TABLE G-1-1 Rural Development Budget for the Sixth National Development Plan (1987-1991)

Plan	1987 Amount (Million ฿)	1987 Percent*	1988	1989	1990	1991
(1) Five Ministries	13,017.37					
1.1 Agriculture	5,787.10	35.8	← 35.8% →			
1.2 Interior	3,314.58	15.0	← 15.0% →			
1.3 Education	787.67	2.3	← 2.3% →			
1.4 Public Health	2,801.38	29.7	← 29.7% →			
1.5 Industry	326.64	37.8	← 37.8% →			
(2) Budget for Coordinate with private sector	2,130.00	-	2,130.00	2,130.00	2,130.00	2,130.00
(3) Administration budget	29.75	-	29.75	29.75	29.75	29.75
Total	15,177.12	-	-	-	-	-

Note: * Percent of total budget of the ministry.

Source: Rural Development Plan (1987-1991), NESDB.

TABLE G-1-2 Budgets for Rural Development allocated by Ministries and Problems Solving, 1987

Ministry	Number of Project	Infrastructure	Production and Income	Health	Water Resources	Education & Knowledge	Total
(1) Agriculture and Cooperatives	83	557.45	3,552.24	9.16	1,589.91	82.00	5,790.66
(2) Interior	34	2,203.39	69.97	12.66	873.38	155.18	3,314.58
(3) Education	24	-	-	-	-	787.67	787.67
(4) Public Health	13	-	-	2,615.03	76.91	109.44	2,801.38
(5) Industry	2	-	43.47	-	283.17	-	326.64
Total	156	2,760.84	3,669.68	2,636.85	2,823.27	1,134.29	13,020.93

Source: NESDB

TABLE G-1-3 Comparison of Rural Development Budget in the Project Area, Fiscal Year 1991

Problems	Phitsanulok	Sukhothai	Kampheang Phet	Tak	Total	(%)
Socio-Economic Structure	155,320,725	105,256,388	110,038,259	98,673,070	469,288,442	(26.40)
Production	27,930,954	48,253,542	36,151,645	35,800,580	148,136,721	(8.33)
Public Health	75,315,490	40,305,580	34,343,003	15,515,600	165,479,673	(9.31)
Water Supply	228,206,433	430,146,295	170,067,760	87,425,000	915,845,488	(51.53)
Knowledge	29,141,447	23,842,573	15,267,930	10,350,265	78,602,215	(4.43)
Total	516,025,129	647,804,378	366,868,597	247,764,515	1,777,352,539	
	(29.02)	(36.43)	(20.63)	(13.93)	(100.00)	

Note: The figures in parenthesis are percentage

TABLE G-1-4 Rural Development Budget, Fiscal Year 1991,

Changwat Phitsanulok

Unit: Baht

Project Handle by	Socio-Economic Structure	Production	Public Health	Water Supply	Knowledge	Total	
						Amount	Percent
Public Project							
Ministry of Agriculture	11,189,100	22,105,938	-	156,952,260	-	190,247,298	36.86
Ministry of Interior	133,484,200	3,864,386	20,000	36,351,608	1,346,780	174,542,054	33.82
Ministry of Health	-	-	75,295,490	-	-	75,295,490	14.59
Ministry of Education	-	-	-	-	26,040,267	26,040,267	5.05
Ministry of Industry	-	202,630	-	3,016,800	-	3,219,430	0.63
Ministry of Commerce	-	150,000	-	-	1,003,000	1,153,000	0.23
Private Project	10,647,425	2,243,000	-	31,885,765	751,400	45,527,590	8.82
Total	155,320,725	27,930,954	75,315,490	228,206,433	29,141,447	516,025,129	100.00

Source: Provincial Rural Development Plan in Fiscal Year 1991, Changwat Phitsanulok

TABLE G-1-5 Rural Development Budget, Fiscal Year 1991,
Changwat Sukhothai

Unit: Baht

Project Handle by	Socio-Economic Structure	Production	Public Health	Water Supply	Knowledge	Total	
						Amount	Percent
Public Project							
Ministry of Agriculture	14,402,450	42,372,120	-	70,507,610	55,000	127,337,183	19.65
Ministry of Interior	72,627,458	5,265,520	-	319,833,748	1,008,610	398,735,333	61.55
Ministry of Health	-	-	40,124,275	2,814,800	838,685	43,777,760	6.76
Ministry of Education	-	-	-	-	21,282,883	21,282,883	3.28
Ministry of Industry	-	325,055	-	1,557,400	-	1,882,455	0.29
Ministry of Commerce	-	260,844	-	-	-	260,844	0.05
Private Project	16,226,480	30,000	181,305	35,432,740	657,395	54,527,920	8.42
Total	105,256,388	48,253,542	40,305,580	430,146,295	23,842,573	647,804,378	100.00

Source: Provincial Rural Development Plan in Fiscal Year 1991, Changwat Sukhothai

TABLE G-1-6 Rural Development Budget, Fiscal Year 1991,
Changwat Kampheang Phet

Unit: Baht

Project Handle by	Socio-Economic Structure	Production	Public Health	Water Supply	Knowledge	Total	
						Amount	Percent
Public Project							
Ministry of Agriculture	36,348,385	33,381,220	-	80,883,400	178,000	150,791,005	41.10
Ministry of Interior	69,021,979	1,386,560	23,000	50,938,472	1,544,420	122,914,435	33.50
Ministry of Health	-	-	33,185,003	5,722,500	1,241,395	40,148,898	10.94
Ministry of Education	-	-	-	-	11,166,665	11,166,665	3.04
Ministry of Industry	-	826,465	-	1,388,900	-	2,215,365	0.60
Ministry of Commerce	-	239,400	-	-	-	239,400	0.07
Private Project	4,667,895	318,000	1,135,000	32,134,484	32,134,484	39,392,829	10.74
Total	110,038,259	36,151,645	34,343,003	170,067,760	170,067,760	336,868,597	100.00

Source: Provincial Rural Development Plan in Fiscal Year 1991, Changwat Kampheang Phet

TABLE G-1-7 Rural Development Budget, Fiscal Year 1991,
Changwat Tak

Unit: Baht

Project Handle by	Socio-Economic Structure	Production	Public Health	Water Supply	Knowledge	Total	
						Amount	Percent
Public Project							
Ministry of Agriculture	500,900	34,119,675	-	50,145,000	-	84,865,575	34.25
Ministry of Interior	67,331,370	1,598,900	-	21,533,136	2,537,080	93,000,686	37.54
Ministry of Health	24,607,600	-	15,515,600	-	-	40,123,200	16.19
Ministry of Education	-	-	-	-	7,528,385	7,528,385	3.04
Ministry of Industry	-	72,005	-	1,044,000	270,800	1,386,805	0.56
Ministry of Commerce	-	10,000	-	-	14,000	24,000	0.01
Office of Priminister	5,715,000	-	-	14,514,864	-	20,229,864	8.16
Private Project	418,000	-	-	188,000	-	606,000	0.25
Total	98,673,070	35,800,580	15,515,600	87,425,000	10,350,265	247,764,515	100.00

Source: Provincial Rural Development Plan in Fiscal Year 1991, Changwat Tak

TABLE G-1-8 Comparison of Rural Development Budget for Ministry of Interior in the Project Area, Fiscal Year 1991.

Problem	Phitsanulok	Sukhothai	Kamphaeng Phet	Tak	Total	(%)
Socio-Economic Structure	133,484,200	72,627,499	69,021,797	67,331,570	342,467,066	(43.39)
Production	3,364,386	5,265,520	1,386,560	1,598,900	11,615,366	(1.47)
Public Health	20,000	-	23,000	-	43,000	(0.01)
Water Supply	36,351,608	319,833,745	50,938,476	21,533,136	428,656,965	(54.31)
Knowledge	1,346,780	1,008,610	1,544,420	2,537,080	6,436,890	(0.82)
Total	174,542,054 (22.11)	398,735,333 (50.53)	122,914,435 (15.58)	93,000,686 (11.78)	789,192,508 (100.00)	

Note: The figures in parenthesis are percentage

TABLE G-1-9 Detial of Rural Development Budget for Ministry of Interior in Fiscal-year 1991, Changwat Phitsanulok

Project Handle by	Socio-Economic Structure	Production	Public Health	Water Supply	Knowledge	Total	
						Amount	Percent
The Local Administration Department	1,465,775	120,000	-	3,061,608	324,000	4,971,383	2.85
The Office of Accelerated Rural Development	114,090,000	572,436	-	29,410,000	75,500	144,144,936	82.58
The Community Development Department	314,500	762,000	-	-	512,400	1,563,900	0.89
Department of Public Welfare	10,696,255	1,842,450	-	-	-	12,538,705	7.18
Department of Public Works	6,765,000	-	-	3,880,000	-	10,645,705	6.10
The Police Department	115,000	25,000	-	-	276,130	411,130	0.23
Department of Labour	-	62,500	-	-	-	62,500	0.35
Department of Public Prosecutions	-	-	-	-	176,500	176,500	0.10
Provincial Electricity Authority	-	-	-	-	-	-	-
Sports Organization of Thailand	-	-	20,000	-	-	20,000	0.01
Total	133,484,200	3,364,386	20,000	36,351,608	1,346,780	174,542,054	100.00

Source: Provincial Rural Development Plan in Fiscal Year 1991, Changwat Phitsanulok

TABLE G-1-10 Detial of Rural Development Budget for Ministry of Interior in Fiscal year 1991, Changwat Sukhothai

Project Handle by	Socio-Economic Structure	Production	Public Health	Water Supply	Knowledge	Total	
						Amount	Percent
The Local Administration Department	2,633,746	30,000	-	5,090,945	614,400	32,070,101	8.04
The Office of Accelerated Rural Development	29,972,212	4,498,120	-	305,146,800	-	339,617,132	85.17
The Community Development Department	314,500	367,400	-	-	254,700	936,600	0.23
Department of Public Welfare	-	-	-	-	-	25,972,000	6.51
Department of Public Works	16,006,000	370,000	-	9,596,000	-	-	-
The Police Department	-	-	-	-	-	-	-
Department of Labour	-	-	-	-	-	-	-
Department of Public Prosecutions	-	-	-	-	139,500	139,500	0.35
Provincial Electricity Authority	-	-	-	-	-	-	-
Sports Organization of Thailand	-	-	-	-	-	-	-
Total	72,627,499	5,265,520	-	319,833,745	1,008,610	398,735,333	100.00

Source: Provincial Rural Development Plan in Fiscal Year 1991, Changwat Sukhothai

TABLE G-1-11 Detial of Rural Development Budget for Ministry of Interior in Fiscal-year 1991, Changwat Kamphaeng Phet

Project Handle by	Socio-Economic Structure	Production	Public Health	Water Supply	Knowledge	Total	
						Amount	Percent
The Local Administration Department	17,534,139	140,000	-	5,932,973	565,990	24,173,102	19.67
The Office of Accelerated Rural Development	37,988,665	377,160	-	39,671,503	161,000	78,198,328	63.62
The Community Development Department	358,500	762,000	-	-	434,900	1,555,410	1.26
Department of Public Welfare	3,170,675	-	-	-	-	3,170,675	2.58
Department of Public Works	9,890,000	-	-	5,334,000	-	15,224,000	12.38
The Police Department	80,000	-	-	-	211,530	291,530	0.24
Department of Labour	-	107,400	-	-	-	107,400	0.09
Department of Public Prosecutions	-	-	-	-	171,000	171,000	0.14
Provincial Electricity Authority	-	-	-	-	-	-	-
Sports Organization of Thailand	-	-	23,000	-	-	23,000	0.02
Total	69,021,979	1,386,560	23,000	50,938,476	1,544,420	122,914,435	100.00

Source: Provincial Rural Development Plan in Fiscal Year 1991, Changwat Kamphaneg Phet

TABLE G-1-12 Detial of Rural Development Budget for Ministry of Interior in Fiscal-year 1991, Changwat Tak

Project Handle by	Socio-Economic Structure	Production	Public Health	Water Supply	Knowledge	Total	
						Amount	Percent
The Local Administration Department	7,787,500	120,000	-	10,948,936	545,500	19,401,936	20.86
The Office of Accelerated Rural Development	55,601,800	756,700	-	6,786,200	770,660	63,915,360	68.72
The Community Development Department	311,000	614,000	-	-	345,500	1,270,500	1.37
Department of Public Welfare	-	-	-	-	-	-	-
Department of Public Works	3,040,000	-	-	3,798,000	-	6,838,000	7.35
The Police Department	469,250	-	-	-	741,520	1,210,770	1.30
Department of Labour	-	108,200	-	-	-	108,200	0.12
Department of Public Prosecutions	-	-	-	-	100,900	100,900	0.11
Provincial Electricity Authority	-	-	-	-	-	-	-
Sports Organization of Thailand	-	-	-	-	33,000	33,000	0.03
Land Department	122,020	-	-	-	-	122,020	0.14
Total	67,331,570	1,598,900	-	21,533,136	2,537,080	93,000,686	100.00

Source: Provincial Rural Development Plan in Fiscal Year 1991, Changwat Tak

TABLE G-1-13 Number of Population and Population Density by Amphoe, Changwat Phitsanulok, 1988

Amphoe	Number of Population	Area (sq.km)	Density/sq. km		
			1988	1984	Change
Muang Phitsanulok	229,687	758.80	302.70	279.85	+22.85
- Municipal area	77,675	18.26	4,253.83	4,070.70	+183.13
- Non-municipal area	152,012	740.54	205.27	186.37	+18.90
Bang Krathum	56,529	451.80	125.12	123.95	+1.17
Bang Rakam	92,785	992.00	93.54	90.18	+3.36
Chat Trakan	27,903	957.00	29.16	25.13	+4.03
Nakhon Thai	57,217	2,052.00	27.88	25.82	+2.06
Phrom Phiram	91,912	841.53	109.22	105.68	+3.54
Wang Thong	116,455	1,574.64	73.96	69.40	+4.56
Noen Maprang	60,067	733.00	81.95	77.63	+4.32
Wat Bot	34,791	1,340.32	25.96	24.26	+1.70
Total	767,350	9,701.09	79.10	74.47	+4.63

Source: Registration Division, Local Administration Department, Ministry of Interior.

TABLE G-1-14 Number of Population and Population Density by Amphoe, Changwat Sukhothai, 1988

Amphoe	Number of Population	Area (sq.km)	Density/sq. km		
			1988	1984	Change
Muang Sukhothai	111,797	657.16	170.12	168.68	+1.44
- Municipal area	22,853	3.05	7,492.78	7,540.33	-47.55
- Non-municipal area	88,944	654.11	135.98	134.31	+1.67
Ban Dan Lan Hoi	38,105	947.00	40.24	33.31	+6.93
Khiri Mat	48,869	497.10	98.31	92.91	+5.40
Kong Krailai	62,271	499.05	124.78	120.44	+4.34
Sawankhalok	89,858	793.59	113.23	110.66	+2.57
- Municipal area	20,743	3.41	6,082.99	5,891.79	+191.20
- Non-municipal area	69,115	790.18	87.47	85.71	+1.76
Si Nakhon	29,883	189.04	158.61	157.48	+1.13
Si Samrong	67,349	500.21	134.64	132.37	+2.27
Si Satchanalai	89,384	2,156.23	41.45	39.77	+1.68
Thung Saliam	45,233	168.84	267.90	248.60	+19.30
Total	582,849	6,408.22	90.95	87.42	+3.53

Source : Registration Division, Local Administration Department, Ministry of Interior.

TABLE G-1-15 Number of Population and Population Density by Amphoe, Changwat Kamphaeng Phet, 1988

Amphoe	Number of Population	Area (sq.km)	Density/sq. km		
			1988	1984	Change
Muang Kamphaeng Phet	207,545	3,367.86	61.62	58.91	+2.71
- Municipal area	24,053	14.90	1,614.30	1,510.74	+103.56
- Non-municipal area	183,542	3,352.96	54.74	52.46	+2.28
Khlong Lan	52,918	260.99	202.75	185.16	+17.59
Sai Ngam	46,668	620.00	75.27	71.01	+4.26
Khanu Woralaksaburi	123,216	2,100.00	58.67	56.85	+1.82
Khlong Khlung	113,830	2,650.51	42.95	47.00	-4.05
Phran Kratai	65,170	482.94	134.94	129.27	+5.67
Lan Krabu	34,366	720.00	47.73	43.96	+3.77
Total	643,763	10,202.30	63.10	61.63	+1.47

Source: Registration Division, Local Administration Department, Ministry of Interior.

TABLE G-1-16 Number of Population and Population Density by Amphoe,
Changwat : Tak , 1988

Amphoe	Number of Population	Area (sq.km)	Density/sq. km		
			1988	1984	Change
Muang Tak	103,962	2,058.14	50.51	46.00	+4.51
- Municipal area	20,911	7.72	2,708.67	2,754.40	-45.73
- Non-municipal area	83,051	2,050.42	40.50	35.80	+4.70
Ban Tak	43,633	1,059.78	41.17	39.12	+2.05
Mae Ramat	33,037	890.73	37.09	35.05	+2.04
Mae Sot	78,582	2,121.20	37.05	35.12	+1.93
- Municipal area	20,029	27.02	741.27	724.98	+16.29
- Non-municipal area	58,553	2,094.18	27.96	26.22	+1.74
Phop Phra	15,358	520.00	29.53	22.96	+6.57
Sam Ngao	31,961	2,960.46	10.79	10.19	+0.60
Tha Song Yang	17,482	2,051.00	8.52	8.13	+0.39
Umphang	12,699	4,619.85	2.75	2.24	+0.51
Total	336,714	16,281.16	20.68	19.15	+1.53

Source: Registration Division, Local Administration Department, Ministry of Interior.

TABLE G-1-17 Number of Houses in Municipal and Non-Municipal Areas, 1988

Changwat	Municipal	Non-Municipal	Total
Kamphaeng Phet	7,059 (6.0)	116,755 (94.0)	123,814 (100.0)
Tak	10,181 (15.0)	58,966 (85.0)	69,147 (100.0)
Phitsanulok	18,372 (12.0)	136,947 (88.0)	155,319 (100.0)
Sukhothai	9,025 (8.0)	109,927 (92.0)	118,952 (100.0)
Northern Region	189,557 (8.0)	2,084,208 (92.0)	2,273,765 (100.0)
Whole Kingdom	2,014,583 (19.0)	8,403,146 (81.0)	10,417,729 (100.0)

TABLE G-1-18 Number of Population in Municipality and Non-Municipality, 1988

Changwat	Municipality	Non-Municipality	Total
Kamphaeng Phet	24,053 (4.0)	619,710 (96.0)	643,763 (100.0)
Tak	20,911 (6.0)	315,803 (94.0)	336,714 (100.0)
Phitsanulok	77,675 (10.0)	689,675 (90.0)	767,350 (100.0)
Sukhothai	22,853 (4.0)	559,996 (96.0)	582,849 (100.0)
Northern Region	830,218 (8.0)	9,901,391 (92.0)	10,731,609 (100.0)
Whole Kingdom	9,949,377 (18.0)	45,011,540 (82.0)	54,960,917 (100.0)

TABLE G-1-19 Population density in the Project Area

Changwat	1984	1987	Change
Phitsanulok	66.80	69.90	+3.10
Municipal	4,070.70	4,274.86	+204.16
Non-Municipal	60.03	62.79	+2.76
Sukhothai	84.93	87.57	+2.64
Municipal	4,317.54	4,383.37	+65.83
Non-Municipal	78.52	81.06	+2.54
Kamphaeng Phet	73.05	73.78	+0.73
Municipal	1,510.74	1,591.34	+80.60
Non-Municipal	70.56	71.15	+0.59
Tak	19.00	20.12	+1.12
Municipal	1,185.18	1,186.92	+1.74
Non-Municipal	16.55	17.66	+1.11
Northern Region	60.60	62.40	+1.80
Municipal	2,960.00	3,041.13	+81.13
Non-Municipal	55.94	57.60	+1.66

Source: NSO

TABLE G-1-20 Average household annual income in Northern Region and Whole Kingdom, 1988

Source of Income	Northern Region	Whole Kingdom
Total Current Income	40,944	47,772
Money Income	29,268	35,160
Wages and Salary	11,232	16,428
Profit, Non-farm	5,868	7,392
Profit from farming	8,592	7,512
Property Income 1/	480	432
Current Transfers 2/	3,096	3,396
Non-Money Income	11,676	12,612
Other Money Reciepts	384	732
Total Income	41,328	48,504

Note: 1/ Including land rent, other rents, interests and dividends.

2/ Including assistance payment, pensions and annuities scholarships and grants, terminal pay.

Source: Economic and Social Indicators, NSO, 1990

TABLE G-1-21 Gini Ratio in the Northern region

Area	1975/76	1981	1986
Municipal Area	0.333	0.328	0.329
Sanitary Districts	0.299	0.327	0.362
Villages	0.278	0.314	0.329

Source: Economic and Social Indicators, NSO, 1990

TABLE G-1-22 Comparisons of some indicators in Northern Region and Whole Kingdom, 1980 and 1986

Indicator	Northern Region		Whole Kingdom	
	1980	1986	1980	1986
(a) Average Household Size (Person)	4.8	4.2	5.2	4.7
Municipal Area	4.6	4.0	5.0	4.6
Non-Municipal Area	4.8	4.2	5.3	4.7
(b) Lighting facility (%)*	37.9	72.3	43.0	73.5
Municipal Area	90.7	96.4	94.2	98.2
Non-Municipal Area	33.7	70.0	32.0	67.7
(c) Tap Water (%)	10.6	14.4	18.9	22.0
Municipal Area	69.7	74.0	74.3	83.0
Non-Municipal Area	5.9	8.9	7.1	8.2
(d) Sanitary Toilet facility (%)	59.2	77.6	54.6	67.2
Municipal Area	93.8	96.8	95.0	97.9
Non-Municipal Area	56.5	75.9	45.9	60.2
(e) Radio (%)	94.7	75.9	95.0	75.8
Municipal Area	90.8	80.1	93.2	82.6
Non-Municipal Area	95.0	75.5	95.4	74.2
(f) Television (%)	13.7	42.5	23.4	45.7
Municipal Area	54.2	80.5	71.1	84.0
Non-Municipal Area	10.3	47.5	12.6	47.5
(g) Bicycle (%)	61.9	61.8	49.0	50.9
Municipal Area	59.3	53.7	32.8	33.1
Non-Municipal Area	62.1	62.5	52.6	55.0
(h) Morter-Cycle (%)	24.6	34.3	20.4	26.8
Municipal Area	45.9	53.1	23.3	28.0
Non-Municipal Area	22.8	32.5	19.8	26.5

Note: * Percentage of Private Household

Source: Economic and Social Indicator, NSO, 1990

TABLE G-1-23 Number of Mortor Vechicle Registration Under Mortor Vechicle Act by Changwat; Fiscal Year 1988

Changwat	Total	Passenger Cars	Personal Van and Trucks	Taxis and Service cars	Mortercycles	Tractors	Agricultural Cars	Other
Kampheang Phet	37,907	1,709	6,390	14	26,095	985	2,696	18
Tak	29,974	2,036	4,516	-	23,033	389	-	-
Phitsanulok	96,419	5,077	10,852	368	57,262	1,100	4,938	16,822
Sukhothai	40,778	1,343	4,230	35	31,659	905	2,590	16
Northern Region	1,250,072	76,489	159,778	5,640	920,259	15,795	24,375	47,736
Whole Kingdom	6,045,474	1,146,512	723,882	65,399	3,894,824	80,44	59,706	74,702

Source: Statistical Year Book Number 36, 1988

TABLE G-2-1(1) IMPORT PARITY PRICE, 46% OF N

Cost Item	FY 2000 Projected Price		
	Financial (฿/ton)	Conversion Factor	Economic (฿/ton)
Import Price, any origin, bagged, F.O.B. N.W Europe *1	US$ 193	n.r.	US$ 193
Ocean Freight and Insurance to Bangkok Part	+ 35	n.r.	35
Import Price, CIF Bangkok	= 228	n.r.	228
Import Tax (3% on Import Price)	+ 7	0.00	0
Baht Equivalent *2	Baht5,993	n.r.	5,814
Port Charge	+ 30	0.80	24
Administrative and Storage Costs	+ 42	0.80	34
Importer's/ Wholesaler's Margin *3	+ 599	0.64	383
Transport Cost, Bangkok to the Project Area *4	+ 354	0.80	283
Input Price at dealer's store	= 7,018	n.r.	6,538
Margin of Commodity Dealer *5	+ 351	0.64	225
Transport and Handling Costs from Dealer to Farmgate *6	+ 85	0.80	68
Farmgate Price	= 7,454	n.r.	6,831
Farmgate Price, Nutrient Basis	= 16,204	n.r.	14,850

*1 Based on World Bank's Commodity Price Projection Dec. 1990
*2 US$ 1.0 = ฿ 25.50
*3 Approximately 10% of Import Price with Tax
*4 Based on 377 km Bangkok to Phitsanulok at 0.90 Baht/ mt/km and two Handling Charges of 7.5Baht/mt
*5 Approximately 5% of Input Price at Dealer's Store
*6 Based on an Average Distance of 20km at 3.5Baht/mt/km and two Handling Charges of 7.5Baht/mt

TABLE G-2-1 (2) IMPORT PARITY PRICE, 45% OF P_2O_5

Cost Item	FY 2000 Projected Price		
	Financial (฿/ton)	Conversion Factor	Economic (฿/ton)
Import Price, any,Bulk, F.O.B. US.GULF *1	US$ 185	n.r.	US$ 185
Ocean Freight and Insurance to Bangkok Part	+ 35	n.r.	+ 35
Import Price, CIF Bangkok	= 220	n.r.	220
Import Tax (3% on Import Price)	+ 7	n.r.	0
Baht Equivalent *2	Baht 5,814	n.r.	5,610
Port Charge	+ 30	0.80	24
Administrative and Storage Costs	+ 42	0.80	34
Importer's/ Wholesaler's Margin *3	+ 581	0.64	372
Transport Cost, Bangkok to the Project Area *4	+ 354	0.80	283
Input Price at dealer's store	= 6,821	n.r.	6,323
Margin of Commodity Dealer *5	+ 341	0.64	218
Transport and Handling Costs from Dealer to Farmgate *6	+ 85	0.80	68
Farmgate Price	= 7,247	n.r.	6,609
Farmgate Price, Nutrient basis	= 16,104	n.r.	14,687

*1 Based on World Bank's Commodity Price Projection Dec. 1990

*2 US$ 1.0 = ฿ 25.50

*3 Approximately 10% of Import Price with Tax

*4 Based on 377 km Bangkok to Phitsanulok at 0.90 Baht/ mt/km and two Handling Charges of 7.5Baht/mt

*5 Approximately 5% of Input Price at Dealer's Store

*6 Based on an Average Distance of 20km at 3.5Baht/mt/km and two Handling Charges of 7.5Baht/mt

TABLE G- 2 - 1 (3) IMPORT PARITY PRICE, 60% OF K_2O

Cost Item	FY 2000 Projected Price		
	Financial (฿/ton)	Conversion Factor	Economic (฿/ton)
Import Price, Bulk, F.O.B. Vancouver *1	US$ 116	n.r.	US$ 116
Ocean Freight and Insurance to Bangkok Part	+ 35	n.r.	35
Import Price, CIF Bangkok	= 151	n.r.	151
Import Tax (3% on Import Price)	+ 5	n.r.	0
Baht Equivalent *2	Baht 3,978	n.r.	3,851
Port Charge	+ 30	0.80	24
Administrative and Storage Costs	+ 42	0.80	34
Importer's/ Wholesaler's Margin *3	+ 398	0.64	255
Transport Cost, Bangkok to the Project Area *4	+ 354	0.80	283
Input Price at dealer's store	= 4,802	n.r.	4,447
Margin of Commodity Dealer *5	+ 240	0.64	154
Transport and Handling Costs from Dealer to Farmgate *6	+ 85	0.80	68
Farmgate Price	= 5,127	n.r.	4,669
Farmgate Price, Nutrient basis	= 8,545	n.r.	7,782

*1 Based on World Bank's Commodity Price Projection Dec. 1990
*2 US$ 1.0 = ฿ 25.50
*3 Approximately 10% of Import Price with Tax
*4 Based on 377 km Bangkok to Phitsanulok at 0.90 Baht/ mt/km and two Handling Charges of 7.5Baht/mt
*5 Approximately 5% of Input Price at Dealer's Store
*6 Based on an Average Distance of 20km at 3.5Baht/mt/km and two Handling Charges of 7.5Baht/mt

TABLE G-2-2 (1) FARM MACHINERY COST, 2-WHEEL HAND TRACTOR

Cost Item	Financial (฿/hour)	Conversion Factor	Economic (฿/hour)
Depreciation *1	4.22	0.64	2.70
Interest *2	2.25	0.00	0.00
Spare Parts & Repairs *3	2.81	0.92	2.59
Fuel *4	8.20	1.00	8.20
Lubricants *5	0.82	1.00	0.82
Insurance	-	-	-
Operator	-	-	-
Operating Cost, Sub Total	18.30	0.78	14.31
Other Miscellaneous (operating cost×5%)	0.92	0.92	0.85
Total	19.22	0.79	15.16

Basis of Calculation			Calculation
Ⓐ Purchase Price (Financial)	:	37,500฿	*1 (37,500 - 3,750) / 8,000
Ⓑ *Durable Life*	:	*8 years or 8,000 hours*	*2 *0.12 × (0.5×37,500) / 1,000*
Ⓒ Residual Value	:	10% of Purchase Price	*3 0.6×37,500 / 8,000
Ⓓ Interest on Investment	:	12% per annum	*4 8×0.125×@8.20
Ⓔ Cost of Spare Parts and Repairs	:	60% of Total Investment	*5 8.20×0.1
Ⓕ Fuel Consumption at Full Load	:	0.125 liter/hour/HP	
Ⓓ Diesel Cost	:	8.20 ฿/liter	
Ⓗ Cost of Lubricants and Filters	:	10% of Diesel Cost	
Ⓘ Average Annual Working Hours	:	1,000 hours	
Ⓙ Operator's Cost	:	None	

TALBE G-2-2 (2) FARM MACHINERY COST, 4-WHEEL MEDIUM SIZE TRACTOR

Cost Item	Financial (฿/hour)	Conversion Factor	Economic (฿/hour)
Depreciation *1	61.88	0.64	39.60
Interest *2	33.00	0.00	0.00
Spare Parts & Repairs *3	55.00	0.92	50.60
Fuel *4	24.60	1.00	24.60
Lubricants *5	2.46	1.00	2.46
Insurance *6	8.25	1.00	8.25
Operator	20.00	0.64	12.80
Operating Cost, Sub Total	205.19	0.67	138.31
Other Miscellaneous (operating cost×5%)	10.26	0.92	9.44
Contractor's Profit	102.60	0.64	65.66
Total	318.05	0.67	213.41

Basis of Calculation			Calculation
Ⓐ Purchase Price (Financial)	:	550,000฿	*1 (550,000 - 55,000) / 8,000
Ⓑ Durable Life	:	8 years or 8,000 hours	*2 0.12 × (0.5×550,000)/1,000
Ⓒ Residual Value	:	10% of Purchase Price	*3 0.8×550,000 / 8,000
Ⓓ Interest on Investment	:	12% per annum	*4 30×0.1×@ 8.20
Ⓔ Cost of Spare Parts and Repairs	:	80% of Total Investment	*5 24.6×0.1
Ⓕ Fuel Consumption at Full Load	:	0.1 liter/hour/HP	*6 550,000×0.015 / 1,000
Ⓓ Diesel Cost	:	8.20 ฿/liter	
Ⓗ Cost of Lubricants and Filters	:	10% of Diesel Cost	
Ⓘ Average Annual Working Hours	:	1,000 hours	
Ⓙ Annual Insurance	:	1.5 %	
Ⓚ Operator's Cost	:	20฿/hour	

TABLE G-2-2 (3) FARM MACHINERY COST, LOW-LIFT PUMP

Cost Item	Financial (฿/hour)	Conversion Factor	Economic (฿/hour)
Depreciation * 1	2.93	0.64	1.88
Interest * 2	1.56	0.00	0.00
Spare Parts & Repairs * 3	1.79	0.92	1.65
Fuel * 4	8.20	1.00	8.20
Lubricants * 5	0.82	1.00	0.82
Insurance	-	-	-
Operator	-	-	-
Operating Cost, Sub Total	15.30	0.82	12.55
Other Miscellaneous (operating cost×5%)	0.77	0.92	0.71
Total	16.07	0.83	13.26

Basis of Calculation			Calculation
Ⓐ Purchase Price (Financial)	:	26,000฿	* 1 (26,000 - 2,600) / 8,000
Ⓑ Durable Life	:	8 years or 8,000 hours	* 2 0.12 × (0.5×26,000)/1,000
Ⓒ Residual Value	:	5% of Purchase Price	* 3 (0.55×26,000) / 8,000
Ⓓ Interest on Investment	:	12% per annum	* 4 8×0.125×@ 8.20
Ⓔ Cost of Spare Parts and Repairs	:	55% of Total Investment	* 5 8.20×0.1
Ⓕ Fuel Consumption at Full Load	:	0.125 liter/hour/HP	
Ⓓ Diesel Cost	:	8.20 ฿/liter	
Ⓗ Cost of Lubricants and Filters	:	10% of Diesel Cost	
Ⓘ Average Annual Working Hours	:	1,000 hours	
Ⓙ Operator's Cost	:	None (opented by farmer)	

TALBE G-2-2 (4) FARM MACHINERY COST, THRESHER W/ENGINE

Cost Item	Financial (฿/hour)	Conversion Factor	Economic (฿/hour)
Depreciation * 1	28.50	0.64	18.24
Interest * 2	14.40	0.00	0.00
Spare Parts & Repairs * 3	30.00	0.92	276.0
Fuel * 4	10.25	1.00	10.25
Lubricants * 5	1.03	1.00	1.03
Insurance	-	-	-
Operator	20.00	0.64	12.80
Operating Cost, Sub Total	104.18	49.9	69.92
Other Miscellaneous (operating cost×5%)	5.21	0.92	4.79
Contractor's Profit	52.09	0.64	33.34
Total	161.48	66.9	108.05

Basis of Calculation		
Ⓐ Purchase Price (Financial)	:	120,000฿
Ⓑ Durable Life	:	8 years or 4,000 hours
Ⓒ Residual Value	:	5% of Purchase Price
Ⓓ Interest on Investment	:	12% per annum
Ⓔ Cost of Spare Parts and Repairs:		100% of Total Investment
Ⓕ Fuel Consumption at Full Load	:	0.125 liter/hour/HP
Ⓓ Diesel Cost	:	8.20 ฿/liter
Ⓗ Cost of Lubricants and Filters	:	10% of Diesel Cost
Ⓘ Average Annual Working Hours	:	500 hours
Ⓙ Operator's	:	2 assistants 20 ฿/hour

Calculation
* 1 (120,000 - 6,000) / 4,000
* 2 0.12 × (0.5×120,000) /500
* 3 (1.0×120,000) / 4,000
* 4 10×0.125×@ 8.20
* 5 10.25×0.1

TABLE G-2-3 (1) EXPORT PARITY PRICE, PADDY

Cost Item	FY 2000 Projected Price		
	Financial (฿/ton)	Conversion Factor	Economic (฿/ton)
Export Thai, White, Milled, 5% Broken , FOB Bangkok *1	US$ 305	n.r.	US$ 305
Baht Equivalent*2	Baht 7,778	n.r.	Baht 7,778
Port Charge	- 200	0.80	160
Business & Municipal Tax *3	- 210	0.00	0
Exporter's Margin *4	- 311	0.64	199
Wholeasaler's Margin *5	- 233	0.64	149
Transportation& Handling Charge *6	- 354	0.80	283
Ex-mill Price of Rice	= 6,470	n.r.	6,987
Yield of White Rice (%) *7	% 66	n.r.	66
Ex-mill Price of Paddy	= 4,270	n.r.	4,611
Milling Tax *8	- 95	0.00	0
Milling Cost Plus Miller's Margin *9	- 236	0.64	151
Input Price of Paddy at Mill	= 3,939	n.r.	4,460
Middleman's Margin *10	- 158	0.64	101
Transport cost, Farm to Mill *11	- 85	0.80	68
Formgate Price of Paddy	= 3,696	n.r.	4,291

*1 Based on World Bank's Commodity Price Projection, Dec, 1990

*2 US$ 1.0 = ฿ 25.50

*3 Approximately 2.7% of F.O.B. Price

*4 Approximately 4% of F.O.B. Price

*5 Approximately 3% of F.O.B. Price

*6 Based on an 377km from Phitsanulok to Bangkok at 0.90 Baht/mt/km and two handling charges of 7.5Baht/mt.

*7 weighted Processing Ration of 90 % Private Mill (66%) and 10 % Public Big Mill (67%)

*8 Approximately 2.4% of Input Price of Paddy at Mill

*9 Approximately 6% of Input Price of Paddy at Mill

*10 Approximately 4% of Input Price of Paddy at Mill

*11 Based on average distance of 20km of 3.5Baht/mt/km and two handling charges of 7.5 Baht/ mt.

TABLE G-2-3 (2) EXPORT PARITY PRICE, (2) MAIZE

Cost Item	FY 2000 Projected Price		
	Financial (฿/ton)	Conversion Factor	Economic (฿/ton)
Maize (US), No.2, Yellow, FOB GULF Port *1	US$ 128	n.r.	128
Baht Equivalent *2	Baht 3,264	n.r.	3.264
Part Charge	- 200	0.80	160
Business & Municipal Tax *3	- 88	0.00	0
Exporter's Margin *4	- 131	0.64	84
Whloesaler's Margin *5	- 98	0.64	63
Transportation & Handling Charge *6	- 354	0.80	283
Input Price of maize at Middlemans' Storage	= 2,393	n.r.	2,674
Middleman's Margin *7	- 96	0.64	61
Transport Cost, Form to Middleman's Storage *8	- 85	0.80	68
Farmgate Price of Maize	= 2,212	n.r.	2,545

*1 Based on World Bank's Commodity Price Projection, Dec, 1990
*2 US$ 1.0 = ฿ 25.50
*3 Approximately 2.7% of F.O.B. Price
*4 Approximately 4% of F.O.B. Price
*5 Approximately 3% of F.O.B. Price
*6 Based on 377 km from Phitsanulok to Bangkok at 0.90 Baht/mt and two handling charges of 7.5 Baht/mt.
*7 Approximately 4% of Input price of Maize of middleman's Storage
*8 Based on average distance of 20km at 3.5 Baht/mt/km and two handling charges of 7.5 Baht/mt.

TABLE G-2-3 (3) EXPORT PARITY PRICE, (3) SOYBEAN

Cost Item	FY 2000 Projected Price		
	Financial (฿/ton)	Conversion Factor	Economic (฿/ton)
Soybeans (US), CIF Rotlerdom *1	US$ 241	n.r.	241
Projected Price , CIF Bangkok	US$ 301	n.r.	301
Baht Equivalent *2	Baht 7,676	n.r.	7,676
Port Charge	+ 200	0.80	160
Business & Municipal Tax *3	+ 207	0.00	0
Transport to Oil Mill	+ 150	0.80	120
Importer's Margin *4	+ 307	0.64	196
Wholesale Price in Bangkok	= 8,540	n.r.	8,152
Quality Adjustment	= 7,686	n.r.	7,337
Transoprtation & Handling Charge to Bangkok *5	- 354	0.80	283
Marketing Costs	- 500	0.80	400
Middleman's Margin *6	- 307	0.64	196
Farmgate Price of Soybeans	= 6,525	n.r.	6,458

*1 Based on World Bank's Commodity Price Projection, Dec, 1990
*2 US$ 1.0 = ฿ 25.50
*3 Approximately 2.7% of C.I.F.Price
*4 Approximately 4% of F.C.I.F.Price
*5 based on 377km from Bangkok to Phitanulok at 0.90 Baht/mt/km and two handling changes of 7.5baht/mt
*6 Approximately 4% of Wholesale Price in Bangkok

TABLE G-2-4 FINANCIAL AND ECONOMIC PRICES OF LOCALLY TRADED FARM OUTPUTS

(Baht/kg)

Farm Output	Financial Price (1991)	Conversion Factor	Economic Price (1991)
Groundnuts	8.20	*1 1.09	8.94
Sugarcane	0.33	*1 1.09	0.36
Cassava	0.65	*1 1.09	0.71
Tomato	2.00	*2 0.92	1.84
Mango	7.38	*1 1.09	8.04
Bamboo	5.98	*2 0.92	5.50
Upland Rice	2.90	*1 1.09	3.16
Sesame	20.50	*2 0.92	18.86
Mulberry	70.00	*3 1.05	73.29
Feedgrass	0.35	*2 0.92	0.32

*1 Conversion factors for exportable but locally-traded form outputs are assumed at 1.09.
*2 Conversion factors for not-exportable and locally-traded farm outputs are assumed at 0.92.
*3 Refer to Table G-2-7.

TABLE G-2-5 CONVERSION FACTOR FOR COCOON

Farm Output	Financial (฿/ton)	Conversion Factor	Economic (฿/ton)
Input Price of Cocoon to Silk Factory in Khon Khen	80,870	-	80,870
Transport and Handling Costs from Middleman to Silk Factory *1	3,020	0.80	2,416
Middleman's Margin *2	7,000	0.64	4,480
Transport and Handing Costs from Farmer to Middleman *3	850	0.80	680
Farmgate Price of Cocoon	70,000	1.05	73,294

*1 Based on 319 km from Phitsahulok to Khon Khen at 9.0 Baht/mt/km and Two Handling Charges of 75 Baht/mt
*2 Approximately 10% of Farmgate Price of Cocoon
*3 Based on Avarage Distance of 20km at 35.0 Baht/mt/km and two handling charges of 75 Baht/mt

Convension Factor 73,294/70,000 = 1.052

TABLE G-2-6 (1) FINANCIAL PRODUCTION COST, PADDY (EXISTING)

(Unit ; Per ha)

Item	Unit of Quantity	Quantity	Unit Price (Baht)	Production Cost (Baht)
① Seed	kg	75	4.0	300.0
N (Nutrient Basis)	kg	29	16.2	469.8
P (Nutrient Basis)	kg	25	16.1	402.5
K (Nutrient Basis)	kg	-	8.5	-
② Fertilizer	n.r	n.r.	n.r.	872.3
Fungicide	time	-	130.0	-
Pesticide	time	1	165.0	165.0
Herbicide	time	1	206.0	206.0
③ Chemicals	n.r.	n.r.	n.r.	371.0
Hand Tractor	hour	50	19.2	960.0
Medium-Size Tractor	hour	-	618.1	-
Low-lift Pump	hour	42	16.1	676.2
Thresher	hour	1	161.5	161.5
④ Machinery	n.r.	n.r.	n.r.	1,797.7
Land Preparation	man/day	78	45.0	3510.0
Planting	man/day			
Weeding	man/day			
Fertilizer Application	man/day			
Chemical Application	man/day			
Irrigation	man/day			
Harvesting	man/day			
Post-harvesting	man/day			
Transportation	man/day			
⑤ Farm Labour	man/day			
G. Total	n.r.	n.r.	n.r.	6851.0

TABLE G-2-6 (2) ECONOMIC PRODUCTION COST, PADDY (EXISTING)

(Unit ; Per ha)

Item	Unit of Quantity	Quantity	Unit Price (Baht)	Production Cost (Baht)
① Seed	kg	75	3.4	255.0
N (Nutrient Basis)	kg	29	14.9	432.1
P (Nutrient Basis)	kg	25	14.7	367.5
K (Nutrient Basis)	kg	-	7.8	-
② Fertilizer	n.r.	n.r.	n.r.	799.6
Fungicide	time	-	119.6	-
Pesticide	time	1	151.8	151.8
Herbicide	time	1	189.5	189.5
③ Chemicals	n.r.	n.r.	n.r.	341.3
Hand Tractor	hour	50	15.2	760.0
Medium-Size Tractor	hour	-	213.4	-
Low-lift Pump	hour	42	13.3	558.6
Thresher	hour	1	108.1	108.1
④ Machinery	n.r.	n.r.	n.r.	1,426.7
Land Preparation	man/day	78	41.4	3,229.2
Planting	man/day			
Weeding	man/day			
Fertilizer Application	man/day			
Chemical Application	man/day			
Irrigation	man/day			
Harvesting	man/day			
Post-harvesting	man/day			
Transportation	man/day			
⑤ Farm Labour	man/day			
G. Total	n.r.	n.r.	n.r.	6,051.8

TABLE G-2-6 (3) FINANCIAL PRODUCTION COST, PADDY (PLANNED)

(Unit ; Per ha)

Item	Unit of Quantity	Quantity	Unit Price (Baht)	Production Cost (Baht)
① Seed	kg	75	4.0	300.0
N (Nutrient Basis)	kg	48	16.2	777.6
P (Nutrient Basis)	kg	50	16.1	805.0
K (Nutrient Basis)	kg	25	8.5	212.5
② Fertilizer	n.r.	n.r.	n.r.	1,795.1
Fungicide	time	2	130.0	260.0
Pesticide	time	1	165.0	165.0
Herbicide	time	1	206.0	206.0
③ Chemicals	n.r.	n.r.	n.r.	631.0
Hand Tractor	hour	20	19.2	384.0
Medium-Size Tractor	hour	3	318.1	954.3
Low-lift Pump	hour	62	16.1	998.2
Thresher	hour	1	161.5	161.5
④ Machinery	n.r.	n.r.	n.r.	2,498.0
Land Preparation	man/day	94	45.0	4,230.0
Planting	man/day			
Weeding	man/day			
Fertilizer Application	man/day			
Chemical Application	man/day			
Irrigation	man/day			
Harvesting	man/day			
Post-harvesting	man/day			
Transportation	man/day			
⑤ Farm Labour	man/day			
G. Total	n.r.	n.r.	n.r.	9,454.1

TALBE G-2-6 (4) ECONOMIC PRODUCTION COST, PADDY (PLANNED)

(Unit ; Per ha)

Item	Unit of Quantity	Quantity	Unit Price (Baht)	Production Cost (Baht)
① Seed	kg	75	3.4	255.0
N (Nutrient Basis)	kg	48	14.9	715.2
P (Nutrient Basis)	kg	50	14.7	735.0
K (Nutrient Basis)	kg	25	7.8	195.0
② Fertilizer	n.r.	n.r.	n.r.	1,645.2
Fungicide	time	2	119.6	239.2
Pesticide	time	1	151.8	151.8
Herbicide	time	1	189.5	189.5
③ Chemicals	n.r.	n.r.	n.r.	580.5
Hand Tractor	hour	20	15.2	304.0
Medium-Size Tractor	hour	3	213.4	640.2
Low-lift Pump	hour	62	13.3	824.6
Thresher	hour	1	108.1	108.1
④ Machinery	n.r.	n.r.	n.r.	1,876.9
Land Preparation	man/day	94	41.4	3,891.6
Planting	man/day			
Weeding	man/day			
Fertilizer Application	man/day			
Chemical Application	man/day			
Irrigation	man/day			
Harvesting	man/day			
Post-harvesting	man/day			
Transportation				
⑤ Farm Labour	man/day			
G. Total	n.r.	n.r.	n.r.	8,249.2

TABLE G-2-7 (1) FINANCIAL PRODUCTION COST, MAIZE (EXISTING)

(Unit ; Per ha)

Item	Unit of Quantity	Quantity	Unit Price (Baht)	Production Cost (Baht)
① Seed	kg	20	3.0	60.0
N (Nutrient Basis)	kg	17	16.2	275.4
P (Nutrient Basis)	kg	15	16.1	241.5
K (Nutrient Basis)	kg	-	8.5	-
② Fertilizer	n.r.	n.r.	n.r.	516.9
Fungicide	time	-	130.0	-
Pesticide	time	-	165.0	-
Herbicide	time	-	206.0	-
③ Chemicals	n.r.	n.r.	n.r.	-
Hand Tractor	hour	25	19.2	480.0
Medium-Size Tractor	hour	-	318.1	-
Low-lift Pump	hour	21	16.1	338.1
Thresher	hour	-	161.5	-
④ Machinery	n.r.	n.r.	n.r.	818.1
Land Preparation	man/day	45	45.0	2,025.0
Planting	man/day			
Weeding	man/day			
Fertilizer Application	man/day			
Chemical Application	man/day			
Irrigation	man/day			
Harvesting	man/da			
Post-harvesting	man/day			
Transpcrtation	man/day			
⑤ Farm Labour	man/day			
G. Total	n.r.	n.r.	n.r.	3,419.1

TABLE G-2-7 (2) ECONOMIC PRODUCTION COST, MAIZE (EXISTING)

(Unit ; Per ha)

Item	Unit of Quantity	Quantity	Unit Price (Baht)	Production Cost (Baht)
① Seed	kg	20	2.6	52.0
N (Nutrient Basis)	kg	17	14.9	253.3
P (Nutrient Basis)	kg	15	14.7	220.5
K (Nutrient Basis)	kg	-	7.8	-
② Fertilizer	n.r.	n.r.	n.r.	473.8
Fungicide	time	-	119.6	-
Pesticide	time	-	151.8	-
Herbicide	time	-	189.5	-
③ Chemicals	n.r.	n.r.	n.r.	-
Hand Tractor	hour	25	15.2	380.0
Medium-Size Tractor	hour	-	213.4	-
Low-lift Pump	hour	21	13.3	279.3
Thresher	hour	-	108.1	-
④ Machinery	n.r.	n.r.	n.r.	659.3
Land Preparation	man/day	45	41.4	1,863.0
Planting	man/day			
Weeding	man/day			
Fertilizer Application	man/day			
Chemical Application	man/day			
Irrigation	man/day			
Harvesting	man/day			
Post-harvesting	man/day			
Transportation	man/day			
⑤ Farm Labour	man/day			
G. Total	n.r.	n.r.	n.r.	3,048.1

TABLE G-2-7 (3) FINANCIAL PRODUCTION COST, MAIZE (PLANNED)

(Unit ; Per ha)

Item	Unit of Quantity	Quantity	Unit Price (Baht)	Production Cost (Baht)
① Seed	kg	25	3.0	75.0
N (Nutrient Basis)	kg	29	16.2	464.0
P (Nutrient Basis)	kg	30	16.1	483.0
K (Nutrient Basis)	kg	15	8.5	127.5
② Fertilizer	n.r.	n.r.	n.r.	1,074.5
Fungicide	time	-	130.0	-
Pesticide	time	-	165.0	-
Herbicide	time	-	206.0	-
③ Chemicals	n.r.	n.r.	n.r.	-
Hand Tractor	hour	25	19.2	480.0
Medium-Size Tractor	hour	-	318.1	-
Low-lift Pump	hour	21	16.1	338.1
Thresher	hour	-	161.5	-
④ Machinery	n.r.	n.r.	n.r.	818.1
Land Preparation	man/day	54	45.0	2,430.0
Planting	man/day			
Weeding	man/day			
Fertilizer Application	man/day			
Chemical Application	man/day			
Irrigation	man/day			
Harvesting	man/day			
Post-harvesting	man/day			
Transportation	man/day			
⑤ Farm Labour	man/day			
G. Total	n.r.	n.r.	n.r.	4,397.6

TABLE G-2-7 (4) ECONOMIC PRODUCTION COST, MAIZE (PLANNED)

(Unit ; Per ha)

Item	Unit of Quantity	Quantity	Unit Price (Baht)	Production Cost (Baht)
① Seed	kg	25	2.6	65.0
N (Nutrient Basis)	kg	29	14.9	432.1
P (Nutrient Basis)	kg	30	14.7	441.0
K (Nutrient Basis)	kg	15	7.8	117.0
② Fertilizer	n.r.	n.r.	n.r.	990.1
Fungicide	time	-	119.6	-
Pesticide	time	-	151.8	-
Herbicide	time	-	189.5	-
③ Chemicals	n.r.	n.r.	n.r.	-
Hand Tractor	hour	25	15.2	380.0
Medium-Size Tractor	hour	-	213.4	-
Low-lift Pump	hour	21	13.3	279.3
Thresher	hour	-	108.1	-
④ Machinery	n.r.	n.r.	n.r.	659.3
Land Preparation	man/day	54	41.4	2,235.6
Planting	man/day			
Weeding	man/day			
Fertilizer Application	man/day			
Chemical Application	man/day			
Irrigation	man/day			
Harvesting	man/day			
Post-harvesting	man/day			
Transportation	man/day			
⑤ Farm Labour	man/day			
G. Total	n.r.	n.r.	n.r.	3,950.0

TABLE G-2-8 (1) FINANCIAL PRODUCTION COST, SOYBEAN (EXISTING)

(Unit ; Per ha)

Item	Unit of Quantity	Quantity	Unit Price (Baht)	Production Cost (Baht)
① Seed	kg	50	7.0	350.0
N (Nutrient Basis)	kg	24	16.2	388.8
P (Nutrient Basis)	kg	30	16.1	483.0
R (Nutrient Basis)	kg	10	8.5	85.0
② Fertilizer	n.r.	n.r.	n.r.	956.8
Fungicide	time	1	130.0	130.0
Pesticide	time	2	165.0	330.0
Herbicide	time	1	206.0	206.0
③ Chemicals	n.r.	n.r.	n.r.	666.0
Hand Tractor	hour	43	19.2	825.6
Medium-Size Tractor	hour	-	318.1	-
Low-lift Pump	hour	63	16.1	1,014.3
Thresher	hour	1	161.5	161.5
④ Machinery	n.r.	n.r.	n.r.	2,001.4
Land Preparation	man/day	40	45.0	1,800.0
Planting	man/day			
Weeding	man/day			
Fertilizer Application	man/day			
Chemical Application	man/day			
Irrigation	man/day			
Harvesting	man/day			
Post-harvesting	man/day			
Transportation	man/day			
⑤ Farm Labour	man/day			
G. Total	n.r.	n.r.	n.r.	5,774.2

TABLE G-2-8 (2) ECONOMIC PRODUCTION COST, SOYBEAN (EXISTING)

(Unit : Per ha)

Item	Unit of Quantity	Quantity	Unit Price (Baht)	Production Cost (Baht)
① Seed	kg	50	6.0	300.0
N (Nutrient Basis)	kg	24	14.9	357.6
P (Nutrient Basis)	kg	30	14.7	441.0
K (Nutrient Basis)	kg	10	7.8	78.0
② Fertilizer	n.r.	n.r.	n.r.	876.6
Fungicide	time	1	119.6	119.6
Pesticide	time	2	151.8	303.6
Herbicide	time	1	189.5	189.5
③ Chemicals	n.r.	n.r.	n.r.	612.7
Hand Tractor	hour	43	15.2	653.6
Medium-Size Tractor	hour	-	213.4	-
Low-lift Pump	hour	63	13.3	837.9
Thresher	hour	1	108.1	108.1
④ Machinery	n.r.	n.r.	n.r.	1,599.6
Land Preparation	man/day	40	41.4	1,656.0
Planting	man/day			
Weeding	man/day			
Fertilizer Application	man/day			
Chemical Application	man/day			
Irrigation	man/day			
Harvesting	man/day			
Post-harvesting	man/day			
Transportation	man/day			
⑤ Farm Labour	man/day			
G. Total	n.r.	n.r.	n.r.	5,044.9

TABLE G-2-8 (3) FINANCIAL PRODUCTION COST, SOYBEAN (PLANNED)

(Unit : Per ha)

Item	Unit of Quantity	Quantity	Unit Price (Baht)	Production Cost (Baht)
① Seed	kg	50	7.0	350.0
N (Nutrient Basis)	kg	29	16.2	469.8
P (Nutrient Basis)	kg	36	16.1	579.6
K (Nutrient Basis)	kg	12	8.5	102.0
② Fertilizer	n.r.	n.r.	n.r.	1,151.4
Fungicide	time	2	130.0	260.0
Pesticide	time	2	165.0	330.0
Herbicide	time	1	206.0	206.0
③ Chemicals	n.r.	n.r.	n.r.	796.0
Hand Tractor	hour	20	19.2	384.0
Medium-Size Tractor	hour	3	318.1	954.3
Low-lift Pump	hour	32	16.1	515.2
Thresher	hour	1	161.5	161.5
④ Machinery	n.r.	n.r.	n.r.	2,015.0
Land Preparation	man/day	48	45.0	2,160.0
Planting	man/day			
Weeding	man/day			
Fertilizer Application	man/day			
Chemical Application	man/day			
Irrigation	man/day			
Harvesting	man/day			
Post-harvesting	man/day			
Transportation	man/day			
⑤ Farm Labour	man/day			
G. Total	n.r.	n.r.	n.r.	6,472.4

TABLE G-2-8 (4) ECONOMIC PRODUCTION COST, SOYBEAN (PLANNED)

(Unit : Per ha)

Item	Unit of Quantity	Quantity	Unit Price (Baht)	Production Cost (Baht)
① Seed	kg	50	6.0	300.0
N (Nutrient Basis)	kg	29	14.9	432.1
P (Nutrient Basis)	kg	36	14.7	529.2
K (Nutrient Basis)	kg	12	7.8	93.6
② Fertilizer	n.r.	n.r.	n.r.	1,054.9
Fungicide	time	2	119.6	239.2
Pesticide	time	2	151.8	303.6
Herbicide	time	1	189.5	189.5
③ Chemicals	n.r.	n.r.	n.r.	732.3
Hand Tractor	hour	20	15.2	304.0
Medium-Size Tractor	hour	3	213.4	640.2
Low-lift Pump	hour	32	13.3	425.6
Thresher	hour	1	108.1	108.1
④ Machinery	n.r.	n.r.	n.r.	1,477.9
Land Preparation	man/day	48	41.4	1,987.2
Planting	man/day			
Weeding	man/day			
Fertilizer Application	man/day			
Chemical Application	man/day			
Irrigation	man/day			
Harvesting	man/day			
Post-harvesting	man/day			
Transportation	man/day			
⑤ Farm Labour	man/day			
G. Total	n.r.	n.r.	n.r.	5,552.3

TABLE G-2-9 PRODUCTION COST OF GROUNDNUTS

(Baht / ha)

		Financial Cost	Conversion Factor	Economic Cost
Existing	Seed	1,167	0.86	1,004
	Fertilizer	91	0.92	84
	Chemical	91	0.92	84
	Machinery	967	0.76	735
	Farm Labour	4,282	0.92	3,939
	Others	330	0.92	304
	G. TOTAL	6,928	-	6,150
Planned	Seed	1,284	0.86	1,104
	Fertilizer	344	0.92	316
	Chemical	625	0.92	575
	Machinery	1,160	0.76	882
	Farm Labour	4,710	0.92	4,333
	Others	406	0.92	374
	G. TOTAL	8,529	-	7,584

TABLE G-2-10 PRODUCTION COST OF SUGERCANE

(Baht / ha)

		Financial Cost	Conversion Factor	Economic Cost
Existing	Seed	1,115	0.86	959
	Fertilizer	1,420	0.92	1,306
	Chemical	349	0.92	321
	Machinery	1,304	0.76	991
	Farm Labour	5,773	0.92	5,311
	Others	498	0.92	458
	G. TOTAL	10,459	-	9,346
Planned	Seed	1,673	0.86	1,439
	Fertilizer	1,704	0.92	1,568
	Chemical	938	0.92	863
	Machinery	1,565	0.76	1,189
	Farm Labour	6,350	0.92	5,842
	Others	612	0.92	563
	G. TOTAL	12,842	-	11,464

TABLE G-2-11 PRODUCTION COST OF CASSAVA

(Baht / ha)

		Financial Cost	Conversion Factor	Economic Cost
Existing	Seed	386	0.86	359
	Fertilizer	344	0.92	316
	Chemical	625	0.92	575
	Machinery	904	0.76	687
	Farm Labour	3,605	0.92	3,317
	Others	309	0.92	284
	G. TOTAL	6,173	-	5,538
Planned	Seed			
	Fertilizer			
	Chemical			
	Machinery			
	Farm Labour			
	Others			
	G. TOTAL			

TABLE G-2-12 PRODUCTION COST OF TOMATO

(Baht / ha)

		Financial Cost	Conversion Factor	Economic Cost
Existing	Seed	1,120	0.86	963
	Fertilizer	823	0.92	757
	Chemical	175	0.92	161
	Machinery	847	0.76	644
	Farm Labour	2,372	0.92	2,182
	Others	267	0.92	246
	G. TOTAL	5,604	-	4,953
Planned	Seed	1,120	0.86	963
	Fertilizer	988	0.92	909
	Chemical	210	0.92	193
	Machinery	1,101	0.76	837
	Farm Labour	2,846	0.92	2,618
	Others	313	0.92	288
	G. TOTAL	6,578	-	5,808

TALBE G-2-13 (1) PRODUCTION COST OF MANGO (FINAL COST)

(Baht / ha)

Cost Item \ Year		1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year	10th Year
Existing	Seed	5,038	4,441	4,727	5,615	7,382	8,295	9,785	9,785	9,785	9,785
	Fertilizer	339	299	318	378	496	558	658	658	658	658
	Chemical	303	268	285	339	445	500	590	590	590	590
	Machinery	-	-	-	-	-	-	-	-	-	-
	Farm Labour	656	313	313	438	500	563	625	625	625	625
	Others	317	266	282	339	431	496	583	583	583	583
	G. TOTAL	6,653	5,587	5,925	7,109	9,254	10,412	11,651	12,241	12,241	12,241
Planned	Seed	7,520	6,629	7,055	8,381	11,018	12,381	14,605	14,605	14,605	14,605
	Fertilizer	678	597	635	755	992	1,115	1,315	1,315	1,315	1,315
	Chemical	606	536	57	677	890	1,000	1,180	1,180	1,180	11,80
	Machinery	1,151	1,018	1,084	1,288	1,694	1,903	2,245	2,245	2,245	2,245
	Farm Labour	6,563	3,125	3,125	4,375	5,000	5,625	6,250	6,250	6,250	6,250
	Others	825	595	656	774	1,031	1,101	1,280	1,280	1,280	1,280
	G. TOTAL	17,343	12,500	13,125	16,250	20,625	23,125	26,875	26,875	26,875	26,875

TABLE G-2-13 (2) PRODUCTION COST OF MANGO (ECONOMIC COST)

(Baht / ha)

Cost Item \ Year		1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year	10th Year
Existing	Seed	4,333	3,819	4,065	4,829	6,349	7,134	8,415	8,415	8,415	8,415
	Fertilizer	312	275	293	348	456	513	605	605	605	605
	Chemical	279	247	262	312	409	460	543	543	543	543
	Machinery	-	-	-	-	-	-	-	-	-	-
	Farm Labour	604	288	288	403	460	518	575	575	575	575
	Others	292	245	259	312	397	456	536	536	536	536
	G. TOTAL	5,820	4,874	5,167	6,204	8,071	9,081	10,674	10,674	10,674	10,674
Planned	Seed	6,467	5,701	6,067	7,208	6,475	10,648	12,560	12,560	12,560	12,560
	Fertilizer	624	549	584	685	913	1,026	1,210	1,210	1,210	1,210
	Chemical	558	493	524	623	819	920	1,086	1,086	1,086	1,086
	Machinery	875	774	824	979	1,287	1,446	1,706	1,706	1,706	1,706
	Farm Labour	6,038	2,875	2,875	4,025	4,600	5,175	5,750	5,750	5,750	5,750
	Others	759	547	604	712	949	1,013	1,178	1,178	1,178	1,178
	G. TOTAL	15,321	10,939	11,478	14,242	18,043	20,228	23,490	23,490	23,490	23,490

TABLE G-2-14 PRODUCTION COST OF BAMBOO (SWEET BAMBOO)

(Baht / ha)

		Financial Cost	Conversion Factor	Economic Cost
Existing	Seed			
	Fertilizer			
	Chemical			
	Machinery			
	Farm Labour			
	Others			
	G. TOTAL			
Planned	Seed	3,865	0.86	3,324
	Fertilizer	1,546	0.92	1,422
	Chemical	1,546	0.92	1,422
	Machinery	5,411	0.76	4,112
	Farm Labour	4,381	0.92	4,031
	Others	851	0.92	783
	G. TOTAL	17,600	-	15,094

TABLE G-2-15 PRODUCTION COST OF UPLAND RICE

(Baht / ha)

		Financial Cost	Conversion Factor	Economic Cost
Existing	Seed	250	0.86	215
	Fertilizer	1,720	0.92	1,582
	Chemical	340	0.92	313
	Machinery	750	0.76	555
	Farm Labour	2,200	0.92	2,024
	Others	260	0.92	239
	G. TOTAL	5,520	-	4,928
Planned	Seed			
	Fertilizer			
	Chemical			
	Machinery			
	Farm Labour			
	Others			
	G. TOTAL			

TABLE G-2-16 PRODUCTION COST OF SESAME

(Baht / ha)

		Financial Cost	Conversion Factor	Economic Cost
Existing	Seed	300	0.86	258
	Fertilizer	2,500	0.92	2,300
	Chemical	400	0.92	368
	Machinery	750	0.76	570
	Farm Labou	2,500	0.92	2,300
	Others	300	0.92	276
	G. TOTAL	6,750	-	6,072
Planned	Seed			
	Fertilizer			
	Chemical			
	Machinery			
	Farm Labour			
	Others			
	G. TOTAL			

TABLE G-2-17 PRODUCTION COST OF COCOON

(Baht / ha)

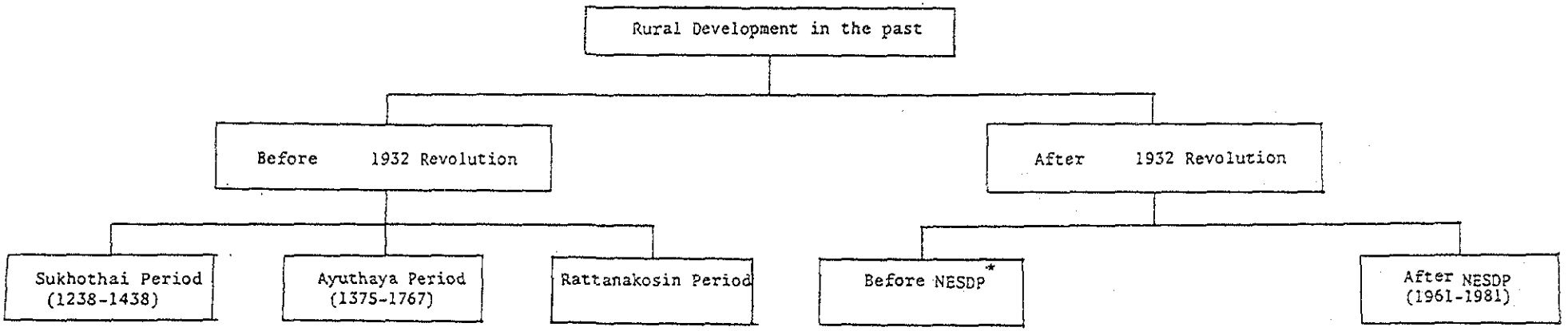
Item		Financial Cost	Conversion Factor	Economic Cost
Planned	Seed	1,250	0.86	1,075
	Fertilizer	1,910	0.92	1,757
	Chemical	540	0.92	497
	Machinery	636	0.76	483
	Farm Labour	1,863	0.92	1,714
	Others	310	0.92	285
	Mulberry Growing Sub Total	6,509	-	5,811
	Facilities and Equipment	2,500	0.92	2,300
	Farm Labour	5,347	0.92	4,919
	Others	392	0.92	361
	Cocoon Rearing Sub Total	8,239	-	7,580
	G. TOTAL	14,748	-	13,391

TABLE G-2-18 PRODUCTION COST OF FEED GRASS

(Baht / ha)

		Financial Cost	Conversion Factor	Economic Cost
Existing	Seed			
	Fertilizer			
	Chemical			
	Machinery			
	Farm Labour			
	Others			
	G. TOTAL			
Planned	Seed	60	0.86	52
	Fertilizer	96	0.92	88
	Chemical	0	0.92	0
	Machinery	75	0.76	57
	Farm Labour	153	0.92	141
	Others	19	0.92	18
	G. TOTAL	403	-	356

FIGURE G-1-1 (1 / 2) Rural Development



- Cities/Town were small and not devided into either rural or urban.
- Devleopment project were initiated and controlled by the Kings.
- The relationship between the Kings and his people were similar the father and son relations.

- Kingdom's governments were run by four department: Wient, Wang, Klong and Na.
- The Na (paddy field) is the most important agency with the power to control all agricultural develo-pment activities.

- King Rama V decided to create three western styled agencies: Ministry, sub-ministry and department.
- The Thai Kings and their development projects were the dominant factors for the maintenance of the kingdom's sovere-ignty and independence throughout that period.

- After World War I, the communist tactics forced the Thai government to acknowledge the urgency to respond by introducing many measures to curb the growth of communism. Rural Development programs had to be formulated to get rid of proverty of the Thai in rural areas.
- The rural restoration plan was one of the various projects for rural development
- Office of Local Development under the Thai Ministry of the Interior was introduced National Local Development. The program were set to eliminate poverty and improve the economic status by using the methods of "self-reliance".

- The first NESDB (1961-1966) the main development direction emphazied upon the expansion of economic growth.
- The second NESDP (1967-1971), the Thai government devoted more oftension to the rural development expenditures in r rural areas to 75-80% of total development budget of the country. (Many dams were constructed, Bhumipol Dam, Chao-phaya Dam, etc.). The other development program were, anti-malaria, increased compulsory education from 4 to 7 years, etc
- The third and the foruth NESDP, (1972-1981), the development direction emphazied upon econo-mic growth, distribution of wealth and reduction of income gap
- The fifth NESDP, (1982-1986), emphasizing on the development of poor rural areas. There were 33 projects for poor rural areas, nine of which on village activities, fourteen on basic administration programs and ten on production programs.

* National Economic and Social Development Plan

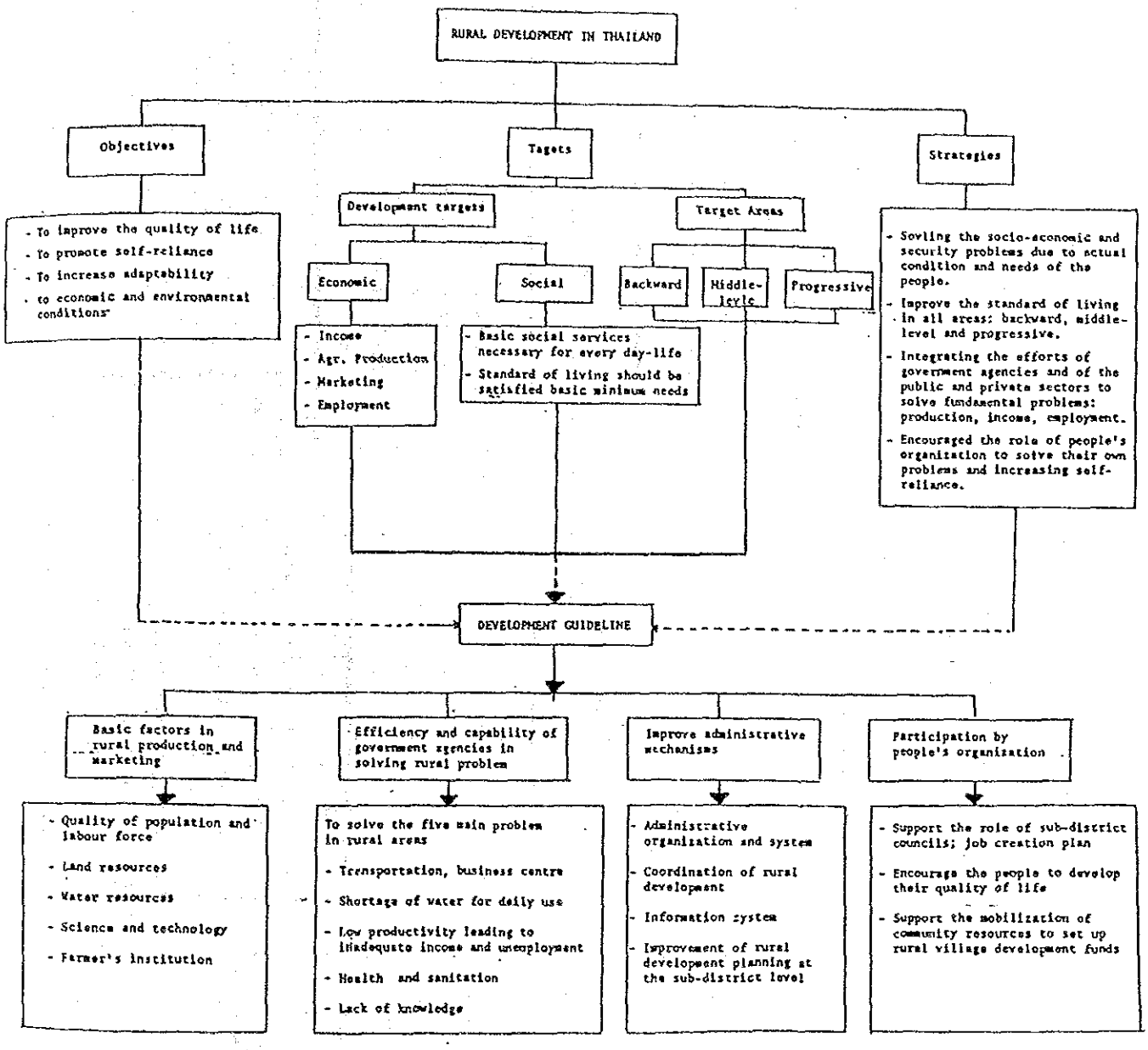

RURAL DEVELOPMENT IN THAILAND
Objectives
- To improve the quality of life
- To promote self-reliance
- To increase adaptability
- to economic and environmental conditions
Tagets
Development targets
Economic
- Income
- Agr. Production
- Marketing
- Employment
Social
- Basic social services necessary for every day-life
- Standard of living should be satisfied basic minimum needs
Target Areas
Backward
Middle-level
Progressive
Strategies
- Sovling the socio-economic and security problems due to actual condition and needs of the people.
- Improve the standard of living in all areas: backward, middle-level and progressive.
- Integrating the efforts of government agencies and of the public and private sectors to solve fundamental problems: production, income, employment.
- Encouraged the role of people's organization to solve their own problems and increasing self-reliance.
DEVELOPMENT GUIDELINE
Basic factors in rural production and marketing
- Quality of population and labour force
- Land resources
- Water resources
- Science and technology
- Farmer's institution
Efficiency and capability of government agencies in solving rural problem
To solve the five main problem in rural areas
- Transportation, business centre
- Shortage of water for daily use
- Low productivity leading to inadequate income and unemployment
- Health and sanitation
- Lack of knowledge
Improve administrative mechanisms
- Administrative organization and system
- Coordination of rural development
- Information system
- Improvement of rural development planning at the sub-district level
Participation by people's organization
- Support the role of sub-district councils; job creation plan
- Encourage the people to develop their quality of life
- Support the mobilization of community resources to set up rural village development funds

FIGURE G-1-2 Six Main Ministries Coordinated Working in Rural Development in Thailand

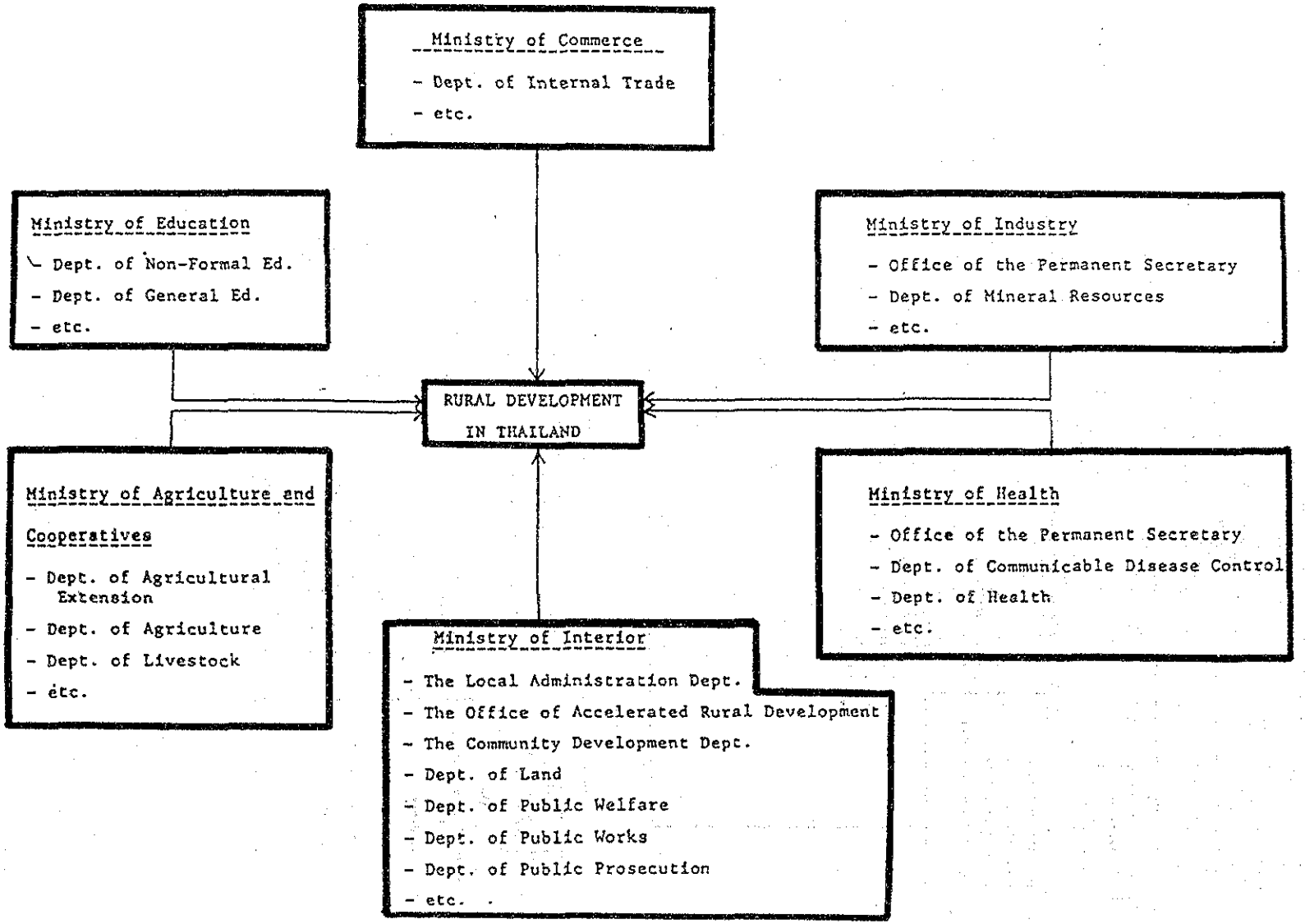
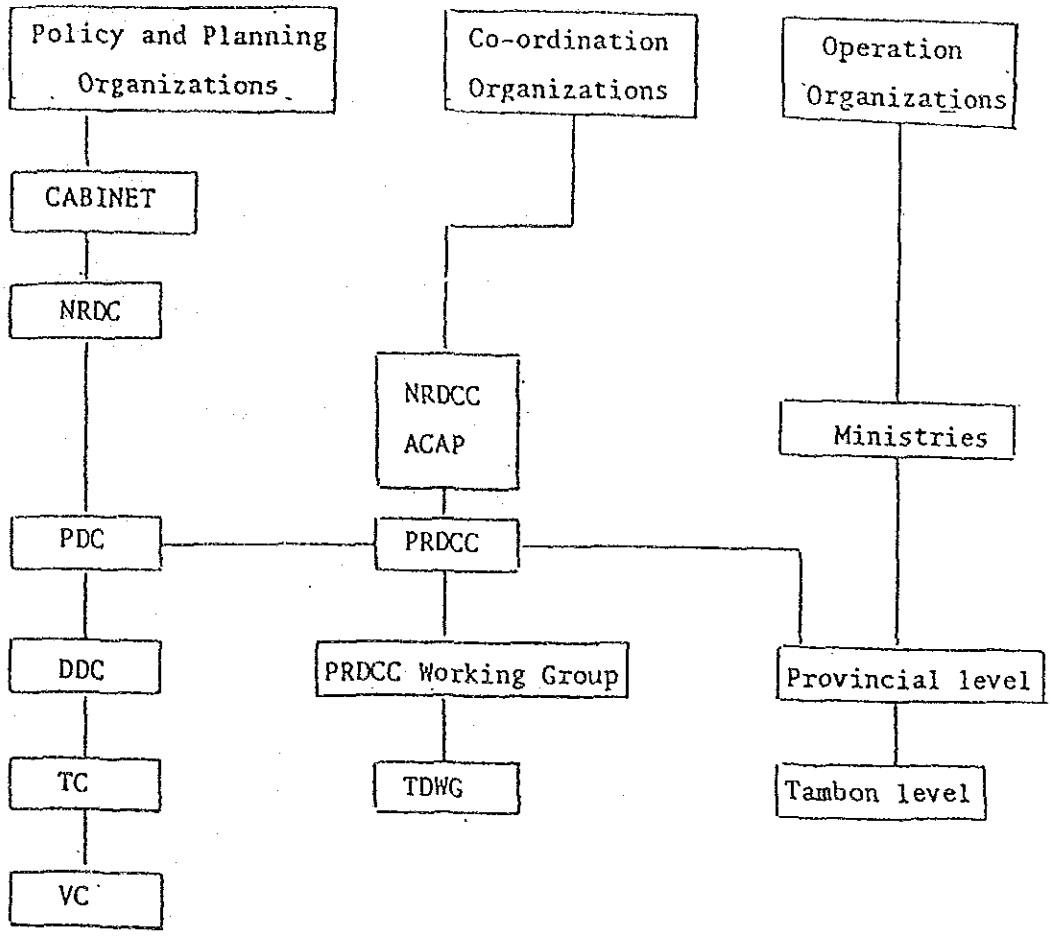


FIGURE G-1-3 RURAL DEVELOPMENT ORGANIZATION SYSTEM



NRDC = National Rural Development Committee
PDC = Provincial Rural Development Committee
DDC = District Rural Development Committee
TC = Tambon Rural Development Committee
VC = Village Development Committee
NRDCC = National Rural Development Co-ordination Center
IPIED = The Information Processing Institute for Education and Development
ACAP = Adminstrative Center for Assisting People to develop the North East Under his Majesty the King Initiative
PRDCC = Provincial Rural Development Co-opdination Center
TDWG = Tambon Development Working Group

APPENDIX H. COST ESTIMATE

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APPENDIX H. COST ESTIMATE

LIST OF TABLES

H-1 Composition of Project Cost

① Construction Cost

The Construction cost of the major works to be executed by contractors is estimated based on the quantities calculated from the preliminary design and the unit costs. The cost of overhead is consisted of management and operation cost, profit and taxes adopted from the current percentage ARD, as follows :

Description	Rate (%)
1.Management and Operation	5.0% of material and wage costs
2.Profit	8.5% of material and wage costs
3.Taxes	4.1% of (material and wage costs + 1. + 2.)

② Right of Way

The right of way will be required for the agricultural land in the reservoir area and along the canal alignment of the service area. The unit cost of right of way is 25,000 Baht/ha.

③ Survey and Investigation

The survey and investigation works consist of preparation of map, geological investigation and construction material survey for the detail design of the major works. The costs of survey and investigation works are estimated as follows.

Survey

Planmap survey scale 1 : 1,000 ..... 1,900 Baht/ha
Strip topography survey for canal .... 18,200 Baht/ha
Strip topography survey for road ..... 13,200 Baht/ha

Investigation

Drilling test ..... 3,100 Baht/m
Standard Penetration test ..... 1,040 Baht/Time

Permeability test ..... 18,200 Baht/Test
Laboratory test ..... 6,950 Baht/Sample

④ Detail Design and Supervision

The cost of consulting services for the detail design and construction supervision of the major works is estimated as shown in Table H-12. The cost has also been allocated among the five projects by ratio of the service areas.

⑤ Administration

The administration cost consists of allowance, salary for temporary personnel, cost for transportation and miscellaneous costs. It is estimated at 5 percent of the construction cost of the major works.

⑥ The physical contingency is estimated at 10 percent for model project and 20 percent for 5 year plan of the sum of construction cost and detail design and supervision cost.

⑦ Price Escalation

Escalation factors are shown as follows.

	1992	1993	1994	1995	1996
Local Currency	0.0685	0.1166	0.1668	0.2194	0.2742
Foreign Currency	0.0966	0.1051	0.1072	0.1372	0.1815

1. Major Material and Works

TABLE H-1 MATERIAL AND UNIT PRICE

Description	Unit	Unit Price (Baht): 1990		
		Total	L/C	F/C
A. Earth Work				
1. Stripping	cu.m.	10	3	7
2. Excavation (Earth)	cu.m.	32	8	24
" (Rock)	cu.m.	141	38	103
3. Embankment (Road)	cu.m.	50	14	36
" (Dam)	cu.m.	50	14	36
4. Backfill	cu.m.	50	25	25
5. Sodding	sq.m.	23	23	0
B. Materials				
1. Reinforced Concrete				
(1) Spillway and Bridge	cu.m.	4,390	2,415	1,975
(2) Others	cu.m.	3,800	2,090	1,710
2. Mortar	cu.m.	2,200	1,210	990
3. Grout	m	1,800	653	1,147
4. Drain	cu.m.	200	140	60
5. Stone	cu.m.	1,150	805	345
6. Rip-rap	cu.m.	410	287	123
7. Laterite	cu.m.	133	104	29
C. Materials (Manufactures)				
1. RC. Pipe				
(1) D= 0.80 m	m	900	495	405
(2) D= 0.90 m	m	1,200	660	540
(3) D= 1.00 m	m	1,400	770	630
(4) D= 1.10 m	m	1,600	880	720
2. Sheet Pile	m	2,450	735	1,715
3. I Block	sq.m	158	87	71
4. Concrete Pile	m	467	313	154

TABLE H-2 UNIT COST FOR CANALS

(Unit : Baht / m)

TYPE	Dimension *B(m)	*H(m)	*t(cm)	Concrete V(m3/m)	Excavation V(m3/m)	Embankment V(m3/m)	Stripping V(m3/m)	Laterite Pavement V(m3/m)	L/C (Baht)	F/C (Baht)	Total (Baht)
L12	0.50	0.65	5.00	0.157	0.498	2.480	4.755	0.800	360	344	704
L13	0.40	0.55	5.00	0.134	0.348	2.480	4.635	0.800	326	315	641
L14	0.40	0.50	5.00	0.125	0.300	2.118	4.500	0.800	308	288	596
L15	0.30	0.45	5.00	0.111	0.225	2.118	4.425	0.800	288	270	559
L16	0.30	0.40	5.00	0.102	0.187	2.118	4.390	0.800	276	260	536
Lateral Canal	0.30	0.40	5.00	-	0.187	2.118	4.390	0.800	140	148	288

Note: Unit cost included miscellaneous works with 10 % of material cost

TABLE H-3 COST OF WEIRS (1/2)

Catchment Area (sq.km) / River Width (m)		5 - 10 / 10				10 - 20 / 20			
Dimension		Quantity	L/C	F/C	Total (1,000 Baht)	Quantity	L/C	F/C	Total (1,000 Baht)
I = ~ 1/500	Concrete (cu.m)	122.0	254,980	208,620	464	244.0	509,960	417,240	927
H = 2.0 m	Stripping (cu.m)	180.0	540	1,260	2	360.0	1,080	2,520	4
L1 = 6.5 m	Excavation (cu.m)	121.2	970	2,909	4	242.4	1,939	5,818	8
L2 = 2.0 m	Sheet Pile (m)	42.0	30,870	72,030	103	72.0	52,920	123,480	176
T = 0.8 m	"I"Block (sq.m)	257.0	22,359	18,247	41	257.0	22,359	18,247	41
	Gate (Unit)	1.0	12,600	29,400	42	2.0	25,200	58,800	84
	Stone (cu.m)	25.0	20,125	8,625	29	50.0	40,250	17,250	58
	Miscellaneous		36,641	35,815	68		78,118	75,916	154
	Total		379,085	376,905	756		731,826	719,270	1,451
I = 1/500	Concrete (cu.m)	255.9	534,831	437,589	972	511.8	1,069,662	875,178	1,945
~ 1/1,000	Stripping (cu.m)	180.0	540	1,260	2	360.0	1,080	2,520	4
H = 3.0 m	Excavation (cu.m)	235.8	1,886	5,659	8	471.6	3,773	11,318	15
L1 = 8.2 m	Sheet Pile (m)	56.0	41,160	96,040	137	96.0	70,560	164,640	235
L2 = 3.0 m	"I"Block (sq.m)	413.0	35,931	29,323	65	413.0	35,931	29,323	65
T = 1.2 m	Gate (Unit)	1.0	12,600	29,400	42	2.0	25,200	58,800	84
	Stone (cu.m)	25.0	20,125	8,625	29	50.0	40,250	17,250	58
	Miscellaneous		77,002	72,644	125		137,110	127,493	265
	Total		724,075	680,540	1,405		1,383,566	1,286,523	2,670
I = 1/1,000	Concrete (cu.m)	430.0	898,700	735,300	1,634	860.0	1,797,400	1,470,600	3,268
~ 1/2,000	Stripping (cu.m)	180.0	540	1,260	2	360.0	1,080	2,520	4
H = 4.0 m	Excavation (cu.m)	362.8	2,902	8,707	12	725.6	5,805	17,414	23
L1 =10.0 m	Sheet Pile (m)	84.0	61,740	144,060	206	144.0	105,840	246,960	353
L2 = 4.0 m	"I"Block (sq.m)	604.0	52,548	42,884	95	604.0	52,548	42,884	95
T = 1.5 m	Gate (Unit)	1.0	12,600	29,400	42	2.0	25,200	58,800	84
	Stone (cu.m)	25.0	20,125	8,625	29	50.0	40,250	17,250	58
			116,456	108,666	225		214,981	197,710	413
	Total		1,165,612	1,078,903	2,245		2,243,104	2,054,138	4,297

TABLE H-3 COST OF WEIRS (2/2)

Catchment Area (sq.km) / River Width (m)		20 - 50 / 30				50 - 100 / 45.0			
Dimension		Quantity	L/C	F/C	Total (1,000 Baht)	Quantity	L/C	F/C	Total (1,000 Baht)
I = ~ 1/500	Concrete (cu.m)	366.0	764,940	625,860	1,391	549.0	1,147,410	938,790	2,086
H = 2.0 m	Stripping (cu.m)	900.0	2,700	6,300	9	1,800.0	5,400	12,600	18
L1 = 6.5 m	Excavation (cu.m)	363.6	2,909	8,726	12	545.4	4,363	13,090	17
L2 = 2.0 m	Sheet Pile (m)	108.0	79,380	185,220	265	165.0	121,275	282,975	404
T = 0.8 m	"I"Block (sq.m)	257.0	22,359	18,247	41	257.0	22,359	18,247	41
	Gate (Unit)	3.0	37,800	88,200	126	4.0	50,400	117,600	168
	Stone (cu.m)	125.0	100,625	43,125	144	250.0	201,250	86,250	288
	Miscellaneous	254	113,200	109,276	222		167,665	158,712	326
	Total	2,376	1,123,913	1,084,954	2,209		1,720,123	1,628,263	3,348
I = 1/500	Concrete (cu.m)	767.7	1,604,493	1,312,767	2,917	1,151.6	2,406,740	1,969,151	4,376
~ 1/1,000	Stripping (cu.m)	900.0	2,700	6,300	9	1,800.0	5,400	12,600	18
H = 3.0 m	Excavation (cu.m)	707.4	5,659	16,978	23	1,061.1	8,489	25,466	34
L1 = 8.2 m	Sheet Pile (m)	144.0	105,840	246,960	353	220.0	161,700	377,300	539
L2 = 3.0 m	"I"Block (sq.m)	413.0	35,931	29,323	65	413.0	35,931	29,323	65
T = 1.2 m	Gate (Unit)	3.0	37,800	88,200	126	4.0	50,400	117,600	168
	Stone (cu.m)	125.0	100,625	43,125	144	250.0	201,250	86,250	288
	Miscellaneous		201,610	185,699	387		299,332	273,287	573
	Total		2,094,658	1,929,352	4,024		3,169,241	2,890,977	6,060
I = 1/1,000	Concrete (cu.m)	1,290.0	2,696,100	2,205,900	4,902	1,935.0	4,044,150	3,308,850	7,353
~ 1/2,000	Stripping (cu.m)	900.0	2,700	6,300	9	1,800.0	5,400	12,600	18
H = 4.0 m	Excavation (cu.m)	1,088.4	8,707	26,122	35	1,632.7	13,061	39,184	52
L1 =10.0 m	Sheet Pile (m)	216.0	158,760	370,440	529	330.0	242,550	565,950	809
L2 = 4.0 m	"I"Block (sq.m)	604.0	52,548	42,884	95	604.0	52,548	42,884	95
T = 1.5 m	Gate (Unit)	3.0	37,800	88,200	126	4.0	50,400	117,600	168
	Stone (cu.m)	125.0	100,625	43,125	144	250.0	201,250	86,250	288
			317,953	290,264	608		472,459	429,852	902
	Total		3,375,193	3,073,234	6,448		5,081,819	4,603,170	9,685

TABLE H-4 UNIT COST OF ROADS

	Quantity	L/C	F/C	Total
(1) Standard (10 km)				
Stripping (cu.m)	60,000	180,000	420,000	600,000
Embankment (cu.m)	39,400	551,600	1,418,400	1,970,000
Laterite Pavemement (cu.m)	12,000	1,248,000	348,000	1,596,000
Miscellaneous Works		411,757	454,771	866,528
Sub-total		2,391,357	2,641,171	5,032,528
Crossing (places)	2	64,276	52,588	116,864
Total		2,455,633	2,693,759	5,149,392
Standara Road per 1.0 km (Unit 1,000 Baht)		246	269	515
(2) "I"block (10 km)				
Stripping (cu.m)	60,000	180,000	420,000	600,000
Embankment (cu.m)	39,400	551,600	1,418,400	1,970,000
"I"Block Pavement(Baht/km)	10	5,472,500	4,477,500	9,950,000
Miscellaneous Works		1,253,228	1,275,812	2,529,040
Sub-total		7,457,328	7,591,712	15,049,040
Crossing (places)	2	64,276	52,588	116,864
Total		7,521,604	7,644,300	15,165,904
"I"Block Road per 1.0 km (Unit 1,000 Baht)		752	764	1,516
(3) Service Road Type I (1 km)				
Stripping (cu.m)	6,000	18,000	42,000	60,000
Embankment (cu.m)	2,680	37,520	96,480	134,000
Laterite Pavemement (cu.m)	1,000	104,000	29,000	133,000
Miscellaneous Works		14,835	13,398	28,234
Total		174,355	180,878	355,234
(Unit 1,000 Baht)				
Service Road Type I per 1.0 km		174	181	355
(3) Service Road Type II (1 km)				
Stripping (cu.m)	6,000	18,000	42,000	60,000
Embankment (cu.m)	1,690	23,660	60,840	84,500
Laterite Pavemement (cu.m)	800	83,200	23,200	106,400
Miscellaneous Works		18,729	18,276	37,005
Total		143,589	144,316	287,905
(Unit 1,000 Baht)				
Service Road Type I per 1.0 km		144	144	288

TABLE H-5 COST FOR DRILLING DEEP WELL

The Cost of Well ····· Diameter 1.5 and 6. Depth 140 feet
(Improving Cost of Budget Office Beginning form, Mar 1. 1991)

No.	Size ø inch	Oil	The Cost			Total Baht/Well	Fine Baht/Well	L/C	F/C
			Maintenance	Material	Allowance				
1	4	10,473	6,813	35,633	11,770	64,689	64,700	23,960	40,740

H-4 Project Costs

Project costs are presented in the following tables.

TABLE H-6 (1/5) PROJECT COST OF OVERALL 5-YEAR PLAN

- PHITSANULOK PROVINCE -

- Unit : ฿ 1,000 -

Description	Model Project			Other Project			Total Cost		
	L/C	F/C	Total	L/C	F/C	Total	L/C	F/C	Total
1. Irrigation									
(1) Storage Scheme	(47,902)	(62,928)	(110,830)	-	-	-	(47,902)	(62,928)	(110,830)
Dam	22,667	29,382	52,049	-	-	-	22,667	29,382	52,049
Main Canal	11,741	15,377	27,118	-	-	-	11,741	15,377	27,118
Lateral Canal	5,019	6,836	11,855	-	-	-	5,019	6,836	11,855
On-farm Works	1,117	1,666	2,783	-	-	-	1,117	1,666	2,783
Overhead Cost	7,358	9,667	17,025	-	-	-	7,358	9,667	17,025
(2) Run-of-River Scheme	-	-	-	(23,875)	(30,642)	(54,517)	(23,875)	(30,642)	(54,517)
Diversion Weir	-	-	-	7,705	7,183	14,888	7,705	7,183	14,888
Canal	-	-	-	12,502	18,752	31,254	12,502	18,752	31,254
Overhead Cost	-	-	-	3,668	4,707	8,375	3,668	4,707	8,375
Total (1)	47,902	62,928	110,830	23,875	30,642	54,517	71,777	93,570	165,347
2. Agriculture									
(1) Sericulture	368	236	604	1,840	1,180	3,020	2,208	1,416	3,624
(2) Livestock	519	923	1,442	520	924	1,444	1,039	1,847	2,886
(3) Inland Fisheries	130	303	433	14,430	33,617	48,047	14,560	33,920	48,480
Total (2)	1,017	1,462	2,479	16,790	35,721	52,511	17,807	37,813	54,990
3. Rural Road									
(1) Standard Road	4,431	4,481	8,912	107,135	97,303	204,438	111,566	101,784	213,350
(2) I Block Pavement	752	764	1,516	36,096	8,688	44,784	36,848	9,452	46,300
(3) Service Road (I)	261	272	533	10,040	10,444	20,484	10,301	10,716	21,017
(4) Service Road (II)	72	72	144	10,080	10,080	20,160	10,152	10,152	20,304
(5) Overhead Cost	1,001	1,013	2,014	29,648	22,962	52 610	30,649	23,975	54,624
Total (3)	6,517	6,602	13,119	192,999	149,477	3/ ,476	199,516	156,079	355,595
4. Rural Water Supply									
(1) Deep Well	72	122	194	4,216	7,171	11,387	4,288	7,293	11,581
5. Cottage Industry									
(1) Silk Weaving	216	54	270	-	-	-	216	54	270
(2) Bamboo Hand Craft	196	49	245	588	147	735	784	196	980
(3) Jewel Polishing	-	-	-	720	180	900	720	180	900
Total (5)	412	103	515	1,308	327	1,635	1,720	430	2,150
6. Building									
(1) Project Office	300	300	600	-	-	-	300	300	600
(2) Training Center	416	264	680	-	-	-	416	264	680
Total (6)	716	564	1,280	-	-	-	716	564	1,280
7. Training Equipment	80	420	500	-	-	-	80	420	500
8. Land Acquisition	1,350	-	1,350	500	-	500	1,850	-	1,850
9. Survey and Investigat	2,708	-	2,708	5,107	-	5,107	7,815	-	7,815
10. Administration	6,446	-	6,446	20,501	-	20,501	26,947	-	26,947
11. Consulting Services	1,441	12,440	13,881	-	-	-	1,441	12,440	13,881
Base Cost (1~11)	68,661	84,641	153,302	265,296	223,338	488,634	333,957	307,979	641,936
12. Physical Contingencies	6,866	8,463	15,329	53,059	44,668	97,727	59,925	53,131	113,056
13. Price Escalation	16,901	13,407	30,308	58,104	35,218	93,322	75,005	48,625	123,630
Total Project Cost	92,428	106,511	198,939	376,459	303,224	679,683	468,887	409,735	878,622

TABLE H-6 (2/5) PROJECT COST OF OVERALL 5-YEAR PLAN

- SUKHOTHAI PROVINCE -

- Unit : ฿ 1,000 -

Description	Model Project			Other Project			Total Cost		
	L/C	F/C	Total	L/C	F/C	Total	L/C	F/C	Total
1. Irrigation									
(1) Storage Scheme	(47,909)	(54,329)	(102,238)	-	-	-	(47,909)	(54,329)	(102,238)
Dam	34,160	38,367	72,527	-	-	-	34,160	38,367	72,527
Main Canal	4,888	5,218	10,106	-	-	-	4,888	5,218	10,106
Lateral Canal	873	1,462	2,335	-	-	-	873	1,462	2,335
On-farm Works	628	936	1,564	-	-	-	628	936	1,564
Overhead Cost	7,360	8,346	15,706	-	-	-	7,360	8,346	15,706
(2) Run-of-River Scheme	-	-	-	(21,464)	(30,801)	(52,265)	(21,464)	(30,801)	(52,265)
Diversion Weir	-	-	-	4,104	4,974	9,078	4,104	4,974	9,078
Canal	-	-	-	14,063	21,095	35,158	14,063	21,095	35,158
Overhead Cost	-	-	-	3,297	4,732	8,029	3,297	4,732	8,029
Total (1)	47,909	54,329	102,238	21,464	30,801	52,265	69,373	85,130	154,503
2. Agriculture									
(1) Sericulture	261	203	464	1,365	911	2,276	1,626	1,114	2,740
(2) Livestock	259	462	721	780	1,386	2,166	1,039	1,848	2,887
(3) Inland Fisheries	74	160	234	18,816	40,672	59,488	18,890	40,832	59,722
Total (2)	594	825	1,419	20,961	42,969	63,930	21,555	43,794	65,349
3. Rural Road									
(1) Standard Road	7,290	7,266	14,556	49,373	43,755	93,128	56,663	51,021	107,684
(2) I Block Pavement	3,760	3,820	7,580	12,784	3,077	15,861	16,544	6,897	23,441
(3) Service Road (I)	1,392	1,448	2,840	7,743	8,055	15,798	9,135	9,503	18,638
(4) Service Road (II)	432	432	864	11,016	11,016	22,032	11,448	11,448	22,896
(5) Overhead Cost	2,337	2,353	4,690	14,686	11,961	26,647	17,023	14,314	31,337
Total (3)	15,211	15,319	30,530	95,602	77,864	173,466	110,813	93,183	203,996
4. Rural Water Supply									
(1) Deep Well	168	285	453	2,756	4,687	7,443	2,924	4,972	7,896
5. Cottage Industry									
(1) Silk Weaving	216	54	270	-	-	-	216	54	270
(2) Bamboo Hand Craft	196	49	245	980	245	1,225	1,176	294	1,470
(3) Jewel Polishing	-	-	-	720	180	900	720	180	900
Total (5)	412	103	515	1,700	425	2,125	2,112	528	2,640
6. Building									
(1) Project Office	300	300	600	-	-	-	300	300	600
(2) Training Center	416	264	680	-	-	-	416	264	680
Total (6)	716	564	1,280	-	-	-	716	564	1,280
7. Training Equipment	80	420	500	-	-	-	80	420	500
8. Land Acquisition	600	-	600	594	-	594	1,194	-	1,194
9. Survey and Investigat.	3,337	-	3,337	3,792	-	3,792	7,129	-	7,129
10. Administration	6,847	-	6,847	14,962	-	14,962	21,809	-	21,809
11. Consulting Services	2,005	17,299	19,304	-	-	-	2,005	17,299	19,304
Base Cost (1~11)	77,879	89,144	167,023	161,831	156,746	318,577	239,710	245,890	485,600
12. Physical Contingencies	7,788	8,915	16,703	32,366	31,349	63,715	40,154	40,264	80,418
13. Price Escalation	18,594	13,713	32,307	34,347	25,141	59,488	52,941	38,854	91,795
Total Project Cost	104,261	111,772	216,033	228,544	213,236	441,780	332,805	325,008	657,813

TABLE H-6 (3/5) PROJECT COST OF OVERALL 5-YEAR PLAN

- KAMPHAENG PHET PROVINCE -

- Unit : ฿ 1,000 -

Description	Model Project			Other Project			Total Cost		
	L/C	F/C	Total	L/C	F/C	Total	L/C	F/C	Total
1. Irrigation									
(1) Storage Scheme	(24,604)	(28,273)	(52,877)	-	-	-	(24,604)	(28,273)	(52,877)
Dam	17,195	19,778	36,973	-	-	-	17,195	19,778	36,973
Main Canal	2,827	3,070	5,897	-	-	-	2,827	3,070	5,897
Lateral Canal	606	790	1,396	-	-	-	606	790	1,396
On-farm Works	196	292	488	-	-	-	196	292	488
Overhead Cost	3,780	4,343	8,123	-	-	-	3,780	4,343	8,123
(2) Run-of-River Scheme	-	-	-	(52,355)	(69,386)	(121,741)	(52,355)	(69,386)	(121,741)
Diversion Weir	-	-	-	13,667	12,760	26,427	13,667	12,760	26,427
Canal	-	-	-	30,645	45,967	76,612	30,645	45,967	76,612
Overhead Cost	-	-	-	8,043	10,659	18,702	8,043	10,659	18,702
Total (1)	24,604	28,273	52,877	52,355	69,386	121,741	76,959	97,659	174,618
2. Agriculture									
(1) Sericulture	184	118	302	2,024	1,298	3,322	2,208	1,416	3,624
(2) Livestock	-	-	-	1,560	2,772	4,332	1,560	2,772	4,332
(3) Inland Fisheries	114	262	376	14,651	33,683	48,334	14,765	33,945	48,710
Total (2)	298	380	678	18,235	37,753	55,988	18,533	38,133	56,666
3. Rural Road									
(1) Standard Road	-	-	-	51,865	45,946	97,811	51,865	45,946	97,811
(2) I Block Pavement	752	764	1,516	19,552	5,289	24,841	20,304	6,053	26,357
(3) Service Road (I)	-	-	-	15,486	16,109	31,595	15,486	16,109	315,595
(4) Service Road (II)	106	257	363	24,768	24,768	49,536	24,874	25,025	49,899
(5) Overhead Cost	156	185	341	20,268	16,718	36,986	20,424	16,903	37,327
Total (3)	1,014	1,206	2,220	131,939	108,830	240,769	132,953	110,036	242,989
4. Rural Water Supply									
(1) Deep Well	96	163	259	5,008	8,515	13,523	5,104	8,678	13,782
5. Cottage Industry									
(1) Silk Weaving	216	54	270	-	-	-	216	54	270
(2) Bamboo Hand Craft	-	-	-	784	196	980	784	196	980
(3) Jewel Polishing	-	-	-	720	180	900	720	180	900
Total (5)	216	54	270	1,504	376	1,880	1,720	430	2,150
6. Building									
(1) Project Office	300	300	600	-	-	-	300	300	600
(2) Training Center	416	264	680	-	-	-	416	264	680
Total (6)	716	564	1,280	-	-	-	716	564	1,280
7. Training Equipment	80	420	500	-	-	-	80	420	500
8. Land Acquisition	475	-	475	1,668	-	1,668	2,143	-	2,143
9. Survey and Investigat.	3,684	-	3,684	5,929	-	5,929	9,613	-	9,613
	2,903	-	2,903	18,897	-	18,897	21,800	-	21,800
10. Administration	1,022	8,833	9,855	-	-	-	1,022	8,833	9,855
11. Consulting Services	35,108	39,893	75,001	235,535	224,860	460,395	270,643	264,753	535,396
Base Cost (1~11)	3,511	3,990	7,501	47,107	44,972	92,079	50,618	48,962	99,580
12. Physical Contingencies	7,685	5,809	13,494	53,246	36,208	89,454	60,931	42,017	102,948
13. Price Escalation									
	46,304	49,692	95,996	335,888	306,040	641,928	382,192	355,732	737,924
Total Project Cost									

TABLE H-6 (4/5) PROJECT COST OF OVERALL 5-YEAR PLAN

- TAK PROVINCE -

- Unit : ฿ 1,000 -

Description	Model Project			Other Project			Total Cost		
	L/C	F/C	Total	L/C	F/C	Total	L/C	F/C	Total
1. Irrigation									
(1) Storage Scheme	(40,943)	(42,183)	(82,126)	-	-	-	(40,943)	(42,183)	(83,126)
Dam	28,880	28,589	57,469	-	-	-	28,880	28,589	57,469
Main Canal	3,556	4,194	7,750	-	-	-	3,556	4,194	7,750
Lateral Canal	1,791	2,284	4,075	-	-	-	1,791	2,284	4,075
On-farm Works	426	636	1,062	-	-	-	426	636	1,062
Overhead Cost	6,290	6,480	12,770	-	-	-	6,290	6,480	12,770
(2) Run-of-River Scheme	-	-	-	(36,878)	(50,449)	(87,327)	(36,878)	(50,449)	(87,327)
Diversion Weir	-	-	-	7,706	7,441	15,147	7,706	7,441	15,147
Canal	-	-	-	23,507	35,258	58,765	23,507	35,258	58,765
Overhead Cost	-	-	-	5,665	7,750	13,415	5,665	7,750	13,415
Total (1)	40,943	42,183	83,126	36,878	50,449	87,327	77,821	92,632	170,453
2. Agriculture									
(1) Sericulture	552	354	906	184	118	302	736	472	1,208
(2) Livestock	259	462	721	1,300	2,310	3,610	1,559	2,772	4,331
(3) Inland Fisheries	195	459	654	5,346	12,588	17,934	5,541	13,047	18,588
Total (2)	1,006	1,275	2,281	6,830	15,016	21,846	7,836	16,291	24,127
3. Rural Road									
(1) Standard Road	-	-	-	31,591	26,876	58,467	31,591	26,876	58,467
(2) I Block Pavement	-	-	-	4,136	996	5,132	4,136	996	5,132
(3) Service Road (I)	-	-	-	5,829	6,064	11,893	5,829	6,064	11,893
(4) Service Road (II)	130	130	260	8,136	8,136	16,272	8,266	8,266	16,532
(5) Overhead Cost	24	24	48	9,018	7,636	16,654	9,042	7,660	16,702
Total (3)	154	154	308	58,710	49,708	108,418	58,864	49,862	108,726
4. Rural Water Supply									
(1) Deep Well	144	244	388	1,630	2,771	4,401	1,774	3,015	4,789
5. Cottage Industry									
(1) Silk Weaving	216	54	270	-	-	-	216	54	270
(2) Bamboo Hand Craft	-	-	-	1,960	490	2,450	1,960	490	2,450
(3) Jewel Polishing	360	90	450	360	90	450	720	180	900
Total (5)	576	144	720	2,320	580	2,900	2,896	724	3,620
6. Building									
(1) Project Office	300	300	600	-	-	-	300	300	600
(2) Training Center	416	264	680	-	-	-	416	264	680
Total (6)	716	564	1,280	-	-	-	716	564	1,280
7. Training Equipment	80	420	500	-	-	-	80	420	500
8. Land Acquisition	825	-	825	868	-	868	1,693	-	1,693
9. Survey and Investigat.	3,805	-	3,805	2,344	-	2,344	6,149	-	6,149
10. Administration	4,430	-	4,430	10,153	-	10,153	14,583	-	14,583
11. Consulting Services	1,587	13,693	15,280	-	-	-	1,587	13,693	15,280
Base Cost (1~11)	54,266	58,677	112,943	119,733	118,524	238,257	173,999	177,201	351,200
12. Physical Contingencies	5,427	5,867	11,294	23,948	23,704	47,652	29,375	29,571	58,946
13. Price Escalation	12,091	8,364	20,455	26,471	18,634	45,105	38,562	26,998	65,560
Total Project Cost	71,784	72,908	144,692	170,152	160,862	331,014	241,936	233,770	475,706

TABLE H-6 (5/5) PROJECT COST OF OVERALL 5-YEAR PLAN
- KAMPHAENG PHET FOC -

Description	Unit	Q'ty	Unit Price (฿)	Cost (฿) L/C	Cost (฿) F/C	Cost (฿) Total
1. Building						
- Training room	sq.m	100	7,000	420,000	280,000	700,000
- Fixture	L.S			140,000	-	140,000
Total (1)				560,000	280,000	840,000
2. Equipment						
(1) Construction						
- Percussion drilling	set	3		12,480,000	36,420,000	48,900,000
- Reservoir construction	set	1		22,570,000	68,170,000	90,740,000
- Road maintenance	set	1		2,740,000	7,540,000	10,280,000
Sub-total				37,790,000	112,130,000	149,920,000
(2) Training	L.S			313,000	1,337,000	1,650,000
Total (2)				38,103,000	113,467,000	151,570,000
Total (1 + 2)				38,663,000	113,747,000	152,410,000
3. Contingencies				3,866,000	11,375,000	15,241,000
4. Price Escalation				8,827,000	16,411,000	25,238,000
Total Cost				51,356,000	141,533,000	192,889,000

TABLE H-7 COST ESTIMATE OF MODEL PROJECT
- HUAI SAM RU -

Description	Unit	Q'ty	Unit Price (฿)	Cost (฿) L/C	Cost (฿) F/C	Cost (฿) Total
1. Dam						
(1) Dam Body						
Stripping	cu.m	9,430	10	28,290	66,010	94,300
Trench excavation	cu.m	5,335	141	202,730	549,505	752,235
Grouting	m	530	1,800	345,764	607,337	953,101
Embankment	cu.m	121,610	50	1,702,540	4,377,960	6,080,500
Vertical drain	cu.m	1,710	200	239,400	102,600	342,000
Horizontal drain	cu.m	1,087	200	152,180	65,220	217,400
Riprap filter	cu.m	1,478	410	424,186	181,794	605,980
Riprap	cu.m	3,325	410	954,275	408,975	1,363,250
Toe rock	cu.m	1,547	1,150	1,245,335	533,715	1,779,050
Sodding	sq.m	7,117	23	163,691	-	163,691
Outlet (ø1,100 mm)	L.S			3,288,600	7,673,400	10,962,000
Miscellaneous (10%)	L.S			874,699	1,456,652	2,331,351
Sub - total				9,621,690	16,023,168	25,644,858
(2) Spillway						
Rock excavation	cu.m	26,948	141	1,024,024	2,775,644	3,799,668
Earth excavation	cu.m	26,948	32	215,584	646,752	862,336
Concrete works	cu.m	4,312	4,390	10,413,480	8,516,200	18,929,680
Backfill	cu.m	8,481	50	212,025	212,025	424,050
Miscellaneous (10%)	L.S			1,180,197	1,208,211	2,388,408
Sub - total				13,045,310	13,358,832	26,404,142
Total Dam Cost				22,667,000	29,382,000	52,049,000
2. Canal						
(1) Main Canal	km	13.50				
Stripping	cu.m	39,300	10	117,900	275,100	393,000
Excavation	cu.m	63,515	32	508,120	1,524,360	2,032,480
Embankment	cu.m	66,675	50	933,450	2,400,300	3,333,750
Concrete works	cu.m	887	2,200	1,073,270	878,130	1,951,400
R. C pipe ø 1,100	m	1,700	1,600	1,496,000	1,224,000	2,720,000
ø 1,000	m	1,850	1,400	1,424,500	1,165,500	2,590,000
ø 900	m	400	1,200	264,000	216,000	480,000
ø 800	m	4,330	900	2,143,350	1,753,650	3,897,000
Laterite	cu.m	10,800	133	1,123,200	313,200	1,436,400
Structure	L.S			2,202,660	5,139,540	7,342,200
Miscellaneous works	L.S			454,550	487,220	941,770
Sub - total				11,741,000	15,377,000	27,118,000
(2) Lateral Canal	km	23.4		5,019,000	6,836,000	11,855,000
Total Canal Cost				16,760,000	22,213,000	38,973,000
3. On-farm Works	ha	1,022		1,117,000	1,666,000	2,783,000
4. Agricultural Development						
(1) Sericulture						
Earth work	cu.m	3,760	25	28,000	6,600	94,000
Working house	place	2	170,000	170,000	170,000	340,000
Facilities	L.S			170,000	-	170,000
Sub - total				368,000	236,000	604,000
(2) Livestock						
Earth work	cu.m	42,480	25	319,000	743,000	1,062,000
Working house	place	2	170,000	170,000	170,000	340,000
Facilities	L.S			30,000	10,000	40,000
Sub - total				519,000	923,000	1,442,000
(3) Inland Fisheries						
Earth work	cu.m	4,200	100	122,000	298,000	420,000
Structures	L.S			8,000	8,000	13,000
Sub - total				130,000	303,000	433,000
Total				1,017,000	1,462,000	2,479,000
5. Rural Road						
Standard road	km	13.5	515,000	3,321,000	3,631,500	6,952,500
Bridge	L.S			1,110,000	849,500	1,959,500
I block pavement	km	1.0	1,516,000	752,000	764,000	1,516,000
Service road (I)	km	1.5	355,000	261,000	271,500	532,500
Service road (II)	km	0.5	288,000	72,000	72,000	144,000
Total				5,516,000	5,588,500	11,104,500
6. Rural Water Supply						
Deep well	place	3	64,700	71,880	122,220	194,100
7. Cottage Industry						
(1) Silk weaving	place	1	270	216,000	54,000	270,000
(2) Bamboo handicraft	place	1	245	196,000	49,000	245,000
(3) Jewel polishing	place	-	-	-	-	-
Total				412,000	103,000	515,000
8. Building						
(1) Project Office	sq.m	200	300,000	300,000	300,000	600,000
(2) Training Center						
House	sq.m	144	2,000	144,000	144,000	288,000
Facilities	L.S			60,000	110,000	170,000
Outdoor works	L.S			202,000	-	202,000
Fixtures	L.S			10,000	10,000	20,000
Sub - total				416,000	264,000	680,000
Total				716,000	564,000	1,280,000
9. Training Equipment				80,000	420,000	500,000
10. Land Acquisition	ha	54	25,000	1,350,000	-	1,350,000
11. Survey and Investigation	L.S			2,708,000	-	2,708,000
12. Administration	L.S			6,446,000	-	6,446,000
13. Consulting Services				1,441,000	12,440,000	13,881,000

TABLE H-7 COST ESTIMATE OF MODEL PROJECT
- HUAI NONG KHO -

Description	Unit	Q'ty	Unit Price (B)	Cost (B)		
				L/C	F/C	Total
1. Dam						
(1) Dam Body						
Stripping	cu.m	31,410	10	94,230	219,870	314,100
Trench excavation	cu.m	18,471	32	147,768	443,304	591,072
Grouting	m	-	1,800	-	-	-
Embankment	cu.m	398,392	50	5,577,488	14,342,112	19,919,600
Vertical drain	cu.m	7,042	200	985,880	422,520	1,408,400
Horizontal drain	cu.m	10,750	200	1,505,000	645,000	2,150,000
Riprap filter	cu.m	4,864	410	1,395,968	598,272	1,994,240
Riprap	cu.m	10,944	410	3,140,928	1,346,112	4,487,040
Toe rock	cu.m	10,161	1,150	8,179,605	3,505,545	11,685,150
Sodding	sq.m	23,817	23	547,791	-	547,791
Outlet (ø900 mm)	L.S			2,505,000	5,845,000	8,350,000
Miscellaneous	L.S			2,996,347	4,530,153	7,526,500
Sub - total				27,076,005	31,897,888	58,973,893
(2) Spillway						
Rock excavation	cu.m	5,304	141	201,552	546,312	747,864
Earth excavation	cu.m	12,376	32	99,008	297,024	396,032
Concrete works	cu.m	2,504	4,390	6,047,160	4,945,400	10,992,560
Backfill	cu.m	3,691	50	92,275	92,275	184,550
Miscellaneous (10%)	L.S			644,000	588,101	1,232,101
Sub - total				7,083,995	6,469,112	13,553,107
Total Dam Cost				34,160,000	38,367,000	72,527,000
2. Canal						
(1) Main Canal	km	7.20				
Stripping	cu.m	32,750	10	98,250	229,250	327,500
Excavation	cu.m	2,358	32	18,864	56,592	75,456
Embankment	cu.m	16,081	50	225,134	578,916	804,050
Concrete works	cu.m	926	2,200	1,120,460	916,740	2,037,200
Laterite	cu.m	5,760	133	599,040	167,040	766,080
Structure	L.S	80	1,400,000	479,340	1,118,460	1,597,800
Miscellaneous works	L.S			2,038,912	2,459,002	4,497,914
Sub - total				4,580,000	5,526,000	1,106,000
(2) Lateral Canal	km	1.8		873,000	1,462,000	2,335,000
Total Canal Cost				5,453,000	6,988,000	12,441,000
3. On-farm Works	ha	574		628,000	936,000	1,564,000
4. Agricultural Development						
(1) Sericulture						
Earth work	cu.m	1,880	25	14,000	33,000	47,000
Working house	place	2	170,000	170,000	170,000	340,000
Facilities	L.S			77,000	-	77,000
Sub - total				261,000	203,000	464,000
(2) Livestock						
Earth work	cu.m	21,240	25	159,000	372,000	531,000
Working house	place	1	170,000	85,000	85,000	170,000
Facilities	L.S			15,000	5,000	20,000
Sub - total				259,000	462,000	721,000
(3) Inland Fisheries						
Earth work	cu.m	2,210	100	66,000	155,000	221,000
Structures	L.S			8,000	5,000	13,000
Sub - total				74,000	160,000	234,000
Total				594,000	825,000	1,419,000
5. Rural Road						
Standard road	km	22.0	515,000	5,412,000	5,918,000	11,330,000
Bridge	L.S			1,878,000	1,348,000	3,226,000
I block pavement	km	5.0	1,516,000	3,760,000	3,820,000	7,580,000
Service road (I)	km	8.0	355,000	1,392,000	1,448,000	2,840,000
Service road (II)	km	3.0	288,000	432,000	432,000	864,000
Total				12,874,000	12,966,000	25,840,000
6. Rural Water Supply						
Deep well	place	7	64,700	167,720	285,180	452,900
7. Cottage Industry						
(1) Silk weaving	place	1	270	216,000	54,000	270,000
(2) Bamboo handicraft	place	1	245	196,000	49,000	245,000
(3) Jewel polishing	place	-	-	-	-	-
Total				412,000	103,000	515,000
8. Building						
(1) Project Office	sq.m	200	300,000	300,000	300,000	600,000
(2) Training Center						
House	sq.m	144	2,000	144,000	144,000	288,000
Facilities	L.S			60,000	110,000	170,000
Outdoor works	L.S			202,000	-	202,000
Fixtures	L.S			10,000	10,000	20,000
Sub - total				416,000	264,000	680,000
Total				716,000	564,000	1,280,000
9. Training Equipment				80,000	420,000	500,000
10. Land Acquisition	ha	24	25,000	600,000	-	600,000
11. Survey and Investigation	L.S			3,337,000	-	3,337,000
12. Administration	L.S			6,847,000	-	6,847,000
13. Consulting Services				2,005,000	17,299,000	19,304,000

TABLE H-7 COST ESTIMATE OF MODEL PROJECT
- KHLONG SAMO KHON -

Description	Unit	Q'ty	Unit Price (฿)	Cost (฿) L/C	Cost (฿) F/C	Cost (฿) Total
1. Dam						
(1) Dam Body						
Stripping	cu.m	22,532	10	67,596	157,724	255,320
Trench excavation	cu.m	23,833	32	190,664	571,992	762,656
Grouting	m	-	1,800	-	-	-
Embankment	cu.m	137,750	50	1,928,500	4,959,000	6,887,500
Vertical drain	cu.m	1,968	200	275,520	118,080	393,600
Horizontal drain	cu.m	1,500	200	210,000	90,000	300,000
Riprap filter	cu.m	3,625	410	1,040,375	445,875	1,486,250
Riprap	cu.m	8,156	410	2,340,772	1,003,188	3,343,960
Toe rock	cu.m	2,414	1,150	1,943,270	832,830	2,776,100
Sodding	sq.m	14,872	23	342,056	-	342,056
Outlet (ø800 mm)	L.S			2,136,900	4,986,100	7,123,000
Miscellaneous	L.S			1,047,565	1,316,479	2,364,044
Sub - total				11,523,218	14,481,268	26,004,486
(2) Spillway						
Rock excavation	cu.m	5,249	141	199,477	540,688	740,165
Earth excavation	cu.m	12,249	32	97,989	293,966	391,955
Concrete works	cu.m	1,954	4,390	4,718,910	3,859,150	8,578,060
Backfill	cu.m	5,570	50	139,250	139,250	278,500
Miscellaneous (10%)	L.S			516,156	463,678	979,834
Sub - total				5,671,782	5,296,732	10,968,514
Total Dam Cost				17,195,000	19,778,00	36,973,000
2. Canal						
(1) Main Canal	km	8.95				
Stripping	cu.m	39,861	10	199,583	279,027	398,610
Excavation	cu.m	2,273	32	,18,184	54,552	72,736
Embankment	cu.m	18,974	50	265,636	683,064	948,700
Concrete works	cu.m	1,038	2,200	1,255,980	1,027,620	2,283,600
Laterite	cu.m	7,160	133	744,640	207,640	952,280
Structure	L.S			302,520	705,880	1,008,400
Miscellaneous works	L.S			111,457	121,217	232,674
Sub - total				2,818,000	3,079,000	5,897,000
(2) Lateral Canal	km	3.1		606,000	790,000	1,396,000
Total Canal Cost				3,424,000	3,869,000	7,293,000
3. On-farm Works	ha	179		196,000	292,000	488,000
4. Agricultural Development						
(1) Sericulture						
Earth work	cu.m	1,880	25	14,000	33,000	47,000
Working house	place	1		85,000	85,000	170,000
Facilities	L.S			85,000	-	85,000
Sub - total				184,000	118,000	302,000
(2) Livestock						
Earth work	cu.m	-	25	-	-	-
Working house	place	-	170,000	-	-	-
Facilities	L.S	-		-	-	-
Sub - total				-	-	-
(3) Inland Fisheries						
Earth work	cu.m	3,630	100	106,000	257,000	363,000
Structures	L.S			8,000	5,000	13,000
Sub - total				114,000	262,000	376,000
Total				298,000	380,000	678,000
5. Rural Road						
Standard road	km	-	515,000	-	-	-
I block pavement	km	1.0	1,516,000	752,000	764,000	1,516,000
Service road (I)	km	-	355,000	-	-	-
Service road (II)	km	1.0	288,000	106,000	257,000	363,000
Total				858,000	1,021,000	1,879,000
6. Rural Water Supply						
Deep well	place	4	64,700	95,840	162,960	258,800
7. Cottage Industry						
(1) Silk weaving	place	1	270	216,000	54,000	270,000
(2) Bamboo handicraft	place	-	-	-	-	-
(3) Jewel polishing	place	-	-	-	-	-
Total				216,000	54,000	270,000
8. Building						
(1) Project Office	sq.m	200	300,000	300,000	300,000	600,000
(2) Training Center						
House	sq.m	144	2,000	144,000	144,000	288,000
Facilities	L.S			60,000	110,000	170,000
Outdoor works	L.S			202,000	-	202,000
Fixtures	L.S			10,000	10,000	20,000
Sub - total				416,000	264,000	680,000
Total				716,000	564,000	1,280,000
9. Training Equipment				80,000	420,000	500,000
10. Land Acquisition	ha	19	25,000	475,000	-	475,000
11. Survey and Investigation	L.S			3,684,00	-	3,684,000
12. Administration	L.S			2,904,000	-	2,904,000
13. Consulting Services				1,022,000	8,833,000	9,855,000

TABLE H-7 COST ESTIMATE OF MODEL PROJECT
- KHLONG SAI -

Description	Unit	Q'ty	Unit Price (฿)	Cost (฿)		
				L/C	F/C	Total
1. Dam						
(1) Dam Body						
Stripping	cu.m	26,058	10	78,174	182,406	260,580
Trench excavation	cu.m	10,887	32	87,096	216,288	348,384
Grouting	m	-	1,800	-	-	-
Embankment	cu.m	181,225	50	2,537,150	6,524,100	9,061,250
Vertical drain	cu.m	3,675	200	514,500	220,500	735,000
Horizontal drain	cu.m	4,350	200	609,000	261,000	870,000
Riprap filter	cu.m	3,671	410	1,053,577	451,533	1,505,110
Riprap	cu.m	8,260	410	2,370,620	1,015,980	3,386,600
Toe rock	cu.m	8,662	1,150	6,972,910	2,988,390	9,961,300
Sodding	sq.m	16,670	23	383,410	-	383,410
Outlet (ø800 mm)	L.S			2,155,050	5,028,450	7,183,500
Miscellaneous	L.S			2,035,148	2,638,954	4,674,102
Sub - total				18,796,635	19,572,601	38,369,236
(2) Spillway						
Rock excavation	cu.m	6,039	141	229,482	622,017	851,499
Earth excavation	cu.m	14,091	32	112,728	338,184	450,912
Concrete works	cu.m	3,609	4,390	8,715,735	7,127,775	15,843,510
Backfill	cu.m	4,350	50	108,750	108,750	217,500
Miscellaneous (10%)	L.S			916,670	819,673	1,736,343
Sub - total				10,083,365	9,016,399	19,099,764
Total Dam Cost				28,880,000	28,589,000	57,469,000
2. Canal						
(1) Main Canal	km	9.90				
Stripping	cu.m	45,086	10	135,258	315,602	450,860
Excavation	cu.m	3,199	32	25,592	76,776	102,368
Embankment	cu.m	22,608	50	316,512	813,888	1,130,400
Concrete works	cu.m	1,259	2,200	1,523,390	1,246,410	2,769,800
Laterite	cu.m	7,920	133	823,680	229,680	1,053,360
Structure	L.S			590,280	1,377,320	1,967,600
Miscellaneous works	L.S			141,288	134,324	275,612
Sub - total				3,556,000	4,194,000	7,750,000
(2) Lateral Canal	km	9.63		1,791,000	2,284,000	4,075,000
Total Canal Cost				5,347,000	6,478,000	11,825,000
3. On-farm Works	ha	390		426,000	636,000	1,062,000
4. Agricultural Development						
(1) Sericulture						
Earth work	cu.m	5,680	25	43,000	99,000	142,000
Working house	place	3	170,000	255,000	255,000	510,000
Facilities	L.S			254,000	-	254,000
Sub - total				552,000	354,000	906,000
(2) Livestock						
Earth work	cu.m	21,240	25	159,000	372,000	531,000
Working house	place	1	170,000	85,000	85,000	170,000
Facilities	L.S			15,000	5,000	20,000
Sub - total				259,000	462,000	721,000
(3) Inland Fisheries						
Earth work	cu.m	6,410	100	187,000	454,000	641,000
Structures	L.S			8,000	5,000	13,000
Sub - total				195,000	459,000	654,000
Total				1,006,000	1,275,000	2,281,000
5. Rural Road						
Standard road	km	-	515,000	-	-	-
I block pavement	km	-	1,516,000	-	-	-
Service road (I)	km	-	355,000	-	-	-
Service road (II)	km	0.9	288,000	130,000	130,000	260,000
Total				130,000	130,000	260,000
6. Rural Water Supply						
Deep well	place	6	64,700	143,760	244,440	388,200
7. Cottage Industry						
(1) Silk weaving	place	1	270	216,000	54,000	270,000
(2) Bamboo handicraft	place	-	-	-	-	-
(3) Jewel polishing	place	1	450	360,000	90,000	450,000
Total				576,000	144,000	720,000
8. Building						
(1) Project Office	sq.m	200	300,000	300,000	300,000	600,000
(2) Training Center						
House	sq.m	144	2,000	144,000	144,000	288,000
Facilities	L.S			60,000	110,000	170,000
Outdoor works	L.S			202,000	-	202,000
Fixtures	L.S			10,000	10,000	20,000
Sub - total				416,000	264,000	680,000
Total				716,000	564,000	1,280,000
9. Training Equipment				80,000	420,000	500,000
10. Land Acquisition	ha	33	25,000	825,000	-	825,000
11. Survey and Investigation	L.S			3,805,000	-	3,805,000
12. Administration	L.S			4,430,000	-	4,430,000
13. Consulting Services				1,587,000	13,693,000	15,280,000

TABLE H-8 CONSTRUCTION EQUIPMENT

(1) Large Size Percussion Drilling Equipment

- 3 sets, 40 holes/set/year -

Item	Equipment	Q'ty	Price (฿1,000) L.C	F.C	Total
1	Towed-type percussion drilling rig 1.2 ft w/truck 12 ton type 6 × 6 and hand tools for drilling	3	7,200	24,000	31,200
2	Flatbed truck 6 ton w/boom and deep well development machine	3	1,200	3,000	4,200
3	Flatbed truck w/air compressors 250 CFM	3	1,470	3,660	5,130
4	Flatbed truck 6 ton, 6 wheel	3	700	1,740	2,440
5	Pickup 4 × 4, diesel	3	880	1,470	2,350
6	Air jack 50 ton	6	600	1,500	2,100
7	Water tank trailer(1,500ℓ) w/water pump (2")	3	60	150	210
8	Engine arc welder (200 A) w/generator (3 kw)	3	160	390	550
9	Hand tool for equipment service	3	100	240	340
10	Single side hand transceiver (100W)	3	110	270	380
	Total		12,480	36,420	48,900

(2) Road Maintenance Equipment

- 1 set, 150 km/year -

Item	Equipment	Q'ty	Price (฿1,000) L.C	F.C	Total
1	Motor grader (125 HP)	1	780	2,600	3,380
2	Self-propelled roller (11 wheel)	1	800	2,000	2,800
3	Water truck 6 ton, 6 wheel (6,000ℓ)	2	260	650	910
4	Dump truck 6 ton, 6 wheel (4.5 cu.m)	1	260	650	910
5	Flatbed truck 6 ton, 6 wheel	1	230	580	810
6	Pick up 1 ton	2	100	260	360
7	Mobile shop truck 4 ton	1	260	650	910
8	Plate compactor	2	20	60	80
9	Water pump w/trailer (3")	2	10	30	40
10	Generator (5 kw)	1	20	60	80
	Total		2,740	7,540	10,280

(3) Reservoir Construction Equipment

- 1 set -

Item	Equipment	Q'ty	Price (฿ 1,000) L.C	F.C	Total
1	Bulldozer w/ripper (150 ~ 200 HP)	1	1,500	5,000	6,500
2	Bulldozer (100 ~ 150 HP)	2	1,800	6,000	7,800
3	Swap type bulldozer (100 ~ 150 HP)	1	1,050	3,500	4,550
4	Motor scraper (11 cu. yard)	2	3,300	11,000	4,300
5	Motor grader (125 HP)	2	1,560	5,200	6,760
6	Hydraulic excavator (0.7 cu.m)	3	1,980	6,600	8,580
7	Dragline (0.7 cu.m)	1	900	3,000	3,900
8	Self-propelled sheep foot compactor	3	1,980	6,600	8,580
9	Self propelled roller compactor	1	800	2,000	2,800
10	Wheel loader (1.2 cu.m)	1	720	1,800	2,520
11	Dump truck (4.5 cu.m)	10	2,600	6,500	9,100
12	Water truck (6,000 ℓ)	3	780	1,950	2,730
13	Fuel truck (6,000 ℓ)	1	270	680	950
14	Fuel tank trailer (6,000 ℓ)	2	120	300	420
15	Truck w/lubricating unit	1	320	800	1,120
16	Flatbed truck	1	230	580	810
17	Pick up truck (1 ton)	2	210	520	730
18	Flatbed truck w/3 ton crane	1	410	1,030	1,440
19	Shop trailer	1	120	300	420
20	Truck tractor w/30 ton trailer	1	1,400	3,500	4,900
21	Warehouse trailer (5 ton)	1	120	300	420
22	Water pump /trailer (4")	2	40	100	140
23	Hand tool for equipment service	1	30	80	110
24	Hand tool for construction	1	10	30	40
25	Generator (30 kw)	1	160	400	560
26	Engine arc welder (200 A)	1	50	130	180
27	Plate compactor	3	10	30	40
28	Concrete mixer (7 cu.f)	1	20	50	70
29	Concrete vibrator (3 HP)	4	40	100	140
30	Single side band transceiver (100 W)	1	40	90	130
	Total		22,570	68,170	90,740

TABLE H-9 TRAINING EQUIPMENT FOR FOC

Description	Unit	Q'ty	Rice (฿)
(F/C)			
White Board with Screen	set	1	18,500
Overhead Projector	set	1	34,200
Amplifier, Speaker, Microphone	set	1	27,300
Sub-total			80,000
Video Tape Recording Kit	set	1	
- Video Camera			298,000
- Portable Video Cassette Recorder			189,000
- Tripod			79,500
- Portable Battery Light			36,700
- Battery			23,600
- Battery Charger			16,500
- Cable			5,700
Sub-total			649,000
Video TV Kit	set	1	
- Color Monitor TV			61,100
- Video Cassette Player			128,000
- Video Projector			307,000
- Screen			82,700
- Remote Control Unit			18,900
- Cable			10,300
Sub-total			608,000
Total			1,337,000
(L/C)			
Duty, Tax and Others			313,000
Grand Total			1,650,000

TABLE H-10 CONSULTING SERVICES FOR MODEL PROJECT

(1) Detail Design

1. Foreign Currency Component	(Yen)	
(1) Remuneration		
- Foreign Consultants (35m/m)	77,000,000	
- Local Consultants (50m/m)	33,600,000	
(2) Allowance for Foreign Personnel	3,318,000	
(3) Out-of- Pocket Expense	2,212,000	
(4) Unallocated Contingencies(3%)	3,484,000	
Total	119,614,000	(฿21,748,000)
2. Local Currency Component	(Baht)	
(1) Allowance for Local Personnel	84,000	
(2) Local Communication	240,000	
(3) Local Transportation	502,000	
(4) Salaries for Supporting Staff	264,000	
(5) Losts for Printing	240,000	
(6) Unallocated Contingencies (3%)	65,000	
Total (2)	1,395,000	
Total (1+2)	฿23,143,000	
(2) *Supervision*		
1. Foreign Currency Component	(Yen)	
(1) Remuneration		
- Foreign Consultants (40m/m)	88,000,000	
- Local Consultants (100m/m)	67,200,000	
(2) Allowance for Foreign Personnel	4,656,000	
(3) Out-of-Pocket Expense	3,104,000	
(4) Unallocated Contingencies(3%)	4,889,000	
Total (3)	167,849,000	(฿30,518,000)
2. Local Currency Portion	(Baht)	
(1) Allowance for Local Personnel	1,680,000	
(2) Local Communication	768,000	
(3) Local Transportation	380,000	
(4) Salaries for Supporting Staff	844,000	
(5) Costs for Printing	768,000	
(6) Unallocated Contingencies	220,000	
Total (4)	4,660,000	
Total (3+4)	฿35,178,000	
Grand Total	฿58,321,000	

APPENDIX I. PROJECT EVALUATION

C O N T E N T S

LIST OF TABLES

I-1 GENERAL ECONOMY

I-1-1 Overview of Thai Economy

In 1989, the Thai economy continued to expand at a high rate for the third consecutive year following the recovery in 1987 and the markedly high growth rate of 12 percent in 1988. The growth rate for the year decelerated slightly to register 10.8 percent. The economic expansion resulted largely from demand side factors, namely, the marked increase in demand for investment, exports, and consumption of both the public and private sectors, and the large influx of foreign investment. On the supply side, production was almost at full capacity and thus output growth lagged behind demand. Agricultural production, while encouraged by favourable prices, grew at a slower rate due to not so favourable climatic conditions as in the previous year. The imbalance between aggregated demand and output resulted in rapid increases in prices of many items. The consumer price index, as a result, rose by 5.4 percent, on the average, compared with the 3.8 percent increase in the previous year. The index is expected to continue an upward trend in line with other costs of production, especially the cost of labour and imported raw materials, which began to rise, together with the increased purchasing power derived from the speculation in land, immovable properties, and securities.

The continued rapid economic growth induced increased imports of capital goods, raw materials, and oil, in order to satisfy the expanding domestic production. The trade account, as a result, registered a larger deficit of 130,000 million Bahts this year, with the deficit expected to show an upward trend for the near future. Nevertheless, the large trade deficit did not bear any significant impact on the country's external stability, as had been the case in earlier years, because of the increased income from tourism, together with the large amount of capital flows. The balance of payment continued to record a surplus of 111,450 million Bahts, and international reserves at the end of December rose to over 10 billion US dollars, or equivalent to 5 months of imports.

Commercial bank credit extension continued to grow at a high rate throughout the year. On the deposit side, commercial bank deposits also grew at an accelerated rate this year due to the record amount of net

private capital inflows, and the effect of allowing the interest rate on deposits with maturity over one year to float. As a result, liquidity in the financial system was already eased compared with the condition prevailing at the end of the previous year.

In 1989, the Government's fiscal position continued to improve from the previous fiscal year. The Government's cash balance registered a surplus of 59,652 million Bahts, almost doubled that of the previous fiscal year. This was due to the rise in the government revenue collection in line with the economic expansion and the increased business income as well as income of the general public, while budgetary disbursement expanded at a slow rate.

On the general economic policy, the authorities continued to implement measures to enhance the economic growth and distribute development to the rural areas. In addition, the authorities had begun to implement policy measures to correct the imbalance between the demand and domestic supply, which included fiscal measures, monetary ones, price ones, measures to improve important procedures, and measures to reduce speculation in land and securities.

I-1-2 General Framework of 7th NESDP

(1) General Description

On August 6, 1990, a special cabinet meeting was held to scrutinize Thailand's development guidelines as related to framework of the Seventh Economic and Social Development Plan (1992 - 1996) which will be effective from 1st October 1991 onwards. The meeting, presided by Prime Minister, comprised the Councils of Economic and Social Ministers, National Economic and Social Development Committee (NESDC), and Permanent Secretaries of all ministries concerned.

The meeting discussed and gave opinions widely towards framework of the Seventh Plan. Approval was given to its development principles under three major development objectives. The first objective is to sustain economic expansion at an appropriate level with continuity and stability. The second one aims to distribute income and decentralize development prosperity to the regions. And, the last one emphasizes development of life quality and conservation of natural resources and environment.

(2) Overall Economic and Social Scenarios and Development Targets

In order to formulate the Seventh Plan, consideration should be given to study and analysis on the tendency of overall economic and social scenarios in the Seventh Plan period. In so doing, it needs to take into account past development results, opportunities, constraints, and uncertainties in the world economy which would affect the Thai economy during the Seventh Plan period. As a consequence, emerging issues were derived leading to set major objectives and targets for development of Thailand in future.

During the first three years of the Sixth Plan (1987 - 1989), the Thai economy averagely expanded by 11.7 percent per annum, higher than the projected 5 percent growth rate of the Sixth Plan. Economic, financial and monetary stability was kept at an appropriate level. Proportion of debt service ratio gradually reduced from 31 percent in 1986 to 17 percent in 1989. The government's fiscal position has achieved balance since 1988. Besides, past development has shifted Thailand's economic structure from agricultural to industrial base. Production proportion of manufacturing has markedly augmented to 25.6 percent of GDP in 1989, while that of agriculture abated to merely 15.1 percent.

Social structure has also changed because of the country's population growth rate decreasing substantially to only 1.56 percent in 1989. Main results of social changes can be witnessed by the facts that the proportion of teen-agers and adults, together with elderly, will rise sharply whereas that of the children will be reversed. Consequently, the Thai family size will become smaller, thus triggering more single families in the Thai society.

The remarkable economic growth rate during the first three years of the Sixth Plan has emitted some critical problems, thus obstructing future economic expansion. For instance, the country's competitiveness in term of production inputs have started decreasing. Meanwhile, basic services have become insufficient, and inflation has been soaring. This includes deterioration of natural resources and environment and the chronic problem of income distribution to the rural poor.

Despite such constraints, opportunity for economic prosperity in years ahead still remain. There is still a good opportunity for export expansion, while opportunities for expanding manufacturing production, as well as increasing purchasing power for goods and services are available in the Thai domestic market. To formulate the Seventh Plan, however, it needs to consider uncertainties of the world economy in order to have prudent preparedness for any fluctuations that might be occurred. In particular, special emphasis will be placed on uncertainties in terms of oil prices, prices of agricultural outputs, exchange rate, interest rate, as well as economic and trade policies of major economic groups.

Under the three development objectives stated above, major development targets during the Seventh Plan period have been formulated. In particular, the overall economic growth rate is set to be 9 percent annually on average. Per capita income of the country is set to increase from 32,400 Baht in 1989 to 75,000 Baht in the final year of the Plan, and inflation will not exceed 5.5 percent per annum. Average trade deficit must not be higher than 7 percent of GDP, while that of the current account should achieve balance by the end of the Seventh Plan.

As for income distribution targets, fairer distribution of income will be created for poor agricultural workers and employees, small-scale self-employed workers in the cities, and low-income private workers. Meanwhile, it is desirable to bridge income disparities among people in different geographical regions, and in different occupational groups. Property ownership, particularly land holdings, should be dispersed more

to agricultural workers.

With regard to quality of life and environment, the Seventh Plan aims to reduce the population growth rate of the country to 1.2 percent in 1996. Transitional rate of students from elementary to secondary education must increase from 45 percent of students completed compulsory education to 60 percent by the end of the Plan. About environmental issues, it was endorsed to reduce volumes of water and air pollutions, solid wastes, and toxic elements. Special emphasis needs to be placed on reduction of toxic elements in the air, such as Sulfur Dioxide, Carbonmonoxide, Nitrogen Dioxide and lead in gasoline etc.

(3) Policies to Sustain Economic Growth and Stability

During the Seventh Plan period, economic system of Thailand will widely open towards international scene, thus needing to increase production efficiency so as to maintain the country's competitiveness in the world market. This include strategies to simultaneously decentralize production sources to new economic zones in regional areas. Moreover, it needs to adjust various economic policies relevant to production, trade and basic service provision to ensure more flexibility in order that the Thai economy will grow substantially high with reasonable stability.

In order to sustain economic growth and stability during the Seventh Plan period, it aims to adjust production structure of agriculture, industry, services and trade. Problems attributable to constraints of basic services and energy will be solved. In addition, the Seventh Plan will focus on the development of science, technology, fiscal, monetary and capital market of the country. On this matter, 9 major policies will be carried out in order to achieve the target as to sustain economic growth at 9 percent per annum. Agriculture is set to grow at least 2.7 percent per year, industry is set to expand not less than 9.3 percent annually, and export will increase at least 17 percent per annum. With expansion of these sectors, the Thai economy will grow with favourable stability. Deficit of trade and current account balances will be kept not higher than 7 percent and 2 percent of GDP, respectively; while the inflation is set at 5.5 percent per annum.

These 9 major policies comprise agricultural development policy, industrial development policy, trade development policy, service development policy, infrastructure development policy, energy development policy, development policy for science and technology, development policy for new economic zones, and development policy for fiscal, monetary and capital market.

In order to sustain economic growth with financial stability, diversification of trade and production structures need to keep implementing. Fiscal and monetary policies will be managed with flexibility and with less restrictions, together with the development of capital market that will favor investment climate. Policies should be widely geared towards opening of the Thai economy into international scene. This includes an creation of competitive economic atmosphere, by means of reducing monopolies and protectionism in the Thai domestic market. Meanwhile, it needs to tackle problems of constraints hindering economic expansion, increase Thailand's production efficiency and competitiveness, and develop science and technology. Furthermore, it needs to prudently control inflation rate, trade deficit, current account deficit, and foreign debt to the level conducive to economic stability. More so, private sector will be encouraged to participate in national development.

(4) Directions and Policy Guidelines for Income Distribution

With regard to guidelines for income distribution, the Seventh Plan aims to bridge income disparities among household groups, different occupational groups, and different geographical regions, particularly Bangkok Metropolitan Region and regional areas.

The present situation of income distribution is unfavorable, and disparities of economic property holdings and income have become widen, and agriculturists are still the poorest occupational group. The Seventh Plan therefore has set directions and policy guidelines for income distribution, comprising policies in seven major issues. These policies are, namely, fiscal and monetary policy which will lead to fairer income distribution, a policy to disperse property holdings to provide insurances in terms of housing and farm land to underprivileged people, a policy to develop human resources, an adjustment policy for production and marketing system, a policy to disperse social and economic services to the regions, a policy to alleviate rural poverty, and a policy to tackle problems of the urban poor.

In regard to policy and measures for income distribution, the Seventh Plan will underline adjustment of major policies to solve problems relevant to production, marketing, and pricing policy for poor

agriculturists. This has to be done simultaneous with decentralization of production activities, especially selected industries to regional areas. Besides, emphasis will be placed on policies as to raise income and wages, development of human resources in terms of education and public health among underprivileged groups of people, an increase of basic services, more provision of public welfares, and dispersion of property ownership. People's organization at tambon and village levels, in particular, will be encouraged to help alleviate income disparities.

Important measures in the Seventh Plan to achieve the targets on income distribution are, namely, a measure to include land development tax, house and rent tax into "property tax", generating revenue to local areas, and inheritance tax will become enforced. In addition, royalty fees and revenues derived from electricity generating using natural resources in each area should be yielded to local areas. Tax measures are suggested to reduce land speculations, and increase budget as to develop education and health services in remote rural areas and congested communities in the cities.

Besides, there were suggestions to raise fund to purchase land and houses for low-income people, and opportunities should be given to low-profile employees to hold shares of companies or state enterprises to be listed in Stock Exchange of Thailand. Guarantees of land and houses will be provided for underprivileged people and agricultural workers, by accelerating land reform, and enforcing law on rental land for agricultural purposes. This will include housing provision for low-income people, by offering fairer rental fees etc. Moreover, the Seventh Plan will take into account the policies to tackle problems of urban poverty, which will substantially increase, due to rural migration. Meanwhile, promotion will be given to small-scale self-employed workers and vendors in specific locations. Supports will be given to these workers in terms of revolving funds and credits. In addition, the Seventh Plan will promote sub-contract system, take-home contract, and provision of necessary information for small-scale self-employed workers in congested communities in urban areas.

(5) Development of Life Quality, Environment and Natural Resources

During the Seventh Plan period, it is necessary to adjust social, environmental and natural resources policies to ensure flexibility and balance in national development which will lead to better living for people in society. These development policies will enable Thai population to adjust themselves consistent with changes of society, economy and technology so as to improve their life quality.

Presently, Thai society is now transforming from rural to urban society, thus causing noticeable impact on the people's way of life. In particular, in the Seventh Plan, it is expected that the population's quality of life will be affected by the social and economic changes in various aspects. To alleviate these impacts, the Seventh Plan has drawn up 5 policies for development of life quality, environment and natural resources. These policies are, namely, an educational policy, a public health policy, a policy for social, spiritual and cultural development, an environmental development policy, and a development policy for natural resources.

As a consequence, development of life quality will stress an increase of competency of population in all ages so that they will be able to appropriately adjust themselves both physical and mental abilities, compatible with the current changes of economy, society and technology. Measures and system to ensure security of family institution are also greatly needed, including measures to encourage private sector and community organizations to establish centres to look after children and elder people in both urban and rural areas. Moreover, importance is necessary for undertakings to maintain safety in life and property, as well as provision of peace in society. In so doing, crimes due to tycoons in local areas should be suppressed intensively and continuously. At the same time, morality and cultures will be developed, by setting government mechanism to coordinate and support activities of monasteries, schools, communities, and religious organizations to participate in spiritual development.

In relation to environment and natural resources, the Seventh Plan will strictly enforce pollution control, together with the setting of administrative and management system for pollution of water and air, solid wastes and toxic substances, including deterioration of natural resources. In so doing, it will help control toxic substances at the level not harmful to health, and strict measures will be made on utilization of coal in production process so as to prevent occurrence of acid rain to the level that would be hazardous for land and water resources, forest and community.

I-2 Agro-Socio-Economic Survey

I-2-1 Necessary Arrangement

In order to grasp more detailed information on the agro-socio economic condition of rural villages and farmers in the Study Area, especially, in the Model Project Areas, an interview survey has been carried out with cooperation of ARD's counterparts. The survey method including preparation of survey format and data processing was principally based on "FARMAP" (Farm Analysis Package) which had been developed by the Farm Management and Production Economics Services (AGSP) of the Food and Agriculture Organization (FAO).

In the last part of Phase I survey, after selection of the Model Areas, probable beneficial villages were identified on the basis of 1/50,000 topographic maps. The followings are summary of the firstly selected villages to be surveyed.

List of Villages to be Surveyed

Province	Related Amphoe	Related Tambol	No. of Village
Phitsanulok	Nakhon Thai	Ban Yaeng	1
		Nong Kra Taw	5
Sukhothai	Ban Dan Lan Hoi	Wang Nam Khaw	7
Kamphaeng Phet	Phran Kratai	Tha Mai	2
		Nong Hua Woa	1
		Wang Khuang	4
Tak	Muang Tak	Chieng Tong	4
Total			24

Out of 24 villages identified above, 11 are under category of the backward village.

I-2-2 Interview Survey

Tentatively, 64 samples were allocated to each Province/Model Project Area, and interview survey was carried out by ARD counterparts during the transition period between the Phase I and Phase II. In

accordance with local conditions such as accessibility and village profile, finally total 257 of sample farmers were surveyed as shown in Table I-2-1.

I-2-3 Data Entry and Data Processing

Due to lack of enough information on the data processing computer programs in the FARMAP such as user's manual, data entry works have been completed during the field work in the Phase II. In connection with data entry, staff of Computer Sub-Division, Research and Evaluation Division is in charge by using IBM microcomputer with software named "ENTERD" in FARMAP.

The works on data processing including correction and validation were carried out by using FARMAP's software, namely "MODCON" and "CROSST". The results are summarized in Table I-2-2 through I-2-16.

TABLE I-2-1 GENERAL INFORMATION ON SAMPLED VILLAGES

Name of Village	Number of Household					Population			Number of Sampled Farmer
	Farmer	Commerce	Employee	Others	Total	Male	Female	Total	
Huai Sam Ru (Phitsanulok)									
- Sam Lu *	110	2	50	2	164	379	367	746	7
- Kaeng Wa *	237	2	6	-	245	506	531	1,037	12
- Kaeng Hai *	93	2	-	-	95	194	205	399	12
- Non Tha Phon *	50	-	10	5	65	161	104	265	13
- Nam Tak *	84	-	4	-	88	221	227	448	8
- Bung *	118	-	2	1	121	268	327	595	12
Total	692	6	72	8	778	1,729	1,761	3,490	64
Huai Nong Kho (Sukhothai)									
- Wang Phomg *	57	1	3	-	61	122	116	238	5
- Huai Krai	273	3	5	-	281	763	705	1,468	23
- Lan Thong - Khok Khwai * - Khao Khwang - Nong Sano	134	2	3	-	139	282	266	548	13
- Phu Thong - Wang Ta Kein	251	-	20	-	271	716	526	1,342	23
Total	715	6	31	-	752	1,883	1,613	3,596	64
Khlong Samo Khon (Kamphaeng Phet)									
- Samo Khon *	97	-	30	-	135	240	235	475	16
- Nam Dip Ma Praw *	124	5	10	-	139	259	289	548	15
- Wang Khuang	109	7	20	-	136	369	398	767	9
- Na Nok *	88	3	3	-	94	169	175	344	17
- Lan Sadaw *	63	4	7	-	74	149	249	398	8
Total	481	19	70	-	578	1,186	1,346	2,532	65
Khlong Sai (Tak)									
- Wang Tamlung *	50	-	-	-	50	243	256	499	27
- Na Bot	260	-	58	-	318	783	811	1,594	16
- Lat Yaw	157	-	40	-	187	565	470	1,035	10
- Takhiang Ngam	63	-	12	-	75	135	173	308	11
Total	530	-	110	-	630	1,726	1,710	3,436	64

Note: * Backward Villages

TABLE I-2-2 : HOUSEHOLD STRUCTURE OF FARMS BY GROUP AVERAGES

GROUP COMPOSITION	MODEL PROJECT AREAS HUAI SAM RU (PSN)	HUAI NONG KHO (SKT)	KHLONG SAMO KHON (KPP)	KHLONG SAI (TAK)	GRAND TOTAL
No. of Farms	64.0	64.0	65.0	64.0	257.0
No. of Members	301.0	321.0	306.0	399.0	1327.0
Household Size	4.7	5.0	4.7	6.2	5.2
SEX COMPOSITION (%)					
Male	51.5	48.3	52.9	50.1	50.6
Female	48.5	51.7	47.1	49.9	49.4
Total	100.0	100.0	100.0	100.0	100.0
AGE COMPOSISITON (%)					
1 TO 10 Years	20.9	17.1	13.1	29.3	20.7
11 TO 15 Years	8.3	10.6	10.8	13.0	10.9
16 TO 20 Years	10.0	13.4	16.0	11.3	12.6
21 TO 60 Years	57.1	53.0	55.9	43.6	51.8
61 TO 65 Years	2.0	1.9	2.0	1.0	1.7
Above 66 Years	1.7	4.0	2.3	1.8	2.4
Total	100.0	100.0	100.0	100.0	100.0
Ave. Age of Head of Household (Yrs.)	45.3	48.9	46.3	42.4	45.7
FARM LABOUR STATUS (%)					
Total Available	71.8	70.4	75.2	58.4	68.2
- Full Time	57.5	62.0	58.8	50.1	56.7
- Part Time	14.3	8.4	16.3	8.3	11.5
Not Active	28.2	29.6	24.8	41.6	31.8
Total	100.0	100.0	100.0	100.0	100.0
STATUS OF LITERACY (%)					
Read Only	4.7	3.7	.3	1.8	2.6
Literacy	77.1	81.3	91.2	62.9	77.1
Illiteracy	18.3	15.0	8.5	35.3	20.3
Total	100.0	100.0	100.0	100.0	100.0
STATUS OF RELIGION (%)					
Buddhism	100.0	100.0	100.0	86.0	95.8
Islam	.0	.0	.0	.0	.0
Christian	.0	.0	.0	14.0	4.2
Others	.0	.0	.0	.0	.0
Total	100.0	100.0	100.0	100.0	100.0

TABLE I-2-3 : EDUCATION LEVEL OF FARM HOUSEHOLD MEMBERS

GROUP COMPOSITION	MODEL PROJECT AREAS HUAI SAM RU (PSN)	HUAI NONG KHO (SKT)	KHLONG SAMO KHON (KPP)	KHLONG SAI (TAK)	GRAND TOTAL
SCHOOL GRADE ATTENDED (%) (6 - 20 years)					
Primary level	40.0	43.9	34.0	49.1	42.6
Secondary level					
- General	6.3	1.9	3.8	7.5	5.1
- Vocational	1.1	.0	.0	1.9	.9
Higher vocation.	.0	.0	.0	.6	.2
Teacher training	.0	.0	.0	.0	.0
University	.0	.0	.0	.0	.0
Other level	.0	.0	.0	.0	.0
Unknown *1	48.4	52.3	60.4	37.9	48.4
Child	4.2	1.9	1.9	3.1	2.8
Total	100.0	100.0	100.0	100.0	100.0
EDUCATION COMPLETED (%) (10 years and over)					
None	10.6	6.6	3.6	32.0	13.2
Lower pathom 4	9.3	7.5	5.7	3.3	6.4
Primary/equiv.	71.7	81.7	88.3	57.7	75.0
Secondary or equivalent					
- Lower	3.5	3.3	2.0	4.1	3.2
- Upper	1.8	.8	.0	.8	.8
Diploma/equiv.	2.2	.0	.4	1.2	.9
Bachelor/higher	.9	.0	.0	.8	.4
Others	.0	.0	.0	.0	.0
Total	100.0	100.0	100.0	100.0	100.0
LITERACY STATUS (%) (10 years and over)					
Illiterate	8.4	5.1	2.9	25.3	10.8
Read Ability	5.2	3.7	.4	2.0	2.7
Literate	86.3	91.2	96.7	72.7	86.4
Total	100.0	100.0	100.0	100.0	100.0

Note: *1 including numbers of education completed.

TABLE I-2-4 : MIGRATION OF HOUSEHOLD HEAD BY PLACE AND REASON

GROUP COMPOSITION	MODEL PROJECT AREAS: HUAI SAM RU (PSN)	HUAI NONG KHO (SKT)	KHLONG SAMO KHON (KPP)	KHLONG SAI (TAK)	GRAND TOTAL
No farms migrate	46.0	57.0	33.0	46.0	182.0
% of farms migr.	71.9	89.1	50.8	71.9	70.8
Av. year lived in the Village	15.7	14.4	19.4	18.2	16.6
REASON OF MIGRATION (%)					
- Because of marriage	26.1	5.3	45.5	8.7	18.7
- To follow the parent	17.4	7.0	9.1	4.3	9.3
- To follow relative or neighbor	13.0	.0	3.0	2.2	4.4
- Because of hazards like flooding	.0	1.8	.0	.0	.5
- A lot of robbers and murders	.0	.0	3.0	19.6	5.5
- No land for crop cultivation	28.3	54.4	27.3	37.0	38.5
- Need to occupy more land	4.3	26.3	9.1	15.2	14.8
- Need to change new profession	8.7	1.8	.0	2.2	3.3
- Others	2.2	3.5	3.0	10.9	4.9
TOTAL	100.0	100.0	100.0	100.0	100.0

TABLE I-2-5 : FARM HOUSEHOLD SETTLEMENT (% DISTRIBUTION)

GROUP COMPOSITION	MODEL PROJECT AREAS: HUAI SAM RU (PSN)	HUAI NONG KHO (SKT)	KHLONG SAMO KHON (KPP)	KHLONG SAI (TAK)	GRAND TOTAL
Settlement Period (yrs)					
1 TO 5	14.1	10.9	27.7	14.1	16.7
6 TO 10	20.3	25.0	12.3	6.3	16.0
11 TO 15	14.1	28.1	3.1	9.4	13.6
16 TO 20	4.7	14.1	6.2	23.4	12.1
21 TO 25	10.9	7.8	9.2	29.7	14.4
26 TO 30	9.4	9.4	13.8	6.3	9.7
31 TO 35	3.1	4.7	4.6	.0	3.1
36 TO 40	7.8	.0	6.2	4.7	4.7
41 TO 45	4.7	.0	6.2	3.1	3.5
46 TO 50	3.1	.0	6.2	1.6	2.7
Over 50	7.8	.0	4.6	1.6	3.5
TOTAL	100.0	100.0	100.0	100.0	100.0
Av. years lived in this village	15.7	14.4	19.4	18.2	16.6

TABLE I-2-6 : FARM INVENTORY BY AVERAGE (STUDY AREA)

ITEMS	% of Farms Possessing (%)	No. of Items per Farm (Reported)	Original Value (Reported)	Period Used (Yrs.)	Useful Life (Yrs.)
Buildings:					
Dwelling/House					
Wood	94.6	1.1	81027.	9.1	27.2
Wood/concrete	3.5	1.2	283636.	2.6	27.5
Local material	3.5	1.0	10444.	9.4	21.0
P. storage barn	40.5	1.1	9603.	9.2	23.0
Storage barn	16.7	1.1	3428.	6.5	14.9
Pen stock	19.5	1.0	1565.	6.1	13.4
Other buildings	7.8	1.0	3138.	5.8	15.9
Mech. Equipment:					
Large tractor	.8	1.0	121000.	2.5	9.0
Medium tractor	.4	1.0	40000.	5.0	15.0
Small tractor	36.2	1.0	31501.	5.0	13.8
Kaset truck	5.4	1.0	43929.	5.6	13.6
Phayanak pipe	7.0	1.0	1539.	3.1	13.0
Water pump	12.1	1.1	4421.	4.3	10.8
Elec. water pump	2.3	1.3	8138.	2.9	12.5
Engine sprayer	1.6	1.3	4180.	1.6	12.6
Winnowing machi.	4.3	1.0	14736.	6.0	14.0
Mills	2.3	1.0	24750.	4.7	18.7
Hand Tools:					
Sprayer	37.4	1.2	544.	2.8	7.8
Carts	19.1	1.0	1632.	7.8	14.7
Push carts	25.3	1.0	893.	4.7	11.1
Plow	10.9	2.2	461.	2.9	5.0
Harrow	8.6	1.1	198.	3.2	5.5
Sickle/knife	53.7	3.5	87.	.6	1.2
Hoe	74.7	2.5	64.	1.0	2.1
Spade	49.8	1.5	27.	1.6	3.0
Shovel	3.9	1.2	41.	2.1	2.8
Other Durables:					
Bicycles	64.6	1.3	1111.	4.4	8.8
Motorcycles	28.4	1.1	19293.	3.7	11.5
Pick-up car	6.2	1.0	131563.	5.7	13.6
Automobile	.4	1.0	400000.	7.0	17.0
Radio	59.9	1.1	365.	3.3	6.4
Radio & recorder	33.1	1.0	2856.	3.1	7.9
T.V. (blk/wht)	36.2	1.0	3160.	3.5	9.0
T.V. (color)	16.3	1.0	8938.	3.1	12.3
Video deck	.8	1.0	5800.	3.0	10.0
Electric fan	38.5	1.3	466.	2.5	5.8
Electric pot	19.1	1.1	908.	2.9	8.2
Electric iron	16.0	1.1	425.	2.3	7.0
Sewing machine	11.3	1.1	3408.	7.3	14.3
Refrigerator	7.8	1.0	8867.	3.1	11.5
Cooking gas stv.	3.1	1.0	1725.	2.4	11.9
Food cabinet	38.9	1.0	648.	5.4	14.1
Clothes cabinet	44.4	1.4	1354.	3.0	10.9

TABLE I-2-7 : LAND USE AND HOLDING

ITEM	MODEL PROJECT AREAS: HUAI SAM RU (PSN)	HUAI NONG KHO (SKT)	KHLONG SAMO KHON (KPP)	KHLONG SAI (TAK)	GRAND TOTAL
FARMING LAND					
Annual Crop	1153.50	1364.50	644.00	1159.00	4321.00
- Owned	1042.50	1254.50	584.00	1078.00	3959.00
- Rented	111.00	110.00	60.00	81.00	362.00
Perennial Crop *	206.50	.00	20.50	2.00	229.00
- Owned	206.50	.00	19.50	2.00	228.00
- Rented	.00	.00	1.00	.00	1.00
Orchard	21.25	.00	1.00	46.00	68.25
- Owned	21.25	.00	1.00	46.00	68.25
- Rented	.00	.00	.00	.00	.00
Fallow	65.00	33.00	46.00	10.00	154.00
- Owned	65.00	33.00	45.00	10.00	153.00
- Rented	.00	.00	1.00	.00	1.00
TOTAL	1446.25	1397.50	711.50	1217.00	4772.25
- Owned	1335.25	1287.50	649.50	1136.00	4408.25
- Rented	111.00	110.00	62.00	81.00	364.00
OTHER LAND					
Other Productiv.	124.00	33.00	46.00	10.00	213.00
- Owned	124.00	33.00	45.00	10.00	212.00
- Rented	.00	.00	1.00	.00	1.00
Pasture	.00	.00	.00	.00	.00
- Owned	.00	.00	.00	.00	.00
- Rented	.00	.00	.00	.00	.00
Fish Pond	.50	.00	.00	2.00	2.50
- Owned	.50	.00	.00	2.00	2.50
- Rented	.00	.00	.00	.00	.00
Homestead	.00	.00	25.00	.00	25.00
- Owned	.00	.00	25.00	.00	25.00
- Rented	.00	.00	.00	.00	.00
Uncultivable	2.00	.00	3.75	1.75	7.50
- Owned	2.00	.00	3.75	1.75	7.50
- Rented	.00	.00	.00	.00	.00
TOTAL	126.50	33.00	74.75	13.75	248.00
- Owned	126.50	33.00	73.75	13.75	247.00
- Rented	.00	.00	1.00	.00	1.00

Note: * Perennial crop includes cassava and sugarcane.

TABLE I-2-8 : CROPPED AREA BY LAND USE (STUDY AREA)

(Unit: rai)

CROP	++ Annual Crops ++ Wet S.	Dry S.	Pere-nnial	Orchard	Total
RICE CROP					
Paddy	2146.50	15.00	.00	.00	2161.50
Upland rice	211.00	.00	.00	.00	211.00
Others	.00	.00	.00	.00	.00
Sub-total	2357.50	15.00	.00	.00	2372.50
UPLAND CROP					
Maize	1869.50	.00	.00	.00	1869.50
Sweet Corn	3.00	3.00	.00	.00	6.00
Mung bean	18.00	768.00	.00	.00	786.00
Cassava	.00	.00	211.50	.00	211.50
Sweet Potato	1.00	.00	.00	.00	1.00
Sugarcane	.00	.00	17.50	.00	17.50
Others	.00	10.00	.00	.00	10.00
Sub-total	1891.50	781.00	229.00	.00	2901.50
OIL CROP					
Groundnuts	4.00	89.25	.00	.00	93.25
Soybean	.00	10.00	.00	.00	10.00
Sesame	.00	82.00	.00	.00	82.00
Other beans	15.00	33.00	.00	.00	48.00
Sub-total	19.00	214.25	.00	.00	233.25
TOBACCO	5.00	.00	.00	.00	5.00
VEGETABLES	1.00	18.50	.00	.00	19.50
FRUITS & TREE	.00	.00	.00	68.25	68.25
T O T A L	4274.00	1028.75	229.00	68.25	5600.00

TABLE I-2-9 : AVERAGE CROP YIELDS (STUDY AREA)

Crop	Planted Area (rai)	Production (Kgs)	Ave. Yield (Kgs/rai)
Rice (TP-NG)	1467.50	453326.00	308.91
Rice (TP-G)	433.50	111450.00	257.09
Rice (Dry BC-NG)	225.50	40650.00	180.27
Rice (Dry BC-G)	25.00	6735.00	269.40
Rice (Wet BC-NG)	10.00	4080.00	408.00
Rice (Uld NG)	168.00	54065.00	321.82
Rice (Uld G)	43.00	14844.00	345.21
Rice (Total)	2372.50	685150.00	288.79
Mung B. (black)	196.00	20847.00	106.36
Mung B. (Shiny)	473.00	42418.00	89.68
Mung B. (Others)	117.00	15098.00	129.04
Mung B. (Total)	786.00	78363.00	99.70
Maize	1869.50	707172.00	378.27
Sweet corn	.00	.00	.00
Cassava	211.50	363164.00	1717.09
Sweet potato	1.00	450.00	450.00
Sugarcane (cwg)	17.50	107875.00	6164.29
Uld crop (other)	10.00	352.00	35.20
Groundnuts	93.25	19118.00	205.02
Soybean	10.00	512.00	51.20
Sesame	82.00	4962.00	60.51
Other beans	48.00	6832.00	142.33
Tobacco (burley)	5.00	1260.00	252.00
Chilli	1.00	213.00	213.00
Bird pepper	.25	60.50	242.00
Gherkin (cucumb)	2.25	1200.00	533.33
String bean	.50	410.00	820.00
Chinese cabbage	2.00	2500.00	1250.00
Green cabbage	.40	200.00	500.00
Green ch. cabbag	.40	400.00	1000.00
Chinese kale	1.40	1350.00	964.29
Water crest	3.40	1500.00	441.18
Vege. (others)	7.90	620.00	78.48
Mango	16.75	9220.00	550.45
Longan	10.00	4800.00	480.00
Castard apple	8.00	4000.00	500.00
Lady finger bana	24.00	122250.00	5093.75
Namwha banana	9.00	33600.00	3733.33

TP: Transplanting, BC: Broadcasting, NG: Non-Glutinous
G: Glutinous, Uld: Upland

TABLE I-2-10 : AVERAGE CROP PRICES BY DIFFERENT SELLING POINT

WHOLE STUDY AREA (4 Model Project Areas)

CROPS	++ Sold at Field ++ Quant'y (Ton)	Value (B1000)	Price (B/Kg)	+++ Sold at Home ++ Quant'y (Ton)	Value (B1000)	Price (B/Kg)	++ Sold at Market + Quant'y (Ton)	Value (B1000)	Price (B/Kg)	AVERAGE PRICE (B/Kg)
Rice (TP-NG)	.0	.0	.00	106.7	394.6	3.70	95.7	265.5	2.78	3.26
Rice (TP-G)	.0	.0	.00	15.1	44.6	2.95	2.0	5.9	3.00	2.96
Rice (Dry BC-NG)	.0	.0	.00	10.9	35.2	3.23	5.1	17.7	3.45	3.30
Rice (Dry BC-G)	.0	.0	.00	.0	.0	.00	.0	.0	.00	.00
Rice (Wet BC-NG)	.0	.0	.00	4.0	14.8	3.70	.0	.0	.00	3.70
Rice (Uld NG)	.0	.0	.00	.0	.0	.00	.0	.0	.00	.00
Rice (Uld G)	.0	.0	.00	.0	.0	.00	.0	.0	.00	.00
Rice (Total)	.0	.0	.00	136.7	489.3	3.58	102.8	289.1	2.81	3.25
Mung B. (black)	1.3	10.6	8.17	14.5	97.0	6.70	3.9	29.3	7.52	6.96
Mung B. (Shiny)	5.8	37.5	6.49	26.7	185.0	6.92	7.2	41.6	5.75	6.65
Mung B. (Others)	1.5	8.2	5.64	5.5	32.0	5.84	7.7	53.6	6.98	6.42
Mung B. (Total)	8.5	56.4	6.60	46.7	314.1	6.73	18.8	124.5	6.62	6.69
Maize	137.7	362.2	2.63	417.1	1054.8	2.53	126.3	276.5	2.19	2.49
Sweet corn	.0	.0	.00	.0	.0	.00	.0	.0	.00	.00
Cassava	205.9	132.8	.65	48.7	32.1	.66	89.8	52.3	.58	.63
Sweet potato	.0	.0	.00	.4	.7	1.61	.0	.0	.00	1.61
Sugarcane (cwg)	.0	.0	.00	83.7	33.8	.40	.7	.3	.39	.40
Uld crop (other)	.0	.0	.00	.3	1.7	5.00	.0	.0	.00	5.00
Groundnuts	4.6	42.7	9.19	10.3	84.6	8.21	2.9	26.4	9.21	8.63
Soybean	.0	.0	.00	.4	4.0	9.00	.0	.0	.00	9.00
Sesame	.0	.0	.00	4.9	82.4	16.97	.0	.0	.00	16.97
Other beans	.0	.0	.00	2.6	14.4	5.61	3.5	21.6	6.25	5.98
Tobacco (burley)	.0	.0	.00	.7	24.5	35.00	.4	3.6	8.00	24.43
Chilli	.0	.0	.00	.0	.0	.00	.2	6.9	32.86	32.86
Bird pepper	.0	.0	.00	.1	1.8	30.00	.0	.0	.00	30.00
Gherkin (cucumb)	1.0	5.0	5.00	.0	.0	.00	.2	.6	3.00	4.67
String bean	.0	.0	.00	.0	.0	.00	.4	2.3	5.49	5.49
Chinese cabbage	.0	.0	.00	.0	.0	.00	2.5	12.0	4.80	4.80
Green cabbage	.2	.1	.50	.0	.0	.00	.0	.0	.00	.50
Green ch. cabbag	.4	2.0	5.00	.0	.0	.00	.0	.0	.00	5.00
Chinese kale	1.4	7.1	5.22	.0	.0	.00	.0	.0	.00	5.22
Water crest	1.5	5.5	3.67	.0	.0	.00	.0	.0	.00	3.67
Vege. (others)	.3	1.5	5.00	.0	.2	10.00	.3	1.6	5.50	5.40
Mango	.0	.0	.00	2.0	4.5	2.25	6.7	10.1	1.50	1.67
Longan	4.8	38.4	8.00	.0	.0	.00	.0	.0	.00	8.00
Castard apple	.0	.0	.00	4.0	20.0	5.00	.0	.0	.00	5.00
Lady finger bana	102.6	136.8	1.33	10.0	5.0	.50	.0	.0	.00	1.26
Namwha banana	.0	.0	.00	33.0	7.2	.22	.0	.0	.00	.22

TABLE I-2-11 : LIVESTOCK INVENTORY PER FARM IN NUMBER (STUDY AREA)

ITEMS	BEGINNING INVENTORY	+++++++++++++++ TRANSACTIONS DURING YEAR +++++++++++++++ BORN	DIE & LOST	PURCHASED	SOLD	CONSUMED	ENDING INVENTORY
B U F F A L O E S							
- Less than 2 yr	.07	.02	.01	.00	.01	.00	.07
- More than 2 yr	.79	.20	.02	.03	.10	.02	.89
- Sub-total	.87	.22	.03	.03	.11	.02	.97
C A T T L E S							
- Less than 2 yr	.21	.04	.01	.00	.03	.00	.21
- More than 2 yr	1.14	.25	.05	.11	.30	.00	1.14
- Sub-total	1.35	.29	.05	.11	.33	.00	1.35
Swine	1.12	.72	.12	.20	.89	.11	.93
Young pig	.03	.00	.00	.02	.01	.01	.03
Chicken	9.68	11.71	8.18	.16	1.77	4.63	6.98
Ducks	1.28	.13	.15	.05	.62	.16	.52
Goose	.00	.00	.00	.00	.00	.00	.00
Goats	.00	.00	.00	.00	.00	.00	.00
Sheeps	.00	.00	.00	.00	.00	.00	.00
Eggs	.00	.00	.00	.00	.00	.00	.00
Others	11.68	.00	.00	.00	.00	.00	11.68

TABLE I-2-12 : EXPENSES AND INCOME OF LIVESTOCK RAISING PER FARM (STUDY AREA)

ITEMS	SOLD No. of Heads	SOLD Value (Baht)	CONSUMED No. of Heads	CONSUMED Value (Baht)	PURCHASED No. of Heads	PURCHASED Value (Baht)	VALUE CHANGED (Baht)	PRODUCTION COST (Baht)	NET INCOME (Baht)
BUFFALOES									
- Less than 2 yr	.008	12.	.004	0.	.000	0.	10.	12.	10.
- More than 2 yr	.097	555.	.016	39.	.031	109.	802.	16.	1271.
- Sub-total	.105	567.	.019	39.	.031	109.	812.	28.	1282.
CATTLES									
- Less than 2 yr	.031	151.	.000	0.	.000	0.	646.	8.	788.
- More than 2 yr	.304	1797.	.000	0.	.105	524.	813.	162.	1924.
- Sub-total	.335	1948.	.000	0.	.105	524.	1459.	171.	2712.
Swine	.891	1110.	.105	103.	.202	107.	371.	443.	1034.
Young pig	.008	2.	.012	8.	.016	2.	-1.	1.	6.
Chicken	1.767	67.	4.630	174.	.163	3.	-53.	26.	159.
Ducks	.623	22.	.163	4.	.047	1.	3.	6.	22.
Goose	.000	0.	.000	0.	.000	0.	0.	0.	0.
Goats	.000	0.	.000	0.	.000	0.	0.	0.	0.
Sheeps	.000	0.	.000	0.	.000	0.	0.	0.	0.
Eggs	.000	0.	.000	0.	.000	0.	0.	0.	0.
Others	.000	0.	.000	0.	.000	0.	11.	2.	9.
TOTAL	3.728	3716.	4.930	328.	.564	746.	2603.	676.	2622.

TABLE I-2-13 : OFF-FARM HIRED LABOUR INCOME BY GROUP AVERAGES

TYPE OF WORK	HUAI SAM RU % of Cases	HUAI SAM RU Amount (Baht)	HUAI NONG KHO % of Cases	HUAI NONG KHO Amount (Baht)	KHLONG SAMO KHON % of Cases	KHLONG SAMO KHON Amount (Baht)	KHLONG SAI % of Cases	KHLONG SAI Amount (Baht)	STUDY AREA % of Cases	STUDY AREA Amount (Baht)
Farm Works Inside Village										
Human labour	74.4	761.	52.2	949.	67.6	1068.	83.1	1201.	69.7	995.
with machine	3.8	209.	9.0	481.	2.8	117.	1.4	70.	4.2	219.
with animal	.0	0.	.0	0.	.0	0.	.0	0.	.0	0.
Sub-total	78.2	970.	61.2	1430.	70.4	1185.	84.5	1272.	73.9	1214.
Farm Works Outside Village										
Human labour	5.1	47.	20.9	2175.	9.9	307.	1.4	12.	9.1	634.
with machine	.0	0.	.0	0.	.0	0.	.0	0.	.0	0.
with animal	.0	0.	.0	0.	.0	0.	.0	0.	.0	0.
Sub-total	5.1	47.	20.9	2175.	9.9	307.	1.4	12.	9.1	634.
Off Farm Workers										
Inside village	.0	0.	3.0	131.	8.5	278.	4.2	208.	3.8	155.
Outside vill.	9.0	1828.	10.4	1009.	8.5	1237.	.0	0.	7.0	1019.
Sub-total	9.0	1828.	13.4	1140.	16.9	1515.	4.2	208.	10.8	1174.
Gov't Employee	7.7	1004.	1.5	115.	1.4	118.	5.6	797.	4.2	507.
Finance Employee	.0	0.	.0	0.	.0	0.	.0	0.	.0	0.
Services	.0	0.	3.0	197.	.0	0.	2.8	2063.	1.4	563.
Others	.0	0.	.0	0.	1.4	77.	1.4	1500.	.7	393.
TOTAL	100.0	3849.	100.0	5058.	100.0	3202.	100.0	5850.	100.0	4485.

TABLE I-2-14 : NET NON-AGRICULTURAL INCOME PER FARM BY GROUP AVERAGES

TYPE OF WORK	HUAI SAM RU % of Cases	HUAI SAM RU Amount (Baht)	HUAI NONG KHO % of Cases	HUAI NONG KHO Amount (Baht)	KHLONG SAMO KHON % of Cases	KHLONG SAMO KHON Amount (Baht)	KHLONG SAI % of Cases	KHLONG SAI Amount (Baht)	STUDY AREA % of Cases	STUDY AREA Amount (Baht)
Sell Products from Homestead Area	13.3	39.	3.6	50.	5.4	52.	7.4	80.	5.8	55.
Home Industry	.0	0.	7.1	537.	35.5	2380.	11.1	836.	20.9	944.
Factory Products										
- Small-scale	.0	0.	3.6	119.	1.1	57.	7.4	488.	2.6	165.
- Medium-scale	.0	0.	5.4	148.	2.2	225.	3.7	23.	3.1	100.
- Large-scale	.0	0.	1.8	109.	1.1	1477.	3.7	1278.	1.6	719.
- Sub-totsl	.0	0.	10.7	377.	4.3	1759.	14.8	1789.	7.3	984.
Forest Products	13.3	141.	7.1	660.	17.2	1096.	7.4	188.	12.6	523.
Receive Money from Relative	13.3	75.	12.5	711.	4.3	362.	18.5	530.	9.4	419.
Other Rent	.0	0.	.0	0.	1.1	18.	.0	0.	.5	5.
Fish Catching	6.7	29.	.0	0.	.0	0.	3.7	70.	1.0	25.
Trading/Services	40.0	1041.	41.1	3934.	20.4	3887.	25.9	2109.	28.8	2747.
Others	13.3	109.	17.9	1506.	11.8	781.	11.1	419.	13.6	704.
Total	100.0	1432.	100.0	7774.	100.0	10335.	100.0	6021.	100.0	6406.

TABLE I-2-15 : YEARLY HOUSEHOLD EXPENDITURE PER FARM BY ITEM

I T E M S	HUAI SAM RU Bahts	HUAI SAM RU (%)	HUAI NONG KHO Bahts	HUAI NONG KHO (%)	KHLONG SAMO KHON Bahts	KHLONG SAMO KHON (%)	KHLONG SAI Bahts	KHLONG SAI (%)	STUDY AREA Bahts	STUDY AREA (%)
Food & Beverage	5506.	44.0	5682.	45.9	5332.	48.6	7790.	46.2	6075.	46.1
Alcohol Beverage & Tobacco products	1023.	8.2	868.	7.0	866.	7.9	659.	3.9	854.	6.5
Cloths & Shoes	1205.	9.6	1052.	8.5	995.	9.1	1604.	9.5	1213.	9.2
Housing	562.	4.5	553.	4.5	364.	3.3	1346.	8.0	705.	5.4
Personal Care	788.	6.3	644.	5.2	1068.	9.7	1091.	6.5	899.	6.8
Communication	600.	4.8	832.	6.7	592.	5.4	1072.	6.4	773.	5.9
Recreation etc.	133.	1.1	178.	1.4	157.	1.4	211.	1.2	169.	1.3
Religion/Cerem.	118.	.9	334.	2.7	150.	1.4	127.	.8	182.	1.4
Festival/Party	639.	5.1	444.	3.6	319.	2.9	404.	2.4	451.	3.4
Education	519.	4.1	156.	1.3	393.	3.6	811.	4.8	470.	3.6
Medical Care	859.	6.9	818.	6.6	561.	5.1	1016.	6.0	812.	6.2
Non-Consumption	572.	4.6	810.	6.6	170.	1.6	683.	4.1	557.	4.2
Others	0.	.0	0.	.0	0.	.0	39.	.2	10.	.1
Total	12524.	100.0	12371.	100.0	10966.	100.0	16853.	100.0	13170.	100.0

Note: Non-Consumption includes taxes, gifts, donation, insurance, etc.

TABLE I-2-16 : CREDIT OBTAINED PER FARM BY SOURCES (STUDY AREA)

PARTICULARS	DEBTS INCURRED DURING YEAR BY SOURCES TOTAL	BAAC	COM. BANK	CO-OP	MER-CHANT	RELA-TIVES	NEIG-HBOUR
Farm obtained(%)	56.8	26.5	6.2	3.5	10.5	5.8	4.3
Principal (baht)	6321.4	3014.8	1645.9	291.8	592.4	578.2	198.2
Interest (baht)	916.7	372.3	244.6	36.5	190.6	5.4	67.2
Interest (%/yr)	14.5	12.3	14.9	12.5	32.2	.9	33.9
Total Payment(B)	1788.0	702.1	514.6	.0	353.4	179.0	38.9
End Out. Debt(B)	5450.1	2684.9	1375.9	328.3	429.7	404.7	226.6
Loan period (yr)	2.2	1.9	2.4	2.2	2.2	3.4	1.7
Purpose of Loan for: (%)							
Agriculture							
- Purchased							
Equip./Tools	21.2	19.2	34.0	12.0	27.9	.0	.0
Land	.4	.8	.0	.0	.0	.0	.0
Animal	12.4	16.8	9.5	14.7	.0	.0	39.3
Farm input	19.8	29.3	8.7	53.3	5.6	1.3	13.7
- Hired labour	2.3	2.7	.0	.0	9.9	1.3	.0
- Others	2.0	2.6	.0	.0	.0	6.7	5.9
- Sub-total	58.1	71.3	52.2	80.0	43.3	9.4	58.9
Non-agriculture	41.9	28.7	47.8	20.0	56.7	90.6	41.1
T O T A L	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Guaranty for Loan: (%)							
Guaranteed	90.5	97.0	100.0	100.0	71.6	59.9	44.7
None guaranteed	9.5	3.0	.0	.0	28.4	40.1	55.3
Type of Guaranty by: (%)							
- Land	45.1	26.0	95.3	42.7	7.8	16.9	40.7
- Other Imovable	4.6	8.9	.0	.0	.0	.0	.0
- Person	45.4	65.1	4.7	57.3	76.6	33.7	6.6
- Movable Asset	.0	.0	.0	.0	.0	.0	.0
- Others	5.0	.0	.0	.0	15.6	49.4	52.7
- Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

I-3 Project Benefit

I-3-1 Irrigated Agriculture

(1) General Description

A benefit of irrigated agriculture is basically computed as an incremental net production value of crop cultivation between without and with project cases. The net production value (N.P.V.) of crop can be obtained by deducting production cost (P.C.) from gross production value (G.P.V.) of respective crop which is result of multiplying yield and price of each crop. In the case of this study, an incremental crop production shall be brought by an irrigation water through either a storage dam or a diversion weir in the existing streams.

(2) Storage Project

There are 4 storage projects, one each for 4 model project areas covering total irrigable area of 2,165 ha, consisting of 1,022 ha in the Huai Sam Ru area in Phitsanulok Province, 574 ha in the Huai Nong Kho area in Sukhothai Province, 179 ha in the Khlong Samo Khon area in Kamphaeng Phet Province and 390 ha in the Khlong Sai area in Tak Province. Through implementation of the projects, the anticipated crops' benefit in economic terms excluding those of orchard and bamboo which belong to a category of perennial crop, is estimated in Table I-3-1, at their full production stage.

The anticipated economic benefit arising from cultivation of orchard (mango) and bamboo is shown in Tables I-3-2 and I-3-3, respectively. It is expected to reach their full production stage in 10 years for orchard and 4 years for bamboo, showing gradual increase of their yield. Thus, both crops will bring about negative benefit for several years after planting.

(3) Diversion Project

In the model project, none of weir project is planned, but total of 26 projects are planned under the overall plan, covering total irrigable area of 7,140 ha, consisting of 1,080 ha with 5 projects in Phitsanulok Province, 1,210 ha with 4 projects in Sukhothai Province, 2,580 ha with 9 projects in Kamphaeng Phet Province and 2,270 ha with 8 projects in Tak Province. In the diversion projects, it is basically

planned to cultivate paddy only during the wet season in both without and with project cases, and to cultivate some upland crops on 10 percent of cultivable land during the dry season in only with project case. The anticipated economic crop benefit with calculation details is given in Table I-3-4.

10-3-2 Rural Road

(1) Beneficiary

On the basis of the proposed plan for the rural road development with its alignment under the overall plan, road beneficiaries, especially those for backward villages were identified in the following, of which details are indicated in Table I-3-5.

Province	Road Length (Km)	Backward Village	Household	Population	Farming Area (rai)
Phitsanulok	391.4	149	19,572	93,834	587,732
Sukhothai	251.6	112	14,251	67,484	323,648
Kamphaeng Phet	367.0	184	26,357	134,920	736,899
Tak	119.5	122	12,749	67,453	210,216
Total	1,129.5	567	72,929	363,691	1,858,495

In the above, total road length includes ARD standard road, service road Type-I and Type-II, covering only backward villages. In addition, there are several road construction plans which route do not cover backward villages, but beneficiaries for these could not be identified at this stage.

(2) Field Investigation

In order to estimate a vehicle operating cost (VOC), some attempts were carried out to get necessary information such as an operating speed by category of road, fuel consumption, and so on, by using a pick-up truck. The results are summarized below:

	Rough Road	Paved Road (Laterite)
1. Operating Speed(Km/hr)	5 - 20	40 - 60
(Average)	(10)	(50)
2. Fuel Consumption (Km/l)	3 - 5	6 - 10
(Average)	(4)	(8)

It is needles to say that the field trial has been very limited, especially done during the dry season, thus severer condition for the rough road would be expected during the wet season.

(3) Estimation of VOC

On the basis of the said field trial data as well as several assumptions, VOCs by category of road are estimated. The assumptions applied are as follows:

Basic Assumptions

1. Type of Vehicle:	Pick-up with capacity of 1 ton
2. Purchasing Price:	250,000 Bahts
3. Vehicle Operation:	8 hours/day, 25 days/month
	2,400 hours/year
4. Interest:	12.5 percent/year
5. Annual Repairing Cost:	5 percent of purchase price
6. Durable Time:	Paved Road: 18,000 hours
	Rough Road: 12,000 hours
7. Lubricant Cost:	5 percent of fuel cost
8. Driver's Wage:	200 Bahts/day
9. Residual Value:	None

Estimation of VOC (B/Km/unit)

	Without Project	With Project		
		ARD STD	SRV-I	SRV-II
1. Ave. Speed (Km/hr)	10	45	35	30
2. Fixed Cost				
- Depreciation	2.08(2.08)	0.31(0.31)	0.40(0.40)	0.46(0.46)
- Repairing	0.52(0.52)	0.12(0.12)	0.15(0.15)	0.17(0.17)
- Interest	1.30(-)	0.29(-)	0.37(-)	0.43(-)
Sub-total	3.90(2.60)	0.72(0.43)	0.92(0.55)	1.06(0.63)
3. Variable Cost				
- Fuel	2.18(2.18)	1.21(1.21)	1.55(1.55)	1.81(1.81)
- Lubricant	0.11(0.11)	0.06(0.06)	0.08(0.08)	0.09(0.09)
- Driver	2.50(2.50)	0.56(0.56)	0.72(0.72)	0.83(0.83)
Sub-total	4.79(4.79)	1.83(1.83)	2.35(2.35)	2.73(2.73)
4. Total VOC	8.69(7.39)	2.55(2.26)	3.27(2.90)	3.79(3.36)
5. Saving of VOC	-	6.14(5.13)	5.42(4.49)	4.90(4.03)

Note: Figures in parentheses show an economic VOC.

(4) Estimation of A.D.T. and Saving of V.O.C.

According to DOH (Department of Highway) highway classification, A. D.T. (Average Daily Traffic) is estimated ranging 0 to 300 for the local roads. Supposing the A.D.T. for local roads in whole Kingdom would be 150 on an average, the A.D.T. in the study area is worked out 100, taking into consideration difference in economic activity in terms of per capita regional income between the study area and the whole Kingdom.

On the basis of the estimated A.D.T. for the study area, respective A.D.T. for each road alignment has been estimated, taking into account beneficiary population and farmland in comparison with those for the study area on the average, as shown in Table I-3-6, with saving amount of V.O.C.

I-3-3 Rural Water Supply

The component of rural water supply is considered one of the basic minimum needs. It is one of responsibilities laying on an administrative authority concerned to stably secure drinking water with good quality for all inhabitant throughout a year. For this purpose, it is necessary to invest a certain amount for securing water sources and constructing treatment and distribution facilities, and thus a beneficiary should bear a full and/or part of these investment. Usually, a benefit of the component is calculated as a "willingness to pay". In this connection, the prevailing water charge collected by PWA in the Study area is based for estimation of the willingness to pay, as shown below;

Water Charges by PWA

Monthly Used Amount (cu.m)	Charge (Baht/cu.m/month) Financial	Economic
1 - 10	3.75	3.45
11 - 20	4.50	4.14
21 - 30	6.50	5.98
31 - 50	7.50	6.90
51 - 80	8.00	7.36
81 - 100	8.50	7.82
101 - 300	9.00	8.28
301 - 1,000	9.25	8.51
1,001 - 2,000	9.50	8.74
2,001 - 3,000	9.75	8.97
3,001 and over	10.00	9.20