$ '000)	10,683	14,425	19,908	30,677	31,183	34,471
<u>Palm Kernels</u>						
Export Volume (Ton)	20,446	24,249	23,865	15,594	18,260	15,774
Export Value (M\$ '000)	15,144	8,904	11,212	9,397	11,767	12,955
<u>Coconut Oil (Crude and Refined)</u>						
Export Volume (Ton)	184	337	656	1,011	493	432
Export Value (M\$ '000)	393	323	588	1,381	669	717
<u>Peper (Black & White)</u>						
Export Volume (Ton)	65	44	127	94	23	52
Export Value (M\$ '000)	239	136	437	353	121	243
FORESTRY PRODUCTS						
<u>Timber Logs</u>						
Export Volume (Cu, Metres)	9,731,730	8,989,773	12,059,813	12,327,442	12,363,893	9,780,512
Export Value (M\$ '000)	870,587	567,781	1,193,485	1,240,489	1,331,735	2,050,951
<u>Sawn Timber</u>						
Export Volume (Cu, Metres)	4,279	4,720	16,431	35,703	32,858	79,891
Export Value (M\$ '000)	857	809	4,376	11,975	7,974	26,903
FISH AND MARINE PRODUCTS						
<u>Prawns Chilled or Frozen</u>						
Export Volume (Ton)	1,850	1,679	2,384	2,679	2,913	3,039
Export Value (M\$ '000)	12,467	12,237	22,376	29,953	34,062	41,697
MINERALS						
<u>Petroleum Crude</u>						
Export Volume (Ton)	19,019	375,854	2,454,344	3,546,691	3,167,794	3,908,132
Export Value (M\$ '000)	3,945	85,503	584,811	903,609	1,005,090	1,288,147
<u>Copper Concentrates</u>						
Export Volume (Ton)	-	13,278	81,354	98,855	112,945	108,462
Export Value (M\$ '000)	-	11,341	73,561	82,421	97,522	134,335
SELECTED MANUFACTURED PRODUCTS						
<u>Veneer Sheet Max. 5mm Thick</u>						
Export Volume (Million sq.m.)	110.55	59.17	42.98	3.08	1.65	9.53
Export Value (M\$ '000)	8,494	2,987	3,812	3,725	1,378	10,024
<u>Plywood Plain</u>						
Export Volume (Million sq.m.)	2.22	4.66	4.07	3.22	1.48	2.6
Export Value (M\$ '000)	5,811	8,197	10,746	10,787	6,186	11,676
TOTAL MAJOR EXPORT (M\$ '000)	1,100,525	900,649	2,121,431	2,584,708	2,820,042	3,939,982 (a)
OTHER EXPORTS (M\$ '000)	92,984	110,580	96,199	119,609	140,085	193,196 (a)
TOTAL EXPORTS (M\$ '000)	1,193,509	1,011,229	2,217,629	2,704,317	2,960,127	4,133,177 (a)

(a) Provisional

Table VII-4 PADDY PRODUCTION

Unit: ton

	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76
SABAH	104,360.84	112,259.22	92,981.96(a)	108,301.10(a)	121,467.90(a)	88,411.08(a)*
Wet Paddy	95,739.40	103,725.51	84,866.53 *(14,844.48)	98,027.10 *(11,273.79)	110,604.93 *(12,424.80)	75,230.94 *(5,306.34)
Hill Paddy	6,921.44	6,915.14	6,508.29	8,389.71	9,880.83	12,270.85
Kendinga Paddy	1,700.00	1,618.57	1,607.14	1,884.29	982.14	909.29

Source: Department of Agriculture.

Note : Figures in the bracket are double cropping production which are not included in the Residencies and totals.

Due to the high non-response rate of wet paddy cutting test 1974/1975, only the yield estimate at state level are used.

(a) Double cropping production is not included in Residencies or totals

* Production drops due to floods mainly in Kota Belud District (around 10,000 acres affected during 1975).

Table VII-5 RICE IMPORT

Unit: Quantity = ton
Value = M\$1000

Year	TOTAL	Kota					Lahad		Semporna	Tawau
		Labuan	Kinabalu	Kudat	Sandakan	Datu				
1970	Quantity	1,510	9,482	2,985	10,468	2,117	1,118	8,626		
	Value	634.3	3,627.3	982.4	4,824.0	1,005.7	525.0	3,841.5		
1971	Quantity	1,982	8,953	5,292	11,675	2,013	1,635	10,985		
	Value	672.4	3,391.6	1,636.1	4,357.2	794.2	641.9	3,858.7		
1972	Quantity	2,701	8,408	4,929	11,305	2,226	1,416	13,865		
	Value	946.6	3,342.7	1,643.6	4,407.3	874.9	530.3	4,811.2		
1973	Quantity	1,218	20,357	1,937	13,902	1,521	696	13,597		
	Value	1,395.7	16,528.5	1,292.9	11,362.2	1,178.1	447.3	11,945.1		
1974	Quantity	530	15,367	2,361	11,643	19	-	13,011		
	Value	668.9	17,185.7	1,691.3	13,348.2	28.9	-	15,049.9		
1975	Quantity	878	14,009	526	11,800	29	-	13,425		
	Value	946.7	13,502.5	514.4	12,492.6	29.4	-	14,258.6		
1976	Quantity	106	14,047	166	11,113	57	-	13,217		
	Value	65.3	10,972.4	109.5	9,979.6	37.8	-	11,275.1		
1977	Quantity	581	19,539	38	15,236	61	-	20,404		
	Value	489.5	16,375.9	22.8	11,725.7	38.8	-	15,828.9		
1978	Quantity	40	28,182	27	15,327	33	-	22,466		
	Value	44.6	26,982.8	30.1	15,046.7	41.6	-	21,781.7		
1979	Quantity	3	26,980	21	20,104	40	-	21,653		
	Value	1.8	21,677.7	20.7	18,233.2	36.5	-	17,803.6		

Source: Annual Bulletin of Statistics, Sabah, 1979

Table VII-6 FOREST PRODUCTION

Particulars	Unit: 1000 cu-ft-true						
	1973	1974	1975	1976	1977	1978	
TOTAL EQUIVALENT IN ROUND TIMBER	392,575	276,028	322,430	446,252	420,793	463,182(a)	
Logs	390,367	274,115	319,906	444,526	419,485	461,805	
Sawn Timber	1,011	510	1,541	1,614	1,000	1,047	
Sleepers	-	21	-	-	-	-	
Shingles	8	-	-	-	-	-	
Roundwood (poles)	717	563	550	112	308	330	
Firewood	423	377	307	-	-	58,346(b)	
Charcoal	51	442	126	-	-	32,848(b)	

Source: Forest Department.

Note: 1 cubic foot true = 0.7855 cubic foot hoppus.
 (a) Excludes figures for firewood and charcoal.
 (b) Unit is in pikuls.

Table VII-7 POPULATION DISTRIBUTION AND DENSITY

Residency		Area (km ²)	Population growth rate (%)	Population (1,000) 1980	Density per km ²
Interior (18,398 km ²)	Beaufort	1,735.5	2.5	41	23.6
	Keningau	3,532.7	6.3	48	13.6
	Kuala Penyu	453.3	1.5	14	30.9
	Labuan	90.7	5.5	29	319.7
	Pensiangan	6,089.0	4.2	9	1.5
	Sipitang	2,732.5	3.4	14	5.1
	Tambunan	1,346.8	2.9	16	11.9
	Tenon	2,408.6	2.3	30	12.5
Kudat (4,623 km ²)	Kota Marudu	1,916.6	2.6	31	16.2
	Kudat	1,287.2	4.7	46	35.7
	Pitas	1,419.2	4.3	19	13.4
Sandakan (28,205 km ²)	Kinabatangan	17,593.9	7.6	29	1.6
	Labuk & Sugut	8,345.0	2.6	35	4.2
	Sandakan	2,266.1	6.0	130	57.4
Tawau (14,095 km ²)	Kunat	1,134.3	7.9	60	7.9
	Lahad Datu	6,500.8			
	Semporna	1,144.7	9.5	62	54.2
	Tawau	6,125.2	8.3	133	21.7
West Coast (7,589 km ²)	Kota Belud	1,385.7	3.5	51	36.8
	Kota Kinabalu	349.7	7.3	123	351.7
	Papar	1,243.3	3.1	46	37.0
	Penampang	466.3	5.1	43	92.2
	Ranau	2,978.5	3.9	34	11.4
	Tuaran	1,165.5	3.0	55	47.2

Source: Compiled by Survey Team

Table VII-8 RACIAL COMPOSITION OF POPULATION, SABAH : 1970 AND 1980

Year	Unit : %						Total
	Indigenous	Chinese	Malay	Indonesian	Filipino	Other	
1970	64.1	21.4	2.8	6.1	3.1	2.6	100.0
1980	53.0	17.0	5.1	10.6	12.2	2.0	100.0
Percentage change	-17.3	-20.6	+82.0	+74.0	+294.0	-23.1	

Source: 1970 Census SRPS

Table VII-9 AGE DISTRIBUTION OF POPULATION BY COMMUNITY 1970 AND 1980

Age-group	Year	Community Percentage			Total
		Indigenous	Chinese	Other	
0-4	1970	19.0	14.1	18.6	17.9
	1980	18.3	16.5	16.1	17.3
5-14	1970	30.4	28.3	26.2	29.3
	1980	28.9	23.1	27.0	27.3
15-24	1970	15.1	20.4	16.6	16.5
	1980	21.5	21.1	19.7	20.9
25-44	1970	24.1	21.5	30.2	24.4
	1980	19.5	24.7	24.7	21.9
45-64	1970	9.8	12.1	7.2	9.9
	1980	10.4	10.8	11.1	10.7
65+	1970	1.6	3.6	1.3	2.0
	1980	1.4	3.9	1.4	1.8

Table VII-10 WORKING AGE POPULATION AND LABOUR FORCE

Year	Total population aged 15 and 65	Labour force	Outside labour force	Labour force as percent of total
1970	331,849	199,750	132,099	60.2
1978	526,316	330,709	195,607	62.8
1980	584,103	366,910	217,193	62.8

Source: SRPS Appendix Section C.3 and C.10

Table VII-11 STRUCTURE OF THE LABOUR FORCE IN 1970 AND 1978

Sector	Percent of labour force in year		AAGR* in employment 1970 to 1978 (percent)
	1970	1978	
Paddy	32.8	23.3	1.2
Logging/timber	4.7	5.5	7.6
Fishing	3.1	7.1	17.3
Rubber	8.9	8.0	4.3
Oil palm	3.0	3.2	6.9
Coconuts, cocoa, SLDB	2.8	4.0	53.0
Other agriculture	3.9	3.9	5.7
Mining and quarrying	0.4	0.7	12.0
Manufacturing	3.3	4.0	10.0
Construction	2.9	4.2	10.4
Electricity, gas, water and sanitary service	0.7	0.8	7.9
Commerce	5.5	10.8	14.9
Transport, Storage and communications	3.3	6.4	15.1
Services			
- Government	7.2	5.6	2.3
- Other	8.0	11.2	10.2
Other	9.6	1.2	n/a
Total	100.0	100.0	5.7

* AAGR = Average Annual Growth Rate

Source: SRPS Estimates

Table VII-12(1) ON-GOING AND PROPOSED DEVELOPMENT PROJECT
IN KINABATANGAN RIVER BASIN

Name of Project	Agency	Location	Acreage	Remarks
Settlement Scheme	FELDA	Bukit Garam	23,000	Started
Settlement Scheme	SLDB	Suan Lamba	1,800	
Settlement Scheme	KPD	Entelibon	1,000	Shed Tree Planted
Small Holders Scheme	Land and Survey Department	Lokan	35,200	
Small Holders Scheme	Land and Survey Department	Koyah (A)	13,277	Under Settlement
Small Holders Scheme	Land and Survey Department	Koyah (B)	3,000	Under Settlement
Small Holders Scheme	Land and Survey Department	Koyah (C)	6,000	Under Settlement
Small Holders Scheme	Land and Survey Department	Tenegang	65,700	
Small Holders Scheme	Land and Survey Department	Luan Manis	6,000	
Small Holders Scheme	Land and Survey Department	Nabawan	50,000	
Small Holders Scheme	Rubber Fund Board	Sukau	2,400	
Small Holders Project	Agriculture Department	Lokan	1,500	6% Planted
Small Holders Project	Agriculture Department	Kuamut	2,000	30% Planted

Table VII-12(2) ON-GOING AND PROPOSED DEVELOPMENT PROJECT
IN KINABATANGAN RIVER BASIN

(Continued)

Name of Project	Agency	Location	Acreage	Remarks
Experimental Paddy Project	Paddy Board	Bukit Garam	200	25% operated
Rattan Development Project	SAFODA	Lamag	27,500	Started in 1980
Regional Plan	SEPU	Tongod	15,000	Proposed
City Plan	Town Board	Bukit Garam	4,500	Started
Joint Venture or Private Estate, etc. /1	---	Down Stream of Balat	180,000	Some started

Note: This table has been tentatively prepared based on available information provided by the concerned agency.

/1: Some government bodies' project may be included.

Table VII-13 LAND ALIENATION BY CROPS, 1977 (KINABATANGAN DISTRICT)

Grade No.	F.R.		N.T.		P.L.		C.L.		Total	
	acre	No.	acre	No.	acre	No.	acre	No.	acre	No.
01. Paddy	-	-	103.70	20	-	-	-	-	103.70	20
02. Rubber	66.99	5	3.53	1	772.91	30	3,072.13	9	3,915.56	45
03. Sago	-	-	-	-	-	-	-	-	-	-
04. Coconut	-	-	192.56	30	45.38	2	29.35	1	267.29	33
05. Vegetable	-	-	-	-	-	-	-	-	-	-
06. Fruit	-	-	6.08	4	-	-	-	-	6.08	4
07. Garden	-	-	-	-	-	-	-	-	-	-
08. General Cul.	178.96	17	874.37	175	0.12	1	-	-	1,053.45	193
09. Oil Palm	49.57	6	-	-	-	-	6,454.00	1	6,503.57	7
10. Not Available	405.85	83	6,017.33	1,069	1,007.00	3	21,743.00	8	29,173.18	1,163
11. Other Crops	0.52	1	27.66	6	-	-	-	-	28.18	7
12. Others	-	-	-	-	-	-	-	-	-	-
13. Homestead	-	-	3.08	2	-	-	-	-	3.08	2
Total	701.89	112	7,228.31	1,307	1,825.41	36	31,298.48	19	41,054.09	1,474

Note: F.R. --- Field Register for Native (Temporary)
 N.T. --- Native Title (Permanent)
 P.L. --- Provisional Lease (Temporary)
 C.L. --- Country Lease, Open for All People

Source: Land Alienation by Crops 1977

Table VII-14 GROWTH RATE OF POPULATION
BY DISTRICT IN SABAH

District	Population (10 ³ persons)		Growth Rate of the Population (%) (1970 - 1980)
	1970	1980	
Pantai Barat Residency			
Kota Kinabalu	61	112	6.3
Tuaran	41	49	1.8
Penampang	26	39	4.1
Papar	34	41	1.9
Kota Belud	36	46	2.5
Ranau	23	31	3.0
Sub-total	221	318	3.7
Kudat Residency			
Kota Marudu	24	28	1.6
Kudat	29	41	3.5
Pitas	13	17	2.7
Sub-total	66	86	2.7
Perdalaman Residency			
Keningau	26	43	5.2
Tenom	24	27	1.2
Beaufort	32	37	1.5
Kuala Penyu	12	13	0.8
Sipitang	10	12	1.8
Nabawan/Pensiangan	6	8	2.9
Tambunan	12	15	2.3
Labuan	17	26	4.3
Sub-total	139	181	2.7
Sandakan Residency			
Labuk & Sugut	27	32	1.7
Kinabatangan	14	26	6.4
Sandakan	73	118	4.9
Sub-total	114	176	4.4
Tawau Residency			
Tawau	60	121	7.3
Lahat Datu	29	54	6.4
Semporna	25	56	8.4
Sub-total	114	231	7.3
SABAH STATE	654	992	4.3

Table VII-15 FUTURE POPULATION BY DISTRICT

Unit: 10³ persons

District	1970	1980	1990	2000
Pantai Barat Residency				
Kota Kanabalu	61	123	220	364
Tuaran	41	55	57	56
Penampang	26	43	54	65
Papar	34	46	48	47
Kota Belud	36	51	56	59
Ranau	23	34	39	43
Sub-total	221	352	474	634
Kudat Residency				
Kota Marudu	24	31	32	32
Kudat	29	46	58	72
Pitas	13	19	21	22
Sub-total	66	96	111	126
Perdalaman Residency				
Keningau	26	48	67	90
Tenom	24	30	31	30
Beaufort	32	41	41	39
Kuala Penyu	12	14	14	13
Sipitang	10	14	14	14
Nabawan/Pensiangan	6	9	11	13
Tambunan	12	16	18	19
Labuan	17	29	38	48
Sub-total	139	201	234	266
Sandakan Residency				
Labuk & Sugut	27	35	37	38
Kinabatangan	14	29	47	73
Sandakan	73	130	207	318
Sub-total	114	194	291	429
Tawau Residency				
Tawau	60	133	212	336
Lahat Datu	29	60	95	149
Semporna	25	62	96	158
Sub-total	114	255	403	643
SABAH STATE	654	1,098	1,513	2,098

Table VII-16 FUTURE LABOUR FORCE BY DISTRICT

Unit: 10³ persons

District	1980	1990	2000
PantaiBarat Residency			
Kota Kanabalu	41.8	74.8	123.7
Tuaran	18.7	19.3	19.0
Penampang	14.6	18.3	22.1
Papar	15.6	16.3	15.9
Kota Belud	17.3	19.0	20.0
Ranau	11.5	13.2	14.6
Sub-total	119.6	161.1	215.5
Kudat Residency			
Kota Marudu	10.5	10.8	10.8
Kudat	15.6	19.7	24.4
Pitas	6.4	7.1	7.4
Sub-total	32.6	37.7	42.8
Perdalaman Residency			
Keningau	16.3	22.7	30.6
Tenom	10.2	10.5	10.2
Beaufort	13.9	13.9	13.2
Kuala Penyu	4.7	4.7	4.4
Sipitang	4.7	4.7	4.7
Nabawan/Pensiangan	3.0	3.7	4.4
Tambunan	5.4	6.1	6.4
Labuan	9.8	12.9	16.3
Sub-total	68.3	79.5	90.4
Sandakan Residency			
Labuk & Sugut	11.9	12.5	12.9
Kinabatangan	9.8	15.9	24.8
Sandakan	44.2	70.3	108.1
Sub-total	65.9	98.9	145.8
Tawau Residency			
Tawau	45.2	72.0	114.2
Lahat Datu	20.4	32.3	50.6
Semporna	21.0	32.6	53.7
Sub-total	86.7	137.0	218.6
SABAH STATE	373.3	514.4	713.3

Table VII-17 RESETTLEMENT COST

Unit: 10³M\$

	Unit	Quantity	Total
1) Housing Cost			
Staff quaters	house	220	7,150
Settler's house	- do -	3,780	18,300
Hospital	- do -	11	297
School	- do -	11	308
Moscue	- do -	11	308
General Store	- do -	11	440
2) Transportation Cost	L.S.	1	478
3) Power Supply	L.S.	1	352
Total			37,683

VIII. PROJECT ECONOMY



VIII. CONTENTS OF PROJECT ECONOMY

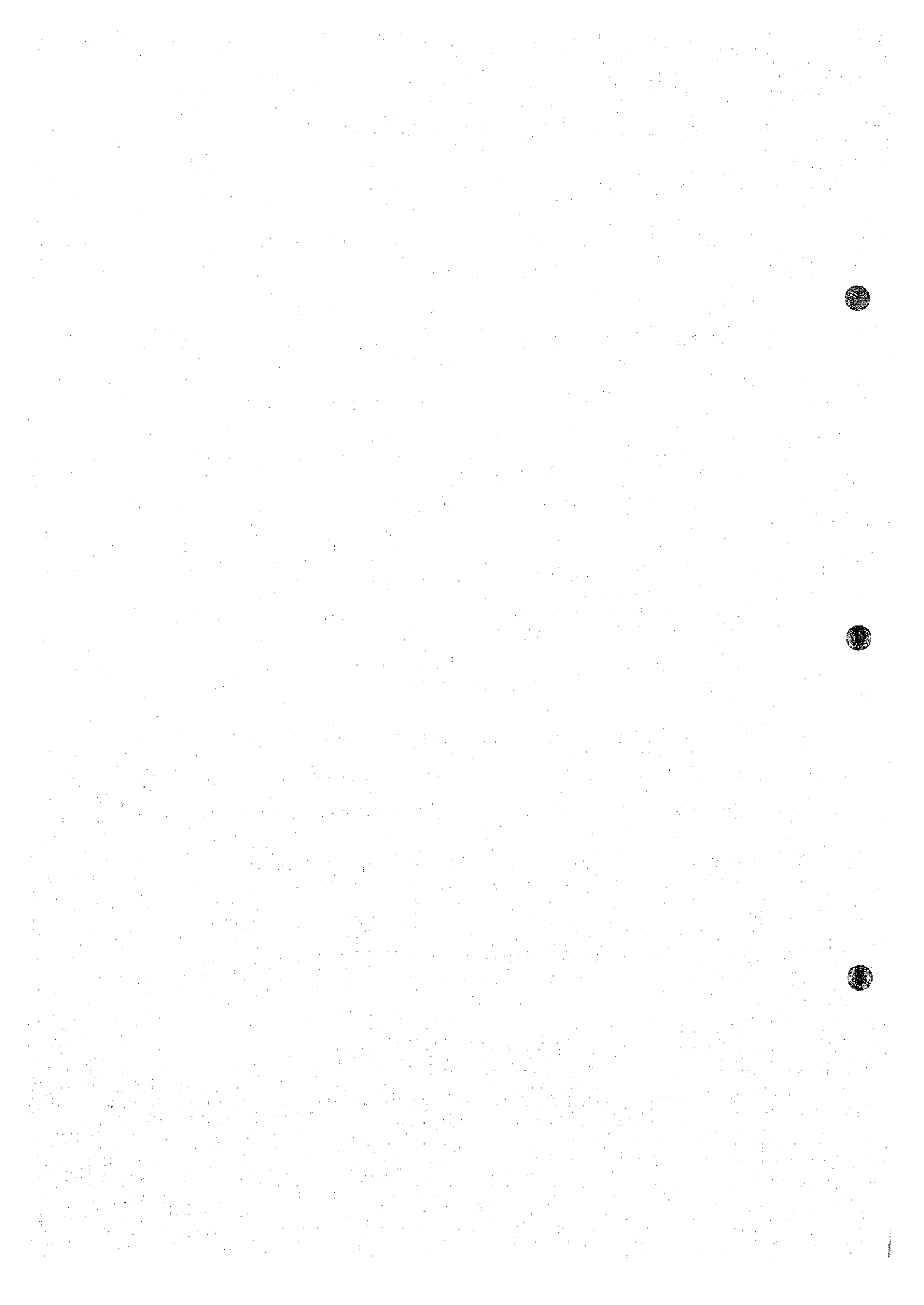
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1. GENERAL

This sector deals with the economic evaluation of the project. The project would substantially reduce flood damage by construction of the dam and increase the agricultural production through the conversion of the present flood prone area to agricultural use. Hydro power sector which will support the demand in Sandakan city would be taken into consideration in this report.

The economic viability of this project will be evaluated as a package of development plans for flood control, agriculture and hydro power generation, by means of calculating Internal Rate of Return.

The assessment of economic viability of the project will be made on the basis of the terms of the implementing schedule mentioned elsewhere in this report.

Sensitivity analysis is also made with regard to any change in the implementing schedule and the expected quantity of rice produced.

Malaysian Ringgit and Japanese Yen are converted to US Dollar at the exchange rates of M\$2.30 to US\$1.00 and ¥230 to US\$ 1.00. The project life for the economic evaluation is fixed at 50 years.

2. PROJECT COST

The total project cost is estimated at US\$1,050 million, on the basis of 1981 prices, of which US\$622 million is in foreign currency, and US\$428 million is in local currency. The quantity of works is estimated on the basis of the preliminary design which has been prepared during the study period. Unit prices and the costs of equipment required for the project implementation are in line with the recent bid prices for similar works. The taxes and duties are included in these prices and costs. Physical contingencies of 10% have been applied to all the works and equipment costs. Price contingencies are also taken into account at an annual escalation rate of 7% for foreign currency and for local currency.

The project cost is classified by work item given as follows.

<u>Work</u>	<u>(x10⁶ US\$)</u>		
	<u>Foreign portion</u>	<u>Local portion</u>	<u>Total</u>
Dam & Reservoir	141.3	147.1	288.4
Agricultural development	422.3	270.9	693.2
Hydro power development	58.1	10.6	68.7
Total	621.7	428.6	1,050.3

Table VIII-1 shows the annual disbursement of the project cost.

3. ECONOMIC EVALUATION

3.1 PROJECT BENEFIT

The project benefit may be classified into primary and secondary benefit. The actual figure has been presented only for the primary benefit.

3.1.1 Primary Benefit

Economic values have been assigned to the flood control and the water supplied for irrigation and hydro power use, in monetary terms, and annual benefits are summarised below:

<u>Sector</u>		<u>Annual benefit</u>
Flood control	:	0.29
Agricultural development	:	77.04
Hydro power development	:	3.70
Total	:	81.03

The flood control benefit will begin to accrue in 1993 that is, after completion of Balat dam due to its regulation effectiveness.

As agricultural development will be expanded stepwise during a period of 10 years, the agriculture benefit can be expected to accrue from the area after completion of all the related works. However, the annual average benefit will not be brought about immediately thence forward. The build-up period of agriculture benefit is assumed to be five years after completion of the related works, during which time the benefit will increase linerly.

Benefit from power generation is to accrue in 1993 year, when all the works required for power generation are completed.

The benefit of each sector is assumed to accrue in annual terms throughout the project life.

3.1.2 Secondary Benefit

Some benefits expected from the project are to be identified as the secondary benefits.

They include such benefits as promotion of recreation/ tourism, provision of infrastructure, and development of fishing culture by using the reservoir, and some portion of the cut-down trees in the course of land clearance may also be utilized as the timber logs for local use.

In addition, the project will contribute much to saving of foreign currency.

Though the State of Sabah has imported about 63,000 tons of rice in 1978, the project area is expected to bring about surplus production of rice within a short time. After completion of the project, rice production will increase by 239×10^3 tons, which will contribute in saving foreign currency in Malaysia through reduction of rice import. If all this production is consumed in whole Malaysia, the foreign currency can be saved by US\$129 million per annum in full-operation stage of the rice production.

Furthermore, the surplus production of rice can compensate the shortage of rice in peninsular Malaysia or Sarawak State.

The foreign currency can be saved through reduction of rice import by US\$129 million per annum in full-operation stage of the rice production.

3.2 ECONOMIC COST

3.2.1 Construction Cost

Estimation of costs required for materials, equipment and engineering services, which are to be procured by international competitive bidding, is based on the international price levels. The local cost is estimated on the basis of the prevailing prices for similar works which are now going on in and around the project area.

The construction cost includes that for construction of dam and its appurtenant facilities, agricultural development, and hydro power generation. The total economic construction cost is estimated at US\$705.3 million, which is composed of foreign currency portion of US\$410.5 million and local currency portion of US\$294.8 million equivalent. These costs are summarized below.

<u>Work</u>	(x10 ⁶ US\$)		
	<u>Foreign portion</u>	<u>Local portion</u>	<u>Total</u>
Dam & reservoir	96.8	106.2	203.0
Agricultural development	279.6	182.4	462.0
Hydro power development	34.1	6.2	40.3
Total	410.5	294.8	705.3

Table VIII-2, -3 and -4 show the economic construction cost of each work, and Table-5 shows the annual disbursement of the economic cost.

3.2.2 Cost Allocation

To identify the equitable cost for each purpose, the economic cost for dam construction has been allocated according to the share ratio of the reservoir capacity for flood control and agricultural development. The result of cost allocation is as follows:

<u>Sector</u>	(x 10 ⁶ US\$)		
	<u>Foreign portion</u>	<u>Local portion</u>	<u>Total</u>
Flood control	94.4	103.5	197.9
Agricultural development	2.4	2.7	5.1
Total	96.8	106.2	203.0

The cost for power generation is excluded from the cost for dam construction, since any reservoir capacity will not be allocated for hydro power generation.

3.2.3 Cost Estimate by Purpose

Based on the above allocation of the dam construction cost, the total project economic cost can be further classified by each purpose as follows:

<u>Sector</u>	<u>(x10⁶ US\$)</u>		
	<u>Foreign portion</u>	<u>Local portion</u>	<u>Total</u>
Flood control	94.4	103.5	197.9
Agricultural development	282.0	185.1	467.1
Hydro power development	34.1	6.2	40.3
Total	410.5	294.8	705.3

3.2.4 Operation and Maintenance Cost

To assure the benefits throughout the project life, the related facilities should be successfully operated and safely maintained. The annual cost for operation and maintenance is estimated at US\$55.55 million, which is composed of;

<u>Work</u>	<u>Annual cost (x10⁶ US\$)</u>
Dam & Reservoir	0.15
Agricultural development	54.60
Hydro power development	0.80
Total	55.55

3.2.5 Replacement Cost

Facilities related to the project are to be replaced periodically to attain their original purposes during the project life; the facilities to be replaced and their costs are summarized as below:

<u>Work</u>	<u>Total cost (x10⁶ US\$)</u>
Dam & Reservoir	7.4
Agricultural development	685.1
Hydro power development	19.6

3.3 INTERNAL RATE OF RETURN

Evaluation of the project was made by means of calculating Internal Rate of Return (IRR) on the basis of the estimated benefit and economic cost. The Internal Rate of Return is calculated at 7.1% assuming a project life of 50 years.

Table VIII-6 shows the annual disbursement of the economic cost and benefit which are utilized to calculate the Internal Rate of Return.

3.4 SENSITIVITY ANALYSIS

Sensitivity analysis has also been made on the assumptions of 1) reduction of the expected rice production, 2) extension of construction period and 3) increase of construction cost.

The results are summarized below.

	<u>IRR (%)</u>
1) Reduction of rice production (-10%)	5.5
2) Construction period (10 years extension)	6.4
3) Increase of construction cost (+10%)	5.6

Fig. VIII-1 shows the present value of cost and benefit by discount rate.

4. SOCIO-ECONOMIC IMPACTS

In addition to the benefits stipulated in the economic evaluation, favourable socio-economic impacts are anticipated from the implementation of the project.

Improvement of local transportation will result from the construction of the access road to damsite and of farm road. The expanded road system will not only promote the economic activity in the region but also contribute to inter-regional transportation and communications.

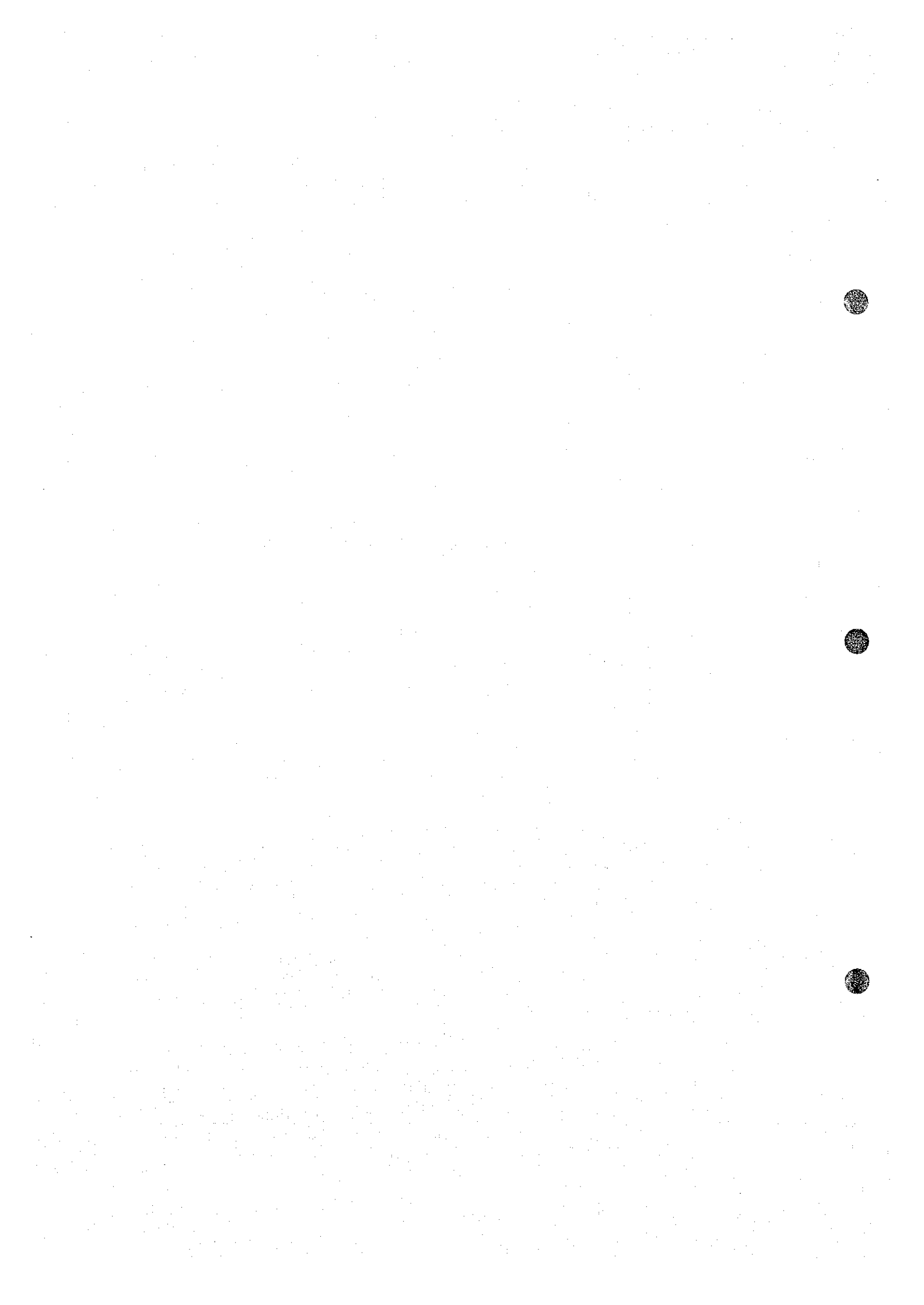
The enhanced economic activity through the increases of agricultural production, and the improved living condition by the completion of the flood control measures, will also substantially facilitate socio-economic stability in the region.

Furthermore, agro-based industrial activities will come to flourish with the increase of agricultural production, mechanized farming and provision of infrastructural facilities.

However, implementation of the project requires acquisition of a considerable land for the area of dam and reservoir and over 850 families will have to be moved out elsewhere even though they may be fully compensated for their lands and quarters. The community life of the people living in the adjacent area will also be seriously affected.

Therefore, restoration of the local communities and resettlement of the displaced people needs to be implemented very carefully for the successful implementation of the project.

The river channel will also be expected to play a part of the transportation system for both the passengers and the timber logs, while the role for the timber transport may reduce in parallel with the dwindling of the timber product. However, as the river navigation will be interrupted by dam construction, the access road will take over some portion of the role of the river channel.



T A B L E & F I G U R E

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Table VIII-1 ANNUAL DISBURSEMENT OF THE PROJECT COST

Unit : x10⁶ US\$

WORK ITEM	GRAND TOTAL	1982 (1st)		1983 (2nd)		1984 (3rd)		1985 (4th)		1986 (5th)			
		F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.		
Dam	288.35	141.28	147.07	---	---	0.62	0.18	1.34	0.40	7.14	16.91	15.97	24.86
Agricultural Development	693.17	422.32	270.85	---	---	3.19	0.83	5.12	1.46	6.41	4.48	26.79	21.18
Hydro Power Development	68.65	58.08	10.57	---	---	0.37	0.09	0.37	0.10	---	---	---	---
Total	1050.17	621.68	428.49			4.18	1.10	6.83	1.96	13.55	21.29	42.76	46.04

(CONTINUED)

WORK ITEM	1987 (6th)		1988 (7th)		1989 (8th)		1990 (9th)		1991 (10th)		1992 (11th)	
	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
Dam	15.72	23.99	20.20	14.10	24.18	17.96	24.99	21.61	17.04	15.50	14.08	11.56
Agricultural Development	45.07	35.02	62.15	39.61	66.50	42.53	71.15	45.30	76.13	48.47	59.81	31.97
Hydro Power Development	---	---	---	---	---	---	19.00	3.00	18.70	3.57	20.04	3.81
Total	60.79	59.01	82.35	53.71	90.68	60.49	115.14	69.91	111.47	67.59	93.93	47.34

Note : F.C. : Foreign Currency
L.C. : Local Currency

Table VIII-2 ECONOMIC CONSTRUCTION COST OF BALAT DAM

Unit : 10³ US\$

Work Item	Foreign Currency	Local Currency	Total
1. Main Work			
Access Road	2,900	3,500	6,400
Diversion	10,000	7,200	17,200
Dam Body	11,000	12,500	23,500
Spillway	24,200	22,000	46,200
Outlet Facility	21,900	12,000	33,900
Preparatory Work	7,000	5,700	12,700
Sub Total	77,000	62,900	139,900
2. Land Acquisition and House Evacuation	-	30,800	30,800
3. Engineering Service	11,000	3,000	14,000
4. Physical Contingency	8,800	9,700	18,500
Total	96,800	106,200	203,000

Table VIII-3 ECONOMIC CONSTRUCTION COST FOR AGRICULTURAL DEVELOPMENT

Unit: 10³ US\$

Work Item	Foreign Currency	Local Currency	Total Total
1. Main Work			
Jungle Clearing & Levelling	38,000	33,600	71,600
Irrigation, Drainage, Farm Road, Related Structures	63,400	77,100	140,500
Preparatory work	10,100	11,100	21,200
Sub Total	111,500	121,800	233,300
2. Agricultural Production Facilities			
Buildings & Equipment for Office, Workshop and Pilot Farm	14,400	2,500	16,900
Rice Mill & Farm Machinery	99,300	15,300	114,600
Sub Total	113,700	17,800	131,500
3. Resettlement Scheme	-	16,400	16,400
4. Land Acquisition	-	2,500	2,500
5. Engineering Service	29,000	7,300	36,300
6. Physical Contingency	25,400	16,600	42,000
Total	279,600	182,400	462,000

Table VIII-4 ECONOMIC CONSTRUCTION COST FOR HYDRO POWER DEVELOPMENT

Unit : 10³US\$

Work Item	Foreign Currency	Local Currency	Total
1. Main Works			
Civil Works	800	700	1,500
Power House	1,900	900	2,800
Generating Equipment	18,200	1,400	19,600
Transmission Line	4,900	1,500	6,400
Preparatory Work	2,600	400	3,000
Sub Total	28,400	4,900	33,300
2. Engineering Service	2,600	700	3,300
3. Physical Contingency	3,100	600	3,700
Total	34,100	6,200	40,300

Table VIII-5 ANNUAL DISBURSEMENT OF THE ECONOMIC COST

Unit : x10⁶ US\$

WORK ITEM	GRAND TOTAL	TOTAL		1982 (1st)		1983 (2nd)		1984 (3rd)		1985 (4th)		1986 (5th)	
		F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
Dam	203.00	96.80	106.20	---	---	0.62	0.18	1.25	0.37	6.24	15.07	13.04	20.59
Agricultural Development	462.00	279.60	182.40	---	---	3.19	0.83	4.79	1.36	5.60	4.31	21.87	17.69
Hydro Power Development	40.30	34.10	6.20	---	---	0.37	0.09	0.35	0.09	---	---	---	---
Total	705.30	410.50	294.80			4.18	1.10	6.39	1.82	11.84	19.38	34.91	38.28

(CONTINUED)

WORK ITEM	1987 (6th)		1988 (7th)		1989 (8th)		1990 (9th)		1991 (10th)		1992 (11th)	
	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
Dam	12.00	18.60	14.40	10.35	16.11	12.27	15.56	13.46	9.92	9.02	7.66	6.21
Agricultural Development	34.38	27.12	44.31	28.64	44.31	28.64	44.31	28.21	44.31	28.21	32.53	17.39
Hydro Power Development	---	---	---	---	---	---	11.83	1.87	10.65	2.08	10.90	2.07
Total	46.38	45.72	58.71	38.99	60.42	40.91	71.7	43.54	64.88	39.31	51.09	25.75

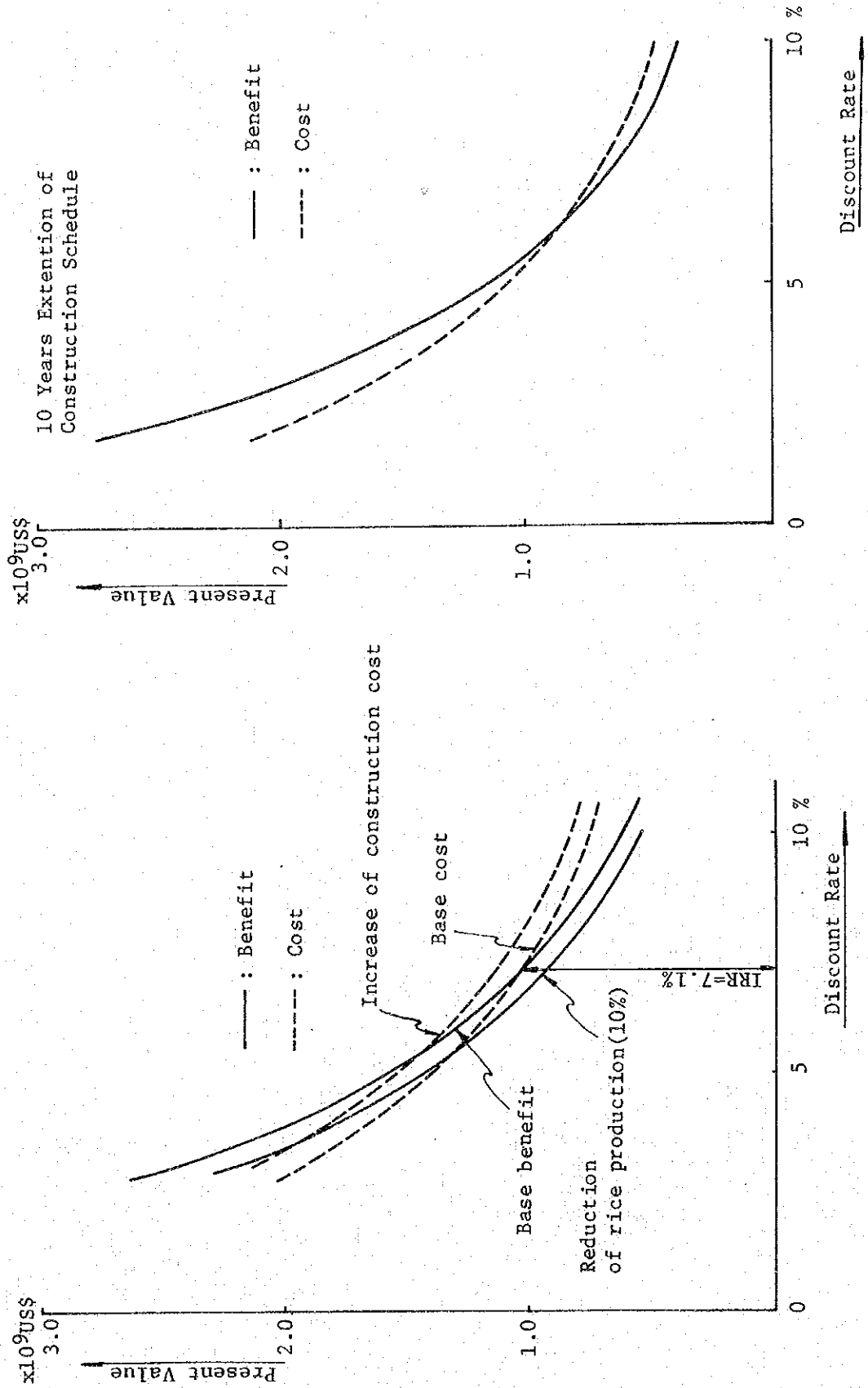
Note : F.C. ; Foreign Currency
L.C. ; Local Currency

Table VIII-3 ANNUAL DISBURSEMENT OF THE ECONOMIC COST AND BENEFIT

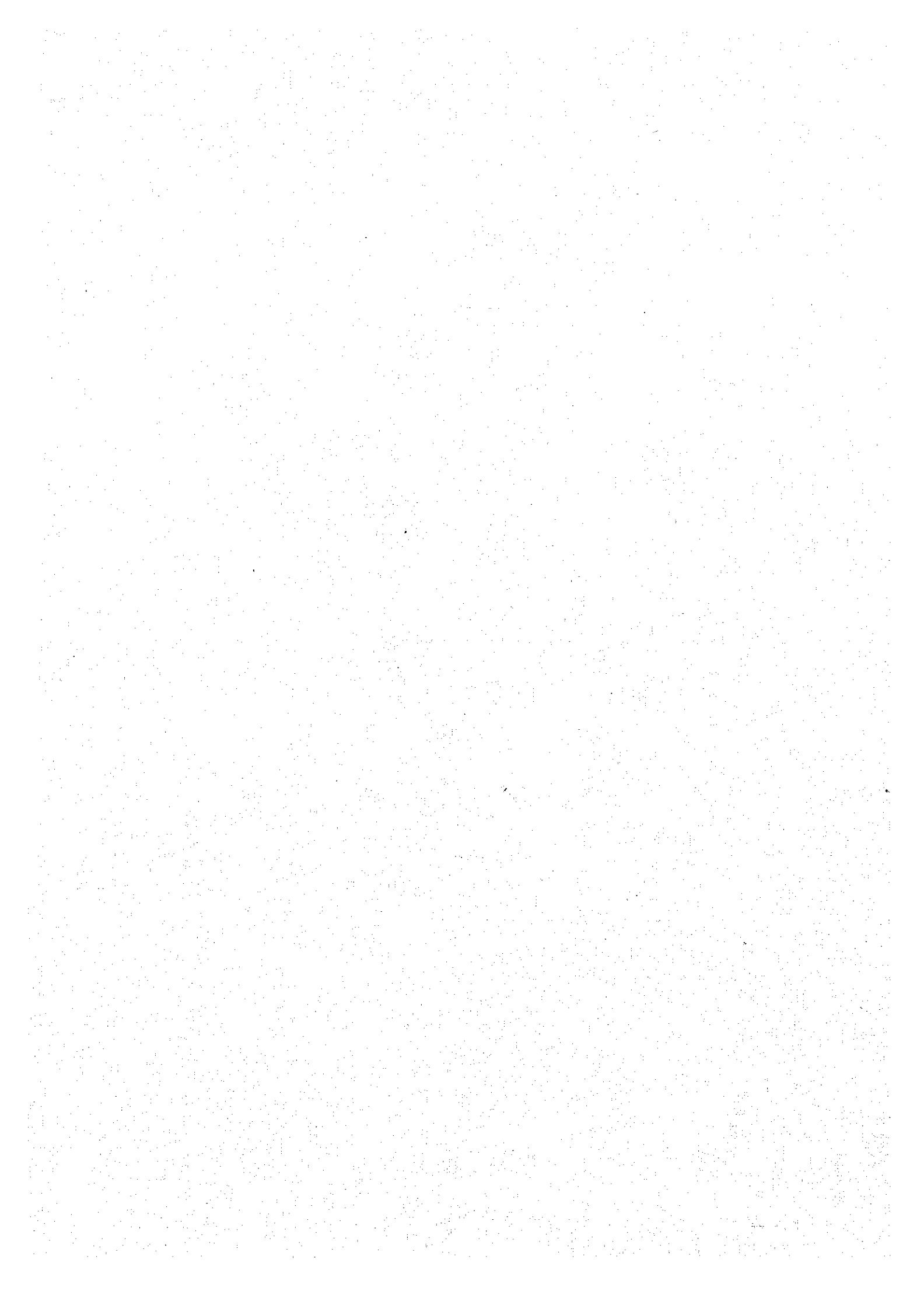
(Unit: x 10⁶ US\$)

	COST										BENEFIT										
	CONSTRUCTION COST					O & M COST					REPLACEMENT COST			COST			BENEFIT				
	Dam	Agric.	Power	TOTAL	Dam	Agric.	Power	TOTAL	Dam	Agric.	Power	TOTAL	Flood Control	Agric.	Power	TOTAL	Flood Control	Agric.	Power	TOTAL	
1982																					
1983	0.8	4.0	0.5	5.3																	
1984	1.6	6.2	0.4	8.2																	
1985	21.3	9.9		31.2																	
1986	33.6	39.6		73.2																	
1987	30.6	61.5		92.1																	
1988	24.8	73.0		97.8																	
1989	28.4	"		101.4																	
1990	29.1	"	13.7	115.8																	
1991	18.9	72.5	12.7	104.1																	
1992	14.2	49.5	13.0	76.7																	
1993					0.2	22.9		22.9													
1994					"	54.6	0.8	55.6													
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Fig. VIII-1 PRESENT VALUE OF COST AND BENEFIT BY DISCOUNT RATE







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