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AN EXAMINATION OF THE INSTITUTIONAL AND ECONOMIC FACTORS
INFLUENCING THAILAND'S LAND REFORM PROGRAM:
A COST-RECOVERY ANALYSIS

By
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ABSTRACT

AN EXAMINATION OF THE INSTITUTIONAL AND ECONOMIC FACTORS INFLUENCING THAILAND'S LAND REFORM PROGRAM: A COST-RECOVERY ANALYSIS

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Intensification of agriculture poses a number of physical and biological, economic and institutional issues. Plans for more intensive resource use must be sound from a physical and biological standpoint. They must pass the test of economic feasibility and they must be institutionally acceptable. When land reform is used as one of the primary mechanisms to intensify agriculture, some of the major issues involve institutional constraints.

The concept of property encompasses a whole set of social relationships. Land reform strengthens the principle of private property at the lowest level of society resulting in a new set of social relationships and a shift of power within the socio-economic structure. Success for a land reform depends on the political will of the government to follow through on the enacted legislation and the flexibility of the social relationships within society to withstand the pressures these shifts in power will bring. Despite the importance of understanding the political and social factors of land reform, program evaluations focus more attention on economic factors than the political and social factors.

This study was carried out in response to a request from Thailand's Agricultural Land Reform Office to provide them with guidelines for

recapturing investment monies allocated to the development of on-farm irrigation systems. To accomplish this task, additional information was needed on the institutional setting of land reform.

Four specific objectives provide the focus of this study:

(1) the examination of the institutional setting and an identification of the important actors influencing land reform; (2) the assessment of the capabilities of project beneficiaries to repay various types of costs; (3) the development of guidelines for establishing a cost-recovery policy; and (4) the evaluation of selected development schemes being implemented in land reform areas.

The research approach used for achieving these objectives consists of two distinct components. The first component involves a broad literature review of the institutional setting of land reform focusing on public administration, social and cultural traditions, and religious attitudes. The second component involves the application of land rent theory to the development of guidelines for cost-recovery. After analyzing farm budgets, the net returns are factored among the various factors of production, capital, management, labor, and land. That portion attributed to land is further divided into a water component which is used as the chargeable amount in cost-recovery.

This study shows that the principal actors crucial to the successful implementation of land reform are the religious institutions, the monarchy, the bureaucracy, the politicians, the landlords and the rural people. It also shows under various conditions what government officials can realistically expect to recover in the way of investment costs. Probably the most important result is the recognition of the serious

resource base limitations of many land reform areas and the pressing need to focus more attention on proper resource management.

This study contains an historical review of Thailand's available land tenure data and raises some questions concerning the actual land tenure situation. Skewed land tenure arrangements are found in relatively small sections of the country surrounding Bangkok. Even though pressures on the land from rapid population growth and an increasing demand for food have been building, land reform will not solve all the resource utilization problems emerging throughout the country. It should be recognized that land reform is one of many tools which can be used in improving the social and economic well-being of rural people.

ACKNOWLEDGEMENTS

To laugh often and much; to win the respect of intelligent people and the affection of honest critics and endure the betrayal of false friends; to appreciate beauty, to find the best in others; to leave the world a bit better, whether by a healthy child, a garden patch or a redeemed social condition; to know even one life has breathed easier because you lived. This is to have succeeded.

Ralph Waldo Emerson

Throughout the history of mankind men of humble and unassertive as well as proud and powerful persuasion have attempted to improve the social well-being of their fellow men. Many of these attempts have proven successful while others have been shattered by opposing forces. Land reform has been used since the early Roman times as one means to adjust economic and social inequities and it, too, has seen success and failure. This report examines the land reform program presently being implemented in Thailand. The examination looks at various institutional and economic factors which are often neglected in most evaluations, in an attempt to anticipate whether this program will succeed or fail.

The story as described here does not adequately reflect the intentions of one man, Chaityong Chucart, who can accurately be called the Father of Thai land reform. No man more appropriately fulfills Emerson's criteria

for success than Chaियong. Improving the economic and social well-being of Thai farmers has long been Chaियong's dream and challenge through his professional career. The seeds for land reform were sown many years ago by Chaियong and he nourished them to fruition. During those years of waiting he laughed often, won the respect and admiration of the academic and bureaucratic communities, and the affection of the people, and endured the many false starts and frustrated hopes along the way. Chaियong directed the land reform program from its conception in 1975, more from spiritual strength than physical strength. His untimely death in 1977 has been a blow to the land reform movement. Yet, he has succeeded in nurturing a dream into an entity which is entrenched enough to survive. It is the responsibility of those who follow to see land reform through to the end.

I am deeply indebted to Dr. Chaियong Chuchart for his continual enthusiastic support and professional advice while I was conducting my research. He is a man truly dedicated to his beliefs and goals. He taught me so much in fifteen short months. His attitude infused me with the inspiration to not only finish this report but to continue my efforts to improve the condition of mankind throughout the world. To him I will always be grateful.

In this short space, it is not possible to recognize all of the individuals who contributed to the completion of this study. Mention can only be made of those who contributed the most time and energy.

My heartiest thanks must go to Thaveep Thaveeponich, Deputy Director of the Land Settlement Division, who personally took it upon himself to see that I had a number of opportunities to visit agricultural projects throughout Thailand. His efforts and the assistance received from his

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This study would not have been completed had it not been for the constant support my wife, Pam, provided throughout my graduate studies. Not only did she work to put food on the table, she was responsible for typing the initial and final drafts of the study. On all accounts she has done an excellent job. Jenny, our daughter, arrived just in time to see this dissertation through to completion.

I alone am responsible for the final shape and substance of this study.

TABLE OF CONTENTS

LIST OF TABLES	xi
LIST OF FIGURES	xvi
LIST OF MAPS	xvii
LIST OF SYMBOLS, ABBEEVIATIONS, OR NOMENCLATURE	xviii
CHAPTER	
I. INTRODUCTION	1
Current Pressures of Man on Land in Thailand	4
Evaluating the Social and Economic Success of	
Land Reform	6
Study Objectives	9
Problem Statement	10
Study Approach	10
Institutional Setting	12
Cost-Recovery	12
Specific Study Objectives	13
Relevance of Findings	14
Organization of Study	14
II. PUTTING LAND TENURE AND LAND REFORM IN PERSPECTIVE	16
Thailand's Land Tenure Situation	16
Land Ownership Code	17
Land Tenure	22
South	27
Northeast	30
North	30
Central Plains	34
Landlord-Tenant Relationships: Socio-Economic	
Characteristics of Land Tenure	54
Summary	60
Thailand's New Legislation	62
Land Rent Control Act	62
Land Consolidation Act	63
Land Reform Act	65
The Act's Weaknesses: Summary	71
Land Reform Program	74
Land Settlement Program	75
Land Consolidation	77
Current Land Reform Program	79
Summary	82

III. INSTITUTIONAL SETTING	85
Cultural-Social-Political Institutions	86
Religion	86
Monarchy	90
Political Establishment	91
Rural Population	94
Civilian Bureaucracy	98
Landlords	108
Summary	109
Agricultural Infrastructure	110
Credit	111
Extension	114
Marketing	116
Cooperatives	117
Summary	120
Summary	121
IV. METHODOLOGY	123
Literature Review	124
Basic Land Economic Theory	134
Land Rent	134
Rental Arrangements	140
Resource Development Decisions	142
Alternative Cost-Recovery Approaches	144
World Bank Approach	145
Department of Agricultural Economics Approach	150
ILACO Approach	153
Strengths and Weaknesses: A Summary	157
Project Methodology	160
Summary	161
V. PROJECT COSTS, PROJECT BENEFITS, AND CRITERIA FOR ANALYSIS . .	163
Project Costs	163
Identification of Costs	165
Operation and maintenance costs	165
Project reclamation and development costs	165
Public utility cost	166
House construction and other development costs	166
Government expenditures for cadastral survey, issuing title deeds, and acquiring land	167
Interest in government outlays for acquiring and developing lands	167
Public costs for administration of land reform	168
Opportunity costs	168
Issues and Theoretical Implications	168
Summary	176
Project Benefits	177
Private Benefits	179
Total returns to the individual	179

Social Benefits	182
Rice premium, rice export tax and rice reserve requirement	183
Land taxes and taxes on inputs	184
Food supply	185
Labor generation	186
Rural prosperity, contentment and stability	189
Political institutions	190
Problems with Benefits	191
Summary	192
Criteria for Analysis	192
Benefits	193
Costs	194
Production Assumptions	196
Project Assumptions	197
Opportunity Costs	198
Review of Criteria	198
Summary	199
 VI. "WITH-WITHOUT" ASSESSMENT OF SELECTED LAND REFORM PROJECTS . .	201
Selection of Study Areas	202
General Setting	205
Natural Resource Base	206
Climate	206
Soils	209
Land classification	211
Human Resources	213
Population	214
Education	216
Occupational pattern	217
Land Use and Tenure System	219
Land use	219
Tenure system	219
Tenancy	222
Rental arrangements	228
Agricultural Organization	233
Ban Na's Agricultural Situation	233
Cropping pattern	233
Yields and returns	234
Operating costs	235
Crop budget	238
Nong Sua's Agricultural Situation	241
Cropping pattern	241
Yields and returns	242
Operating costs	243
Crop budget	247
Credit	249
Farmers' Associations and Cooperatives	256
Extension	256

With-Without Assessment for Ban Na	258
Farmer's Income	259
Income from rice	259
Income from upland crops	260
Income from domestic animals and fishing	261
Income from off-farm activities	261
Total yearly income	263
Project Feasibility	264
Vegetable farming in Thailand	265
Farm layout	267
Cropping pattern	268
Labor requirements	271
Production costs	272
Returns and yields	273
With-Without Test	275
Assumptions for with and without projections	275
Farmer's income with and without cases	278
With-Without Assessment for Nong Sua	283
Farmer's Income	283
Income from rice	283
Income from upland crops	284
Income from domestic animals and fishing	285
Income from off-farm activities	285
Total yearly income	286
Project Feasibility	288
With-Without Test	288
Assumptions for with and without projections	288
Farmer's income with and without cases	294
Sensitivity tests	294
Summary	298
VII. COST-RECOVERY ANALYSIS	300
Returns to Inputs	301
Capital	306
Management	307
Labor	307
Land	309
Repayment Capacity	310
Cost Estimates	315
Cost-Recovery	317
Ban Na	318
Nong Sua	320
Land Purchase and Rental Rates	325
Target Income	328
Collection of Charges	331
Summary	334

VIII.	SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	337
	Summary	337
	Conclusions	340
	Tenancy	342
	Land Reform Legislation	344
	Institutional Setting	346
	Development Projects	347
	Cost-Recovery Analysis	348
	Recapitulation	350
	Recommendations	352
	Data Improvements	352
	Alternative Project Recommendations	353
	Agricultural Infrastructure	355
	Cost-Recovery	356
APPENDIX		
A	LAND TENURE DATA	358
B	PRODUCTION UNIT MODEL	365
C	WITH AND WITHOUT PROJECTIONS FOR BAN NA	367
D	WITH AND WITHOUT PROJECTIONS FOR NONG SUA	369
E	INCOME ALLOCATIONS TO PRODUCTION FACTORS	373
BIBLIOGRAPHY		377

LIST OF TABLES

<u>Table</u>	<u>Page</u>
VI-1 Meteorological Data: Mean Monthly Air Temperature and Average Monthly Rainfall for Nakorn Nayok and Eastern Pathum Thani	209
VI-2 Average Size of Farm Family with Farm Size and Tenure Arrangement Comparisons	217
VI-3 Farm Size Distribution in Number of Farms	220
VI-4 Average Land Holding, According to Type of Operator .	222
VI-5 Land Tenure in District Ban Na, 1967	223
VI-6 Land Tenure in District Ban Na, 1974	224
VI-7 Land Tenure in District Ban Na and Project Area, 1975	225
VI-8 Land Tenure in District Nong Sua, 1967	226
VI-9 Land Tenure in District Nong Sua, 1976	227
VI-10 Land Tenure in District Nong Sua, 1975	227
VI-11 Rental Contracts and Rental Arrangements	230
VI-12 Payment Arrangements in Cash and Kind	230
VI-13 Third-Hand Rental Payments on Crown Lands	232
VI-14 Rice Yields in 1975 Wet Season for District Ban Na and the Project Area	234
VI-15 Costs Incurred for Hired Labor and Plowing Services in Wet Season, 1975 in Average Baht Per Rai, and as Percentage of Total Costs	237
VI-16 Costs Incurred for Other Production Inputs in Wet Season, 1975 in Average Baht Per Rai, and as Percentage of Total Costs	237
VI-17 Average Crop Balance Sheet for Project Area, Ban Na .	239

VI-18	Crop Balance Sheet by Land Tenure for Project Area, Ban Na	240
VI-19	Rai Planted, Cropping Intensity, and Average Yield in Nong Sua	242
VI-20	Costs Incurred for Hired Labor and Plowing Service in Nong Sua, Wet Season, 1975, Average Baht/Rai, and as Percentage of Total Cost	244
VI-21	Other Production Costs in Nong Sua, Wet Season, 1975, Average Baht/Rai, and as Percentage of Total Cost .	244
VI-22	Costs Incurred for Hired Labor and Plowing Services in Nong Sua, Dry Season, 1975, Average Baht/Rai and as Percentage of Total Cost	245
VI-23	Other Production Costs in Nong Sua, Dry Season, 1975, Average Baht/Rai and as Percentage of Total Cost . .	245
VI-24	Average Crop Balance Sheet for Nong Sua	248
VI-25	Crop Balance Sheet by Land Tenure for Nong Sua	250
VI-26	Purpose of Credit	251
VI-27	Source of Loans	253
VI-28	Amount of Loan in Baht for Project Area, Ban Na . . .	254
VI-29	Amount of Loan in Baht for Project Area, Nong Sua . .	256
VI-30	Farmer's Economic Problems	257
VI-31	Distribution of Rice Output in Percent and Classified by Tenure Pattern for Project Area, Ban Na	259
VI-32	Farmer's Average Income from Non-Rice Activities, Project Area Ban Na, in Baht per Rai	262
VI-33	Total Farm Family Income per Year All Sources, Project Area, Ban Na	263
VI-34	Labor Inputs for Various Vegetable Crops, Man Hours per Rai	272
VI-35	Expenses for Different Inputs as Percent of Total Production Costs	274
VI-36	Net Returns from Selected Cropping Combinations, Baht per Rai	274
VI-37	With and Without Project Projections for Land Improvement in Ban Na	279

VI-38	With Project Projections for Vegetable Farming in Ban Na	280
VI-39	Yearly Net Income Expected With the Project, in Baht .	281
VI-40	Distribution of Rice Output, in Percent, and Classified by Tenure Class, Nong Sua	284
VI-41	Farmer's Average Income from Non-Rice Activities, in Baht, Nong Sua	285
VI-42	Total Farm Family Income per Year, All Sources, in Baht, Nong Sua	287
VI-43	With and Without Project Projections of Farmer Income, Nong Sua	295
VI-44	Net Income With the Project for both Growing Seasons, According to Cropping Intensities, per Rai, in Baht	296
VI-45	Sensitivity of Income to Changes in Rice Price and Cropping Intensity	297
VII-1	Income Allocation to Production Factors for Vegetable Farming in Ban Na Land Reform Area	302
VII-2A	Income Allocation to Production Factors for Rice Growing in Nong Sua, Wet Season, Cropping Intensity 100 Percent	303
VII-2B	Income Allocation to Production Factors for Rice Growing in Nong Sua, Dry Season	304
VII-2C	Income Allocation to Production Factors for Rice Growing in Wet & Dry Season	305
VII-3	Labor Requirements in Man Hours per Rai for Rice . . .	308
VII-4	Chargeable Amounts for Water Discounted at 8, 10, 12 Percent for Ban Na	311
VII-5	Chargeable Amounts for Water, Discounted at 8, 10, 12 Percent for Nong Sua	312
VII-6	Ban Na: Chargeable Amounts for Water Assuming Increase in Labor Wage of 2 and 3 Percent, per Year, Discounted at 8, 10, and 12 Percent	313
VII-7	Nong Sua: Chargeable Amounts for Water Assuming Increase in Labor Wage of 2 and 3 Percent, per Year, Discounted at 8, 10, and 12 Percent	314

VII-8	Cost Estimates for On-Farm Development, Baht per Rai .	316
VII-9	Costs: At Various Levels of Government Subsidies, Assuming No Interest Charges on Investment in Baht per Rai	318
VII-10	Chargeable Amounts for Water Less O & M Costs for On-Farm System in Ban Na, Baht/Rai	319
VII-11	Chargeable Amounts for Water, Less O & M Costs for On-Farm System in Nong Sua, Baht/Rai	321
VII-12	Cumulative Payments as a Percent of Total Costs, by Assuming Payment of 65 Percent of the Costs by Nong Sua Farmers and Either a Fixed or Variable Schedule	323
VII-13	Chargeable Amount for Land Discounted at 8, 10, and 12 Percent, Nong Sua	327
VII-14	Yearly Income After Charges for Project Recipients in Ban Na and Nong Sua	329
A-1	Land Certificates Held by Owner-Operators in Eleven Central Provinces, 1965	358
A-2	Land Certificates Held by Landlords in Twenty-two Provinces, 1974 - 1977	359
A-3	Landowner and Tenant Cultivators by Region, 1963 . . .	360
A-4	Percentage of Tenant Farmers by Region, 1969	361
A-5	Tenurial Situation by Region, 1968	362
A-6	Land Tenure of Rice Farmers in Twenty-six Central Plains Provinces, 1967	363
A-7	Land Tenure All Agricultural Units in Twenty-two Provinces, 1974 - 1977	364
C-1	With and Without Project Projections for Land Improvement, Ban Na	367
C-2	With Project Projections for Vegetable Farming, Ban Na	369
D	With and Without Project Projections of Farmer Income, Nong Sua	370
E-1	Income Allocation to Production Factors for Vegetable Farming in Ban Na Land Reform Area	373

E-2A	Income Allocation to Production Factors for Rice Growing in Nong Sua, Wet Season, Cropping Intensity 100 Percent	374
E-2B	Income Allocation to Production Factors for Rice Growing in Nong Sua, Dry Season	375
E-2C	Income Allocation to Production Factors for Rice Growing in Wet & Dry Season	376

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
III-1	Land Rent as Depicted by Value Product and Cost Curves	135
III-2	Land Fertility and Land Rents	136
III-3	Land Rent from Different Grades of Land and Same Production Costs	138
III-4	Location and Land Rent	138
III-5	Bargaining Positions and Land Rents	142
III-6	Development Decisions Using Land Rent	143
V-1	Production Function	180
VI-1	Typical Vegetable Farm Layout	269
VI-2	Typical Vegetable Bed, Bed Ditch and Dike System . . .	269

LIST OF MAPS

<u>Map</u>	<u>Page</u>
1 Thailand's Administrative Divisions	25
2 Tenancy Rates of Rice Farmers in Central Plains, 1967 . .	50
3 Tenancy Rates of all Agricultural Units in Central Plains, 1974-1977	51
4 Location of Land Reform Areas	203
5 Ban Na Land Reform Area	207
6 Nong Sua Land Reform Area	208
7 Settlement Plans for Ban Na	266

LIST OF SYMBOLS, ABBREVIATIONS, OR NOMENCLATURE

Units of Measure

Land:	<u>Rai</u>		<u>Hectare</u>		<u>Acre</u>
	1.000	=	0.160	=	0.395
	2.532	=	0.405	=	1.000
	6.25	=	1.000	=	2.471
Weight:	<u>Tang</u>		<u>Kg.</u>		<u>Lb</u>
	1.00	=	10.00 (paddy)	=	22
			1.00	=	2.2

Temperature:

$$C^{\circ} = \frac{F^{\circ} - 32}{1.8}$$

Currency:

1 Baht = \$0.05 U.S.

Provincial and Local Government

Changwat is an administrative unit or province.

Amphoe or district is a subdivision of the Changwat.

Tambon or commune is a subdivision of the Amphoe.

Abbreviations

ALRO	-	Office of Agricultural Land Reform
BAAC	-	Bank for Agriculture and Agricultural Cooperatives
DAE	-	Department of Agricultural Economics, Ministry of Agriculture
FAO	-	Food and Agricultural Organization of the United Nations
NESDB	-	National Economic and Social Development Board
RID	-	Royal Irrigation Department

CHAPTER I

INTRODUCTION

In 133 B.C. the Roman tribune Tiberious Gracchus, probably the earliest recorded land reformer, attempted to carry out land reform to solve pressing rural and urban problems. Large landowners were pushing small farmers off the land, sending them to Rome as unemployed drifters. Gracchus placed a limit on farm size and allocated the remaining land to the displaced farmers and other landless people.¹ Throughout the history of the Byzantine State land reform was a common tool employed by the emperors against the rising power of the aristocracy. During the reigns of Romanus Lecapenus (920-944 A.D.) and Basil II (976-1025 A.D.) land reforms were carried out to protect small landowners, who were primarily soldiers, from a land hungry aristocracy. Basil was much more successful, being able to expropriate land from large landowners and tax what remained in their possession.² Eventually all these reforms failed. Yet, the process of expropriation, size limitation and redistribution was established--to be used repeatedly throughout history in behalf of peasants, seeking secure rights to the land they cultivated.³

¹Paul Conkin, "Agrarianism: A Radical Idea with Its Roots in Ancient Rome Surfaced at Vanderbilt in the 1920's," Vanderbilt Today (July, 1977), p. 3.

²George Ostrogorsky, History of the Byzantine State (New Brunswick, N.J.: Rutgers University Press, 1969), p. 252.

³Kenneth Parsons stresses the importance of possessing secure rights in the following statement:

One of the most successful periods of land reform was from the seventeenth through the early twentieth centuries, when the European feudal system was replaced by an economic and social order which transformed feudal tenure into fee simple ownership and guaranteed the rights of ownership to the peasant class.¹ The most significant land reform movement of this period was the French Revolution, which eliminated the special prerogatives of the landlords.² Ideas of the French Revolution spread across Europe, culminating in the Russian peasant uprisings of 1861, 1905-06 and during World War I.³ The Russian Revolution provided a new alternative for land reform, state or collective ownership, which would influence a number of modern land reforms.

Land reform is still a world issue today. Since the end of World War II, many nations have broken the shackles of colonialism and have set about restructuring their land tenure systems. Land reform in many

"There is a deep belief among peasants . . . that the lands and waters which have sustained them so long are somehow theirs--in a rightful sense To the individual peasant family their hold on the land has long been both the hallmark of their status and the elementary basis of their survival The peasants' attachment to land is not a mere whim or prejudice; it reflects solid judgments of the requirements for survival which have matured through centuries of precarious and rugged living."

In "Land Reform in the Postwar Era," Land Economics, XXXIII, No. 3 (1957), 214.

¹Feudalism as used here has a general, all encompassing meaning. No attempt has been made to delineate between the Western European manorial system, the Eastern European form of serfdom, or the economic interpretation of feudalism. For a thorough examination of these distinctions see Doreen Warriner, Land Reform in Principle and Practice (Oxford: Clarendon Press, 1969), pp. 4-10.

²Warriner, Land Reform, p. 7.

³Raleigh Barlowe, Land Resource Economics: The Economics of Real Property, (2nd. ed.; Englewood Cliffs, N.J.: Prentice-Hall, 1972), p. 525.

of these countries has come to mean more than simply intervening in landownership patterns and control over resource utilization. Today, land reform involves improving other rural institutions, e.g., marketing channels and credit facilities, which will increase agricultural productivity, provide a quality rural life, and nurture a better relationship of people to the land.¹ In developing countries pushing for higher levels of economic development, land resources are key factors in stimulating development. For this reason, land reform is often an urgent piece of business in these countries.

Reasons for land reform vary among developing nations. Conditions, producing tensions in these countries, center on rapid population growth rates, shortage of food supplies, limited availability of nonagricultural employment opportunities, costly new agricultural technologies, greater disparities in income distribution, and a limited land base for expanding cultivation. Confronted with increasing land pressures land reform programs have been initiated in an attempt to alleviate some of these conditions. One country which provides a good example of complications arising from a deteriorating man-land ratio, resulting from a very high population growth rate and a closing of the land frontier, is Thailand. Recently, in response to political pressures, Thailand initiated a land reform program.

¹Confusion exists over the meaning of land reform. The term, agrarian reform, has replaced land reform in many discussions today. Yet, there are certain distinctions, see Barlowe, Land Resource Economics, p. 525. Even though the concept of agrarian reform is more comprehensive than land reform, it has not been used in this paper. Agrarian reform may not involve land reform, if the prevailing landownership pattern is socially, economically, and politically acceptable. On the other hand, land reform needs an agricultural infrastructure which will sustain the new tenure system once it has been established.

Current Pressures of Man on Land in Thailand

Throughout its history, Thailand has been blessed with a bountiful supply of natural resources, land, water, and timber, which have been used to support the country's people and have enabled the country to participate actively in international trade. Like many other developing countries, Thailand faces a problem of increasing population pressures on its land resource base. Population during the 1960's and early 1970's increased at a rate of over 3.0 percent per year--one of the highest rates in the world--reaching a total population of approximately 42,960,000 in 1976.¹ It has only been since 1970 that the government has taken an active interest on curbing population growth.² Since 1975, the growth rate has dropped slightly to around 2.8 percent. Preliminary estimates from the National Economic and Social Development Board (NESDB) indicate that the total population will grow by approximately 13.5 million people between 1975-1985, or an annual increase of 3.1 percent, with rural areas increasing at approximately 2.9 percent and urban areas at 4.8 percent. (Attainment

¹According to the World Bank, Thailand's annual growth rate from 1960 through 1976 was 3.1 percent annually--one of only ten countries over 3.0 percent for that entire period; see Atlas: Population, per Capita Product and Growth Rates (Washington, D.C.: World Bank, 1978). Larry Sternstein places annual growth rates during the early 1970's at 3.3 percent, making them one of the highest in the world except for Mexico and the Philippines (comparing only the 20 most populated countries in the world); see Thailand: The Environment of Modernization (Sydney, Australia: McGraw-Hill, 1976), pp. 42-43.

²The Thai government historically has favored increases in the population of the country. Health services were one of the first services introduced in the countryside. During World War II, the government actively encouraged large families through early marriage and monetary bonuses, in order to increase the power of the country. These practices lasted until 1956. It was only in 1970 that the government, at the urging of the World Bank, sought to support family planning programs (Sternstein, Thailand, p. 42).

of an estimated population of 55.5 million in 1985 would represent a doubling of the population since 1960.)¹

Even with a substantial reduction in the rate of increase, population pressure on the land will continue to increase through the next several decades. The age distribution of the present population shows that nearly 46 percent of the population is under 15 years of age, and will only change slightly by 1990.² An age distribution pattern like this can have a considerable impact on the nation, because only a small percentage of the population is working to support the economy. Over the next few decades, the labor force will continue to grow and be unaffected by any decrease in the population growth rate, because the new entrants are already born. More land and food supplies will be needed to support the labor force and the general population. At this time, the nation's capacity to bring more land into agricultural production is becoming more and more limited. With nearly 86 percent of the population residing in rural areas and four-fifths of the labor force employed in agriculture,³ the problem becomes much more serious.

It is obvious that productive work opportunities must be provided in rural areas to care for much of the expected increase in rural population. What to do with this flow of workers constitutes a national

¹As cited by Charn Kengchen, Land Reform in Thailand, Land Reform Bulletin No. 6 (Bangkok, Thailand: Office of Agricultural Land Reform, 1976), p. 6. Recent figures reported in "Thailand Keeps Lid on Rising Population," The Christian Science Monitor, May 2, 1978, are optimistic, indicating that population growth has been slowed to 2.5 percent, and the government is confident in reaching 2.1 percent by 1981.

²Sternstein, Thailand, pp. 43-45 and H. V. Richter and C. T. Edwards, "Recent Economic Developments in Thailand," in Studies of Contemporary Thailand, ed. by Robert Ho and E. C. Chapman, Research School of Pacific Studies (Canberra: Australian National University, 1973), p. 22.

³Richter and Edwards, "Economic Developments," p. 21 and Sternstein, Thailand, p. 43.

challenge and problem. Some of the problems--both of providing more food supplies and products for export and of providing new rural work opportunities--can be handled by bringing additional lands under cultivation. This has been the answer in earlier periods, but according to the FAO, the amount of arable land in Thailand will grow at only 0.5 percent annually between 1975-1985.¹ To insure reliable water resources, expansion on upland forest areas must be slowed down and more attention given to intensifying uses on existing cultivated cropland.

Thailand's rural environment is strained by a number of pressures which can quickly exacerbate into national crises. Public policies should be developed to ease the impact of these pressures. Policies are needed to facilitate land development and intensification as well as to meet the problem of rural unrest. Consideration should be given to policies for granting land titles, for advancing a sound philosophy of land management, for determining who will benefit from new developments, and for instituting and carrying out land reform measures. The recently enacted Agricultural Land Reform Act, designed to improve the agricultural situation for tenants, subsistence farmers, and landless families, is an example of the type of policy needed to minimize these emerging pressures.

Evaluating the Social and Economic Success of Land Reform

Intensification of agriculture poses a number of physical and biological, economic and institutional issues. Plans for more intensive resource use must be sound from a physical and biological standpoint. They

¹Office of Agricultural Land Reform, The Development of Agrarian Reform in Thailand, Pamphlet No. 8 (Bangkok: Office of Agricultural Land Reform, 1976), p. 1.

must pass the test of economic feasibility and they must be institutionally acceptable. Some of the major issues in Thailand involve institutional constraints.

Private property is often assumed to be the inalienable right of those people who have possession over the objects in question. This assumption can be misleading since the concept of property involves more than the simple relationship between an individual and an object--it encompasses a whole set of social relationships. One of the necessary conditions for private property to exist is the presence of a nation state or sovereign who will guarantee and protect those rights associated with property.¹ Rights to property are, therefore, not absolute because the sovereign can place restrictions on their use or has the option to change the rules concerning their distribution in the future. Land reform strengthens the principle of private property at the lowest level of society resulting in a shift of power within the socio-economic structure.² Success depends on the political will of the government to follow through on the enacted land reform legislation and the flexibility of the social relationships within society to withstand the pressures these shifts in power will bring.

Measuring the political determination behind land reform may be difficult simply because the political process is so complex. Landlords are in a more favorable position to influence the government being organized and in control of the power structure. On the other hand, rural people are seldom organized. Unable to articulate their preferences, tenants have no means of influencing government action through collective efforts. As a

¹Barlowe, Land Economics, p. 376.

²Louis J. Walinsky, ed., Agrarian Reform as Unfinished Business: The Selected Papers of Wolf Ladejinsky (Oxford: Oxford University Press, 1977), p. 11.

result, any pretext for political action may merely be a token expression to placate tenants and minimize rural unrest. The complexity of the political environment hinders attempts to predict the outcomes of alternative implementation strategies and evaluate the overall success of the program.

Other factors make evaluating land reform difficult. The bureaucracy forms a hidden barrier to implementing land reform programs. Programs, being developed by the land reform agency, often conflict with existing programs of other agencies. Established agencies feel threatened and, in an attempt to secure their position, undermine any attempts at coordinating and integrating operations. As functions are duplicated, competition increases between agencies for funds and staff.¹ The bureaucratic structure becomes strained and cannot effectively carry out its mandated functions. Pressures within the bureaucracy are seldom revealed publicly remaining hidden under a traditional blanket of personal relationships. Not accounting for these tensions in an evaluation may lead to faulty conclusions concerning the acceptability of land reform.

Problems arise from conflicts between the various goals of the government. National development plans call for increasing productivity while land reform attempts to improve social equity. Many government officials fear that land reform will reduce agricultural output, jeopardizing domestic and export food supplies. Though temporary declines may occur in production, there is little evidence to suggest that production will decline over the long run. Recent studies have shown that small scale agriculture is more productive than large scale, if support services

¹Peter Dorner, Land Reform and Economic Development (Kingsport, Tennessee: Kingsport Press, Inc., 1972), p. 66.

are available to sustain productivity.¹ Regardless of the success of small farmers, officials tend to protect existing productivity levels and advocate a go slow approach to land reform.

Finally, the analyst faces the problem that no evaluation criteria exists to guide his investigation. Without criteria faulty assumptions can and are made. Since there is not enough knowledge available for correcting these assumptions, it is difficult for an analyst to formulate policy alternatives and evaluate them.

Why would anyone want to undertake an evaluation of a land reform program? Because, an investigation identifies key problems that cannot be ignored and provides modifiable guidelines for future project evaluations. The role of the advisor is not to tell governments what to do. Instead, he provides knowledge on problems that will facilitate decision making.

After the organization of the Agricultural Land Reform Office (ALRO) in 1975, government officials requested assistance in evaluating the land reform program. A grant from the Midwest Universities Consortium for International Activity (MUCIA) provided this researcher with an opportunity to work in Thailand under the conditions described above.

Study Objectives

To understand the objectives of this study, it is necessary to briefly list the objectives established by the ALRO for their reform program.² The objectives are:

¹For specific examples see Michiro Ichikawa, Fight for Asian Farmers: The Political Economy of Land Reform (Tokyo: Asian Development Center, 1976), pp. 82-87; Bruce F. Johnson and Peter Kirby, Agriculture and Structural Transformation: Economic Strategies in Late-Developing Countries (London: Oxford University Press, 1975), pp. 262-67; and Dorner, Land Reform, pp. 110-16.

²Chapter II covers the history of land reform legislation and the development program designed by the ALRO where these objectives are stated in more detail and in proper context.

1. To expand ownership to tillable land by improving the rights tenants, marginal farmers, and other landless people have with respect to the land.
2. To reach a minimum target income of 20,000 Baht for land reform families through a comprehensive development program which includes land and water improvement projects, such as on-farm irrigation structures.
3. To recapture from irrigation recipients, operation and maintenance, construction and other specified costs.

Problem Statement

ALRO decision-makers have an objective of better farmer performance by achieving a specified land tenure policy and improving the agricultural infrastructure, particularly through the expansion of irrigation facilities and the establishment of cooperatives. Project beneficiaries are required to reimburse the government for irrigation investments made in their behalf. Presently, no guidelines for recapturing investment monies have been established by the government. Obviously causing the ALRO some concern, a study was requested of possible cost-recovery strategies which could be adopted by the ALRO.

To accomplish this task, additional information was needed on the institutional setting of land reform. Various organizations and cultural and social practices will influence the outcome of land reform projects. Cost-recovery is a new concept which conflicts with traditional ideas. Unless it is compatible with existing institutions, a cost-recovery strategy cannot be easily adopted. Identification of the principal actors and their behavior patterns is necessary prior to investigating cost-recovery.

Study Approach

To obtain the information needed on the institutional setting of land reform and the repayment capacity of project beneficiaries, this study undertakes a comprehensive analysis of the land reform program. A

comprehensive analysis provides the means to evaluate the current situation and possible alternative courses of action a public agency can take to achieve its objectives. Some of the variables considered in comprehensive analysis include policy congruence, environmental impact, economic feasibility, social and political acceptability, equity, uncertainty and bureaucratic compatibility. This means that contemplated public actions, regardless of legal authorization, must be in accord with existing public policy, must be environmentally sound, must generate more benefits than costs, must be acceptable to both the political establishment and the participants of the proposed project, must attempt to reduce inequalities in income, minimize uncertainty among participants caused by introducing new programs, and must be compatible with existing organizational arrangements and bureaucratic capabilities. These factors are all considered because public programs produce a number of effects, which some techniques, i.e., benefit-cost analysis, may not be able to measure or recognize. The point in using this approach is to recognize that land reform takes place in a diverse system and, by clarifying the situation the decision-makers are more flexible in selecting the proper course of action.

To isolate these factors, this study has been divided into two parts. The first part examines the institutional setting to see if the land reform program is socially, culturally, and politically acceptable and bureaucratically compatible within the existing framework of society. In the second part, the cost-recovery study analyzes the environmental parameters, economic feasibility, uncertainty, and equity issues involved in the proposed ALRO projects. Together, these two sections identify possible courses of action, describe possible behavioral responses of the various participants, and provide a guideline to choose between various alternatives.

Institutional setting. Institutions, either established organizations or practices, provide a framework for conducting and implementing public policy. They influence how individuals and groups will behave in certain situations. "They can make for progress or be an obstacle to progress."¹ Traditional customs and programs are difficult to change and often hinder project implementation.

Another important set of institutions which must be considered are the institutions which make up the agricultural infrastructure. Without these institutions, the land reform program will break down over time. These institutions are examined in order to identify their strengths and weaknesses and to determine if they will aid or hinder the success of the program.

Cost-recovery. Irrigation development is an expensive venture. Private funds are not usually available for such investments and, therefore, the public sector becomes the logical source for project funds. Depending on the size of the project, initial investments can exceed the financial means of the government and, thus, seriously affect other rural development projects. Initial projects begun by the ALRO will be small in scope. Yet, investment outlays will be needed to develop the low quality resource base found in a number of land reform areas.

The Land Reform Act serves a specific audience. The various projects will improve the welfare of some, but not all residents, in the same localities. Unlike other rural development projects, such as health programs, the beneficiaries of an irrigation project can be easily identified. For reasons of social equity, these beneficiaries can be charged for the public investment made in their behalf.

¹v. Webster Johnson, Land Tenure and Associated Institutions: Report to the Government of Thailand (Rome: FAO, 1969), p. 11.

Cost-recovery studies can provide useful data for both the beneficiaries and the agencies in charge of projects. Data from these studies can be used to inform recipients about the benefits they receive from projects and what their responsibilities are. Using concepts from land rent theory and resource investment theory, a simple graphic display will show the recipient how the benefits have been allocated to the different factors of production: capital, labor, management, land, and water. From those benefits assigned to water, reasonable charges can be applied for defraying investment costs.

Cost-recovery studies can also provide sets of guidelines, under various conditions, that government officials can use to determine farmer repayment capabilities.

Specific Study Objectives

The specific objectives of the study are:

1. To examine the institutional setting of land reform by identifying the major actors involved in the reform program and the factors influencing their behavior.
2. To assess the capability of recipients under various conditions, e.g., different interest rates, length of repayment period, to repay operations and maintenance, construction, and other specified costs.
3. To provide guidelines for establishing a cost-recovery policy by providing information on the issues of why charges are levied, what services they relate to, upon who they should be levied, how charges should be implemented, and how much should be collected.¹
4. To evaluate the proposed development schemes for the project areas under study, and make suggestions on possible alternatives, if appropriate.

¹These questions were raised in a World Bank report on cost-recovery and were deemed very appropriate for this study. See Paul Duane, A Policy Framework for Irrigation Water Charges, Bank Staff Working Paper No. 218, July 1975, p. 1.

Relevance of Findings

It is hoped that the findings from these areas can be used by policy makers. Four significant values of the findings are visualized:

1. The identification of possible institutional obstacles to land reform will enable ALRO officials to develop more flexible strategies to minimize the constraints presented by these obstacles, and insure the success of the land reform project.
2. The amount of investment recovery and the length of time required for repayment can give governmental advisors necessary information for making decisions on future capital expenditures on land reform.
3. If the ALRO seeks funds from the World Bank, a cost-recovery report must accompany such a request. This report will save the ALRO valuable time in applying for loans.
4. Involvement in a cost reimbursement program will cause beneficiaries to assume improved attitudes toward government sponsored projects. This will come about as the beneficiaries weigh the benefits they receive against their responsibilities within the project. At the same time government officials have opportunities to understand the recipients better. This better understanding will help facilitate project implementation.

Organization of Study

This paper examines four major aspects of the larger study.

Chapter II is a historical review of the land tenure system prior to land reform and the land reform legislation enacted in 1975. In Chapter III, the actors and institutions involved in implementing land reform are identified as well as an explanation of how their behavior may possibly affect the implementation of land reform. Chapter IV discusses alternative approaches for studying cost-recovery. In Chapter V, costs and benefits as they relate to the project are identified and the criteria to be used in the cost-recovery analysis are established.

The analysis is conducted in Chapter VI and VII. Chapter VI explains how the study areas were selected and describes the agricultural situation

found in the study areas of Ban Na, Nakorn Nayok and Non Sua, Pathum Thani. Farm budgets have been prepared under 'with-without' conditions. Benefits accruing to project participants are determined from these farm budgets. Cost-recovery analysis is applied to both areas and the results are presented in Chapter VII. Summary, conclusions, and recommendations are presented in the final chapter.

CHAPTER II

PUTTING LAND TENURE AND LAND REFORM IN PERSPECTIVE

In order to put land reform in proper perspective, land reform program are isolated tenancy conditions as they existed prior to the enactment of the land reform program. Also, it would be appropriate to present the principal provisions of the land reform law and other legislation which are presented. With this historical background, the evaluation of selected land reform projects to determine the participants repayment capacities and the examination of the institutional setting is undertaken.

Thailand's Land Tenure Situation

Throughout the nineteenth century, Thailand enjoyed a situation unlike that faced by her neighbors. Thailand never experienced political domination by a world power, be it European, American, or Asian. This did not mean that the nation was not influenced by the colonial powers. An apt phrase 'almost colonial'¹ refers to the signing of the Bowring Treaty with Britain in 1856, which brought Thailand into the colonial economic system. For example, France and Britain were able to apply enough pressure on the Thai monarch so that large land cessions were granted to them, enlarging

¹Ammar Siamwalla, "Stability, Growth and Distribution in the Thai Economy," in Finance, Trade and Economic Development in Thailand: Essays in Honor of Khunying Suparb Yossundara, ed. by Prateep Sondysuvan (Bangkok: Sompong Press, 1975), p. 32.

their colonial empires. The nation continued to operate under this system until the beginning of World War II.

Significantly, the Thais benefitted from the absence of colonial administration in one important area, land policy. Instead of inheriting a plantation system similar to those found in Malaysia, Indonesia, and Vietnam, Thailand's land policy favored small landowners. Though it will be shown below that land ownership in many cases is only superficial due to a complicated titling procedure, the favorable man-land ratio, until recently, insured that farms would be small and land would be available to anyone wishing to farm.

Land Ownership Code

Landed property is composed of a number of distinct rights held together in the form of a bundle. Under fee simple ownership, the owner possesses all the rights associated with the property except for certain limitations imposed by the state. Tenure arrangements divide the bundle of rights between the tenant and the landlord in some prescribed manner. To the tenant and the landless individual, owning property represents security and control of an undivided bundle of rights. The opportunities for extending one's control over property depends on the procedures for obtaining title deed, or legal recognition that the cultivator holds the land in compliance with state regulations.

For most Thai peasant farmers, the concept of land ownership has evolved from a process of merging customs followed for generations with the state's legal land laws. At best, only a few farmers understand the land code as it is now written. Most farmers follow the old custom which recognizes that all the land belongs to the king, with the farmer being allowed to occupy land and cultivate it. Through continuous

cultivation, individual property rights have become associated with the land. One of the king's duties was to protect the well-being of the people, guaranteeing free access to land and protecting the rights associated with the land was the best means to fulfill this responsibility.

During the reign of Chulalongkorn, a new concept of land ownership was introduced which distinguished between occupancy and ownership.¹ Legal protection was extended to ownership, but not to occupancy. This new arrangement led to much confusion over tenure and the rights of squatters.² Even with new revisions in 1936 and 1954 which recognize occupancy, utilization, and legal possession as stages to full ownership,³ many rural peasants still do not understand the land code and some have found that the land they thought to be their own was actually deeded to another party.

According to the current land code, the procedure to acquire full ownership proceeds in three stages. First the tiller must apply at the district office for a reserve license (Bai Chong) or the right to occupy unused land for three years. There is no security of tenure given with this license and, at the end of three years the occupant can be asked to leave although, this is seldom done. After 75 percent of the land has been brought under cultivation an exploitation testimonial (Nor Sor Sam) is issued after the district officer substantiates the claim. Testimonials are permanent and can be inherited though there are a number of restrictions placed on them, e.g., they cannot be used as collateral for a bank loan. Finally, the title deed (Chanot Thidin), giving fee simple rights, is issued

¹Toro Yano, "Land Tenure in Thailand," Asian Survey, VIII (October, 1968), 853.

²Edward Van Roy, Economic Systems of Northern Thailand: Structure and Change (Ithaca: Cornell University Press, 1971), p. 187.

³Yano, "Land Tenure," p. 854.

upon completion of a cadastral survey. This last step is often delayed and is the main reason so few farmers have title deeds.¹

Many farmers, unfamiliar with or unable to understand the legal procedures, follow the ancient practice of Chap Chong, settling and cultivating unoccupied land. Over a long period of time, the tiller believes he has customary rights to the land. To the government, the Chap Chong farmer is a squatter. Since the tiller cannot legalize his rights to the land, this is a precarious position. He may be evicted or find his claim usurped by someone more knowledgeable of the titling process.

The government seldom evicts a farmer once he begins cultivating the land. Ironically, the government will issue these farmers a soo khloo 1, a form for reporting land occupation. This document has nothing to do with land titling. It is required of all farm families for tax purposes. Many farmers, unfortunately, consider this document to be the actual land title and use it as a legal document in land transactions.²

Within the land code, a distinction is drawn between state land and undeveloped land. State land includes forest land, usually in sections larger than 1,000 rai.³ Undeveloped land is considered land, presently uncultivated, which is located near farm communities. These latter plots are usually smaller than 1,000 rai.⁴ Although the government has

¹For a more thorough explanation of the land certificate system see Yano, "Land Tenure." Chaeyong Chuchart, Principles and Practices of Land Planning and Development in Thailand, Land Economic Report No. 6 (Bangkok: Land Policy Division, Land Development Department, Ministry of National Development, 1971), pp. 3-4; A. N. Seth, "Report on Land Reforms in Thailand," in Proceedings of National Seminar on Land Problems and Policies in Thailand (Bangkok: Ministry of National Development, 1970), pp. 151-52; and Boonpoom Senarak, "Land Alienation of the Farmers: A Case Study in Amphoe Bangmuor Nak Changwat Pechit: Prior to 1974," (unpublished Masters Thesis, Thammasat University, 1976), pp. 132-33.

²Yano, "Land Tenure," p. 855. ³2.5 rai = 1 acre

⁴Senarak, "Land Alienation," p. 132.

attempted to curtail clearing of forest lands by protecting at least 40 percent of the nation's forest, either area can be allocated for settlement. So far, this policy has not been successful and the forests are being cleared at an alarming rate.

Little information is available indicating how much land is under some form of titling document. Cadastral surveys have not been completed for major portions of the country. Only the Central Plains region has been extensively surveyed. Ingram presents some sketchy figures reporting that 12 percent of the farm holdings have full title while 65 percent have no type of document at all.¹ Chaityong Chuchart estimates, that of 28 million acres under cultivation, only 6 million (21 percent) are under title deeds, 4.5 million (13 percent) are under exploitation testimonials, and 1 million (3 percent) are under reserve licenses. For approximately 16.5 million acres (63 percent), farmers do not have any recorded land rights.²

In a 1969 survey of eleven selected Central Plain provinces, the Land Development Department found that 76 percent of the owners possessed title deeds, while 15 percent and 9 percent held reserve licenses and exploitation testimonials, respectively. In the provinces closest to Bangkok (Thonburi, Smut Prakarn, Chachoengsao, Nakorn Pathom) nearly a 100 percent of the landowners held title deeds. Moving farther away from Bangkok, the number of title deeds held fell off sharply, while other forms of land certificates increased. In Karnchanaburi and Chainat, more

¹James C. Ingram, Economic Change in Thailand: 1850-1970 (London: Oxford Press, 1971), p. 266.

²Chuchart, Principles, p. 4.

than two-thirds of the land was being held under reserve license.¹ This data has been presented in Appendix A-1 and the provinces can be located on Map 1.

A recent survey of 22 provinces, mainly located in the Central Plains, by the Land Policy and Planning Division of the Department of Land Development showed that landlords² residing in provinces close to Bangkok possessed title deeds (approximately 90-100 percent of the landlords), while in provinces further removed from Bangkok landlords possessed exploitation testimonials or land tax receipts.³ In the most remote provinces, the land tax receipt is the most common form of document. The survey did not look at the titles of owners who operated their own farms, but it can be assumed that the pattern would be very similar. Exact figures for selected provinces can be found in Appendix A-2 and provinces can be located on Map 1.

Individual studies tend to support these general findings. Yano found that 89 percent of southern farmers possessed only land tax receipts and none had any type of land certificate which would protect tenure.⁴ Senarak in studying the irrigation areas of the Bangmun Nak district of Phicit (northern Central Plains) reveals that 46 percent of farm operators have title deeds, 20 percent reserve licenses, and the remaining 34 percent have various other types of certificates,⁵ probably land tax receipts.

¹Department of Land Development, Relation of Land Tenure and Production in 11 Provinces in the Central Plains, 1965 (Bangkok: Ministry of National Development, 1969).

²Landlord is defined as a person who does not operate his/her own farm land, but instead rents his/her land out with or without returns.

³Division of Land Policy and Planning, Agricultural Land Tenure Survey (Bangkok: Department of Land Development, 1974-1977).

⁴Yano, "Land Tenure," p. 855. ⁵Senarak, "Land Alienation," p. 35.

Though reporting no figures, Moerman points out that farmers will underreport land holdings to government officials to avoid paying land taxes.¹ This is only true for land located in one's own village where the actual boundaries are recognized by kinsmen and rights are guaranteed by village headmen. When farmers have expanded their holdings by opening new land located some distance from their village and strangers are also opening new lands in the same area, correct property descriptions are given to officials. The act of underreporting seems to be quite common. Underreporting raises some doubt as to the actual amount of land under various types of land certificates, indicating that a large percentage of the cultivated land is not registered and is therefore, by definition, public domain.

In summary, it appears that landowners located nearest the urban center of Bangkok or in the fertile river valleys, especially in the North and Central Plains have acquired land certificates which guarantee their rights in the land. Apparently, farmers in the marginal areas have not initiated land title procedures. Part of the problem stems from the unclear titling procedure which many farmers do not understand. Farmers also avoid paying taxes by not reporting all their land holdings. Finally, a title deed requires that the land be surveyed. Outside the Central Plains, only about 5 percent of the land has been surveyed slowing down the process of converting reserve licenses into testimonials and, then, into title deeds.

Land Tenure

Without a good land titling system, it is very difficult to draw an accurate picture of the present land tenure situation. For a long time,

¹Michael Moerman, Agricultural Change and Peasant Choice in a Thai Village (Berkeley: University of California Press, 1968), p. 99.

tenancy has not been considered a serious problem. Many observers describe the country as a land of small independent farmers who own the land they operate. Since approximately 80 percent of the farmers do not have title deed to the land they operate, this description is a myth. Only in the heart of the Central Plains can this statement be considered appropriate and even there it may not be true.

In a 1930 survey, Zimmerman indicated that the number of landless people ranged from a low of 14 percent of the population in the South to a high of 36 percent in the Central Plains.¹ DeYoung's 1949 study of San Pong village in the North reported a tenancy rate of 28 percent.² In 1950, Dobby reported a landless rate of 85 percent in Rangsit.³ In Bang Chan, an often studied village near Bangkok, Janlekha found the tenancy rate to be 37 percent in 1955, and during the period from 1948 to 1953 that agricultural land values increased 560 percent.⁴ These scattered reports did not generate any concern over tenancy because small population growth and plenty of land available for cultivation diffused any potential tenancy problems. In fact, eradication of malaria in upland areas after World War II opened new lands⁵ for settlement reducing population pressures building up in the Central Plains. Agricultural surveys in 1950 and 1963 found tenancy to be the highest in the Central Plains at

¹Carle C. Zimmerman, Siam: Rural Economic Survey, 1930-31 (Bangkok: Bangkok Press Times, 1931), pp. 17-19, 25-36.

²John E. deYoung, Village Life in Modern Thailand (Berkeley: University of California Press, 1955), p. 76.

³E. H. G. Dobby, Southeast Asia (London: University of London Press, 1950), p. 277.

⁴Kamol Odd Janlekha, "A Study of the Economy of a Rice Village in Central Thailand," (unpublished Ph.D. dissertation, Ithaca, N.Y., 1955), p. .

⁵Siamwalla, "Stability, Growth and Distribution," pp.34, 36, and 44.

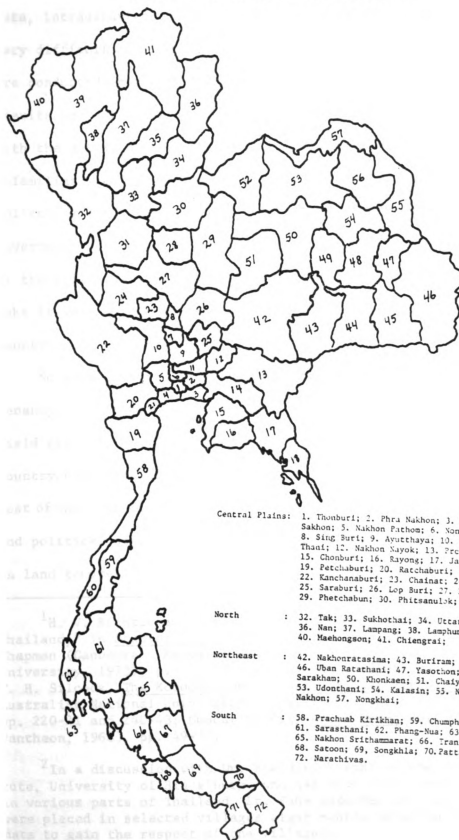
14¹ and 23 percent (Appendix A-3), respectively; still too insignificant to cause serious governmental intervention in the matter, except for a weak and unenforceable rent control act passed in 1950.

Since 1965 when the Land Policy Division conducted a new survey in selected Central Plain provinces and showed tenancy to be higher than previously expected, government officials have considered doing something about the prevailing land tenure situation. One problem in arriving at an agreeable land policy has been that the data collected in selected areas cannot be generalized to cover the whole country. Thailand can be generally divided into four regions, South, Northeast, North, and Central Plains (see Map 1), for discussion purposes. Each of these regions has different cultural and social traditions and land related problems. For the purposes of this paper it would be useful to look at each of the regions separately. Most attention will be given to the Central Plains and the North because of the long government involvement in the problems of these areas and their high degree of commercialized agriculture. Over the last ten years, the government has been increasingly active in the Northeast in order to retain rural stability in face of increasing pressure from communist-backed guerillas and insurgents. The southern provinces still do not receive much attention from the central government in Bangkok.

A comment is in order concerning the data used in this report. Government statistics are open to question. Various government agencies produce information on the same topic with widely varying and unexplainable differences. Discrepancies can be attributed to differing methods of

¹Ingram, Economic Change, p. 267.

Map 1
Thailand's Administrative Divisions



Central Plains: 1. Thonburi; 2. Phra Nakhon; 3. Samut Prakan; 4. Samut Sakhon; 5. Nakhon Pathom; 6. Nonthaburi; 7. Ang Thong; 8. Sing Buri; 9. Ayutthaya; 10. Supan Buri; 11. Pathum Thani; 12. Nakhon Nayok; 13. Prachinburi; 14. Chachoengsao; 15. Chonburi; 16. Rayong; 17. Sam Chaburi; 18. Trat; 19. Petchaburi; 20. Ratchaburi; 21. Samut Songkram; 22. Kanchanaburi; 23. Chainat; 24. Uthai Thani; 25. Saraburi; 26. Lop Buri; 27. Nakhon Sawan; 28. Phichit; 29. Phetchabun; 30. Phitsanulok; 31. Kamphaengphet;

North : 32. Tak; 33. Sukhothai; 34. Uttaradit; 35. Phrae; 36. Nan; 37. Lampang; 38. Lamphun; 39. Chiangmai; 40. Mae Hongson; 41. Chiangrai;

Northeast : 42. Nakhonratchasima; 43. Buriram; 44. Surin; 45. Sisaket; 46. Ubon Ratchasani; 47. Yasothon; 48. Roi-et; 49. Maha Sarakham; 50. Khonkaen; 51. Chaiyaphum; 52. Loei; 53. Udonthani; 54. Kalasin; 55. Nakhon Phanom; 56. Sakon Nakhon; 57. Nongkhai;

South : 58. Prachuab Kirikhan; 59. Chumphon; 60. Ranong; 61. Sarasthani; 62. Phang-Nua; 63. Phuket; 64. Krabi; 65. Nakhon Srithamarat; 66. Trang; 67. Phthalung; 68. Satoun; 69. Songkhla; 70. Pattani; 71. Yala; 72. Narathiwat.

evaluation, especially aggregation.¹ This makes the figures doubtful and subject to bias. The problem is not confined to interdepartmental data, intradepartmental data also suffers from the same problem. It is very difficult to find good benchmark data because successive surveys are conducted in a different manner making it difficult to compare results and establish trends. Another problem in recent years has to do with the actual data collection. Enumerators are inadequately trained and unfamiliar with the subject matter, e.g., land tenure, on which they are collecting data. At the same time, rural interviewees are suspicious of government officials, but especially of college age enumerators because of the political activism associated with this age group.² These problems make it very difficult to collect, collate, and evaluate data in the country.

No area suffered more from poor data evaluation methods than land tenancy. In order to provide some credibility to government sources, field studies, conducted by various researchers in different parts of the country, have been used to verify or elaborate on government statistics. Most of these studies have been undertaken by sociologists, anthropologists, and political scientists whose research interests were not specifically in land tenure. To some degree, each observer has incorporated some land

¹H. V. Richter and C. T. Edwards, "Recent Economic Developments in Thailand," in Studies of Contemporary Thailand ed. by Robert Ho and E. C. Chapman (Canberra: Research School of Pacific Studies, Australian National University, 1973), p. 17. For additional comments on data problems see T. H. Silcock, The Economic Development of Thai Agriculture (Canberra: Australian National University Press, 1970), pp. 6-11; Ingram, Economic Change, pp. 220-21 and 240-43; Gunnar Myrdal, Asian Drama Vol. 1 (3 vols.; New York: Pantheon, 1968), pp. 49-70.

²In a discussion with Dr. Frederick Fuhs of the Southeast Asian Institute, University of Hiedelburg who has been conducting manpower surveys in various parts of Thailand, Dr. Fuhs informed me that college age enumerators were placed in selected villages eight months prior to the collection of data to gain the respect of the villagers.

in this paper. Additional information is derived from the author's observations, based on travels throughout Thailand. These observations have helped to clarify some of the ambiguities surrounding the land tenure situation.

South. Commonly referred to as Peninsular Thailand, the South is a mountainous region, an extension of the Western Range, with narrow valleys which widen into alluvial plains, especially along the eastern coast. The ridges form a unique natural feature in that many peaks arise abruptly from the alluvial floor. In the picturesque Phuket area peaks rise dramatically out of the ocean. The deep alluvium soils provide a good base for agriculture, but the extent of these soils is limited. Upland soils tend to have a high clay content and are slightly acidic because of leaching. Southern Thailand has a tropical monsoon climate, with heavy rainfall and only a short dry season. The major agricultural crops are rice, rubber, coconuts, fruit and oil palm which respond best to the area's soil and rainfall.

The government has shown little concern for the problems of the South, except for challenging the increasing hostility of Thai-Muslims toward the government and the encroachment of communist guerillas wandering back and forth across the border with Malaysia. No studies have been made which thoroughly examine the land tenure situation in this region. Both V. Webster Johnson and Chaiyong Chuchart allude to pressing tenancy problems in the South, especially among the rubber growers.¹ No information has been produced which substantiates these pronouncements. In fact, the government, in an effort to keep the Chinese from operating large plantations, has placed

¹Johnson, Land Tenure, p. 19 and Chuchart, Principles, p. 17.

size limitations on rubber farms and encouraged small-scale Thai rubber growers.¹

The 1963 Agricultural Census reported that approximately 16 percent of farm households were tenants (Appendix A-3). This figure may not be completely accurate because part owner-tenants were not treated separately and were assumed to be classified as owners. In 1969, the National Statistical Office reported a tenancy rate of 14 percent for the region (Appendix A-4). Again, part owner-tenants were not classified separately. No survey work has been done in this area by the Land Policy Division or other land related agencies.

Using the National Statistical Office's data, Adul Niyomwipat found the tenancy rate to be 7 percent for full tenants and 9 percent for part-owners (Appendix A-5). Higher rates of tenancy were found in selected provinces especially Phuket where the tenancy rate was 30 percent. This particular situation can possibly be attributed to land speculation because Phuket is a popular tourist and resort area, but no data is available to substantiate this possibility.

In his survey of Songklaa province, Yano looks only at the acquisition of title deeds. No mention is made of the actual tenancy situation, but Yano suggests that tenancy is not a problem because arable land is available for cultivation. In fact, the southern region is the only region in Thailand with a generous supply of unused land. The Public Welfare Department has been very active in appropriating unclaimed land for the purpose of establishing land settlements and moving people from the crowded provinces in the Central Plains and Northeast. These settlements

¹Sein Lin and Bruce Esposito, "Agrarian Reform in Thailand: Problems and Prospects," Pacific Affairs, IL, No. 3 (1976), p. 433.

have received international monetary support to expand and diversify agricultural production especially in the areas of rubber and oil palm.

Still, the Land Settlement Division has been faced with the major problem of what to do with squatters. During visits to various land settlements in the South, project directors complained of squatters moving on publicly claimed land and the difficulty in removing them. This situation should be expected since squatters are following the traditional practices for acquiring land.

Though the land tenure situation appears favorable in the South, there are a number of problems building up in the area. As squatting becomes more common, for whatever reason, conflicts are bound to arise especially between squatters and government agencies. Squatters may come in conflict with other parties as well. Since many squatters settle on any unclaimed land without notifying local and district officials, there is no way to know if another party has already claimed this same property. This is a common happening, as will be pointed out in the section on the Central Plains, and the squatter has no rights to protect his homestead. Squatting presents another problem in that it follows no prescribed pattern with farmers being allowed to cultivate wherever they desire. This type of action threatens the integrity of the physical environment because random, unsupervised deforestation jeopardizes the water supplies needed in wet-rice cultivation. Since the South is very mountainous, unplanned settlement can lead to very serious water supply problems.

As population pressures from external (migration) and internal sources continue to grow, squatting will present more problems because the squatter

will be competing with many others for usable land. A time will come when renting will be the only way some families will have of acquiring the resources for survival.

Northeast. This region is the largest of the four regions both in area and population. Commonly referred to as the Khorat Plateau, the Northeast is rolling land of low relief broken with low hills. It is separated from the Central Plains by the Phetchebun and the Dong Phya Yen mountains. The area is part of the Mekong watershed, with only two major rivers, the Mun and the Chi. The soils are sandy, shallow in depth, and low in fertility. Soil erosion is a very serious problem with some land being abandoned.¹ The Soil Survey Department recommends that certain soil series in the region should not be cultivated.² Because of population pressures, however, much of their low grade land is cultivated and is used for subsistence production.

The most serious environmental condition is the climate. The temperatures are uniformly high throughout the year, averaging 22.9 C.³ High temperatures are a constraint to agriculture when rainfall is not evenly distributed. Uneven rainfall pattern hinders agricultural development. Most of the region's 1200 to 1500 mm. of rain falls in two periods, May to June and September. The rest of the year is relatively dry and domestic and agricultural water supplies are very scarce. High temperatures evaporate the water, and dry out the soil so that it resembles concrete. Under these conditions, the soil can be worked only after

¹Ronald C. Y. Ng, "Some Land-Use Problems of Northeast Thailand," Modern Asian Studies, I, No. 4 (1970), p. 24.

²See Land Classification Division, Soil Interpretation Handbook for Thailand (Bangkok: Department of Land Development, 1975).

³Ng, "Land-Use Problems," p. 24.

prolonged soaking. Other problems with the rain are its irregular time of arrival and wide annual fluctuations in total precipitation.

The physical environment has much to do with determining the land use patterns in the region. In order to minimize risk, farmers cultivate several parcels of land located in different areas; preferably one area involves lowland suitable for wet-rice cultivation, while other tracts are upland suited for cash crop production. With improved communications and transportation facilities, farmers are gaining better access to markets making their upland areas much more valuable. Commercial agriculture and a rapidly increasing population are both putting pressure on the land resource base.

Tenancy has never been a serious problem in the Northeast. The Agricultural Census of 1963 reported a tenancy rate of 10 percent, not including part-owners (Appendix A-3). In 1969, the National Statistical Office revealed that the tenancy rate was an insignificant 3 percent (Appendix A-4). Adul supports this low figure (Appendix A-5). His selected provinces are slightly higher, e.g., Khorat, 5.4 percent, and can be explained by the fact that these are highly populated river valley areas.

Individual studies support the fact that tenancy is not much of a problem. A 1963 study of three Northeast provinces conducted by the Division of Agricultural Economics, reported that 93 percent of land cultivated was owned, while 7 percent was rented.¹ Though this report claimed that 91 percent of the owned land was under title document, the term "owned" is misleading. Ng reports that only 54,000 title deeds were

¹Division of Agricultural Economics, A Study on Agricultural Economic Conditions of the Farmers in the Provinces of Roi-Et, Mahasarakam and Kalasin in 1962-1963 (Bangkok: Ministry of Agriculture, 1963), p. 9.

issued for the entire Northeast from 1943 to 1964 and most of the land is operated under permit from the government. Many of these permits are either tax receipts or reserve licenses, neither of which give the farmer ownership rights to the land.¹ The increased activity of the Land Department in the region over the last few years would suggest that more is being done to improve farmers' property rights.

In a much more in-depth socio-economic survey, Janlekha² found in the village of Saraphi that 7 percent of the families were landless. Forest land was available only needing to be cleared; still these families preferred not to occupy any land, either because they had cash-earning jobs, desired to work as farm laborers, or they were waiting for parental gifts. Only 3 percent of the farms rented all their land while 12 percent were part-owner tenants. Of the land under cultivation, only 10 percent was rented. The socio-economic conditions of Saraphi can be considered a fairly accurate description of the rest of Northeast Thailand.

Just because tenancy rates are low in the region does not mean that there are not some serious land related problems. Three general problem areas exist: land inheritance, land fragmentation, and the poor condition of the natural environment. Local inheritance customs conflict with Thai law, which states that all property will be divided equally among all children. In the Northeast, inheritance is usually through the daughter(s),³ though there are variations. Generally, a daughter will bring her husband

¹Ng, "Land-Use Problems," pp. 26-27.

²Kamol Janlekha, "Saraphi: A Survey of Socio-Economic Conditions in a Rural Community in Northeast Thailand," in The World Land Use Survey ed. by Lee Audley Stamp and Ian H. Cox, Occasional Paper No. 8 (Cornwall: Geographical Publications, Ltd., 1968).

³H. Demain and C. J. Dixon, "Land Tenure Patterns and Agricultural Development in Northeast Thailand: A Case Study of the Lam Pao Irrigation Area in Kalasin," Journal of the Siam Society, LX, Part 2 (1972), p. 51.

to her family's home to live until her inheritance becomes due. There is a degree of uncertainty in this system because the young couple is not sure when they will inherit property or exactly how much; some land is given to other children as wedding gifts, or the property is divided among several daughters. Demaine and Dixon found that approximately 40 to 70 percent of the land in Kalasin province was acquired through inheritance, the rest through purchase or clearing unclaimed land.¹

The features of this inheritance system raise problems. First, many young men are un- or underemployed while waiting for their wife's inheritance. A large number of these men have complained to the government about not being able to earn a sufficient income to support their families. Second, parents have subdivided their property, giving plots to their children, or have given small parcels to sons-in-law. Subdivision encourages fragmentation.

Fragmentation has never been considered a serious problem because of the abundance of unclaimed land which a farmer could clear and cultivate. The man-land ration is only 52 persons per square kilometer, which suggests there is a lot of land to utilize. But Keyes points out an important distinction, by considering only cultivated land the "nutritional density" is 242 persons per square kilometer.² Considering this relationship, fragmentation could be a more serious problem. Good land is difficult to find, most is already in cultivation. An average size plot is only 14 rai³ enough to produce slightly above subsistence level. If population pressures continue to intensify, fragmentation could increase as each family attempts to have a variety of land types to insure subsistence.

¹Ibid., p. 50.

²Charles F. Keyes, "Isan in a Thai State: A Brief Survey of the Thai 'Northeastern Problem'," draft version (Ithaca: Cornell University, 1965), p. 8

³Jankela, "Saraphi," p. 33.

Increased fragmentation and population pressures will be compensated by the extension on unclaimed land, but the remaining land is very marginal and low yields can be expected reflecting the poor conditions of the soil and the uncertainty of the annual water supply. The physical limits of this region sustain a land tenure system dependent on climatic conditions and puts restraints on the available frontier upon which farmers can move on. Even the financial incentives of commercial agriculture which is spreading in the region have done little to affect this pattern.¹

Government rural development activities have significantly increased in this area. Projects of regional importance have included the irrigation development of the Mun and Chi river valleys. As irrigation facilities are extended to farmer's fields, there is more confidence that water will be available throughout the cropping season. This new confidence in being able to control the environment has slowly changed attitudes toward land ownership. Successful farmers are slowly buying up land to expand their farms. Also, there are highly conjectural rumors that outsiders are buying up land from farmers who do not have the capital to maintain or undertake commercial operations. In visiting this area, the author has been able to verify that land transactions have increased, but no one would reveal who was purchasing the land. Irrigation development will be limited to a relatively small area because of physical constraints and land transactions should be monitored to insure that tenancy and absentee landlordism will not rise.

North. The northern region of Thailand is a mountainous region, with the ranges separated by broad river basins. These mountains are the

¹Demaine and Dixon, "Land Tenure Pattern," p. 58.

headwaters of rivers, e.g., the Ping and Nan which flow southward to join together to form the Chao Phraya river. Depositing a large amount of soil on their movement southward, the river delta are very fertile agricultural areas. With double and triple cropping, cropping intensity on some farms is as high as 1.97¹ and increasing as new crops and farm management techniques are being introduced.

One of the most important resources of this region is the forest land which forms the major forest reserves of the country. The forest cover at lower elevations is deciduous trees, generally teak, which grow on poor soils. Much of this forest has been cut for its timber and is being cleared for cultivation by valley farmers. At higher elevations are the evergreen forests and some tracts of fertile soil which support the hill tribes who engage in swidden agriculture.²

To completely understand the land tenure situation in this region, three groups have to be examined: (1) the valley farmers, who cultivate wet-rice and other crops; (2) the lowland Thai who has moved into the upland areas, growing tea, dry rice, and other crops; and (3) the hill tribe people. Throughout history the hill tribes and valley residents seldom interacted because the deciduous forests erected a natural buffer between these groups. The pressure of rising population, especially in the valleys, have increased the tension and violence³ between the lowland

¹Alan R. Thodey and Peter LaRamee, Ban Pa Mark, Northern Thailand: Results of a Daily Record Keeping Study, 1973-74, Agricultural Report No. 4 (Chiang Mai: Faculty of Agriculture, Chiang Mai University, 1974), p. 45.

²For a more thorough examination of the geography of this region see Edward Van Roy, Economic Systems of Northern Thailand: Structure and Change (Ithaca: Cornell University Press, 1971), pp. 19-23.

³Ian and Esposito, "Agrarian Reform," p. 430.

people and the hill people. Much of the attention in this section will focus on developments in the lowlands and their impact on the upland regions.

Agriculture is a very ancient activity in the valleys of the North. Some of the earliest settlers from China came to this area in the early twelfth century.¹ Farmers in this area speak proudly of their traditions, especially their imagination and initiative to work together in self-help projects such as irrigation. This tradition has also had its impact on the land tenure system. Traditionally, the most common way of obtaining land was by clearing and claiming forest land. By 1935, land had become scarce and villagers had to go further from home to find new land to cultivate.² The unavailability of land brought hardship, as one old man said:³

If there is no new land to clear anywhere, things would be hard, but there is usually land. If it's not irrigated, then one clears more of it and trusts to luck. If it produces well, then good. If it produces badly, well, that's that.

Other common means of acquiring land were through inheritance and purchasing. Moerman stresses the point that developed land had a price, a value, which reflected its ability to produce and the fact that secure title was available.⁴

The ability to pursue these alternatives would seem to suggest that the tenancy rate is rather low. The 1963 Agricultural Census reported that 26 percent of the farmers are tenants. In its 1969 report, the National Statistical Office showed only 18 percent of the farmers to be tenants.

¹Wendell Blanchard, Thailand: Its People, Its Society, Its Culture (New Haven, Connecticut: Human Relations Area Files, Inc., 1958), p. 25.

²Moerman, Agricultural Change, p. 92. ³Ibid.

⁴Ibid., pp. 94-99.

Apparently, some farmers have been able to improve their situation through the purchase of land. Thodey and LaRamee's 1974 study of the Ban Pa Mack area revealed that 23 percent of the farm families were tenants and an additional 30 percent were part-owner tenants. The latter group rented approximately 53 percent of the land they operated. Of the land owned, 50 percent was under reserve license and the remaining 50 percent under exploitation testimonial--no owner has acquired fee simple ownership.¹

Though Moerman's study of Ban Ping does not give any statistics on the rate of tenancy, it contains an excellent chapter on land acquisition which reveals some very interesting land tenure arrangements. Home fields are generally owned and the farmer has secure tenure. Some of the land is registered, but most farmers underreport to avoid paying land taxes. Land, which is located outside the village, is accurately registered with officials because correct records are the only guarantee a farmer has to protect his property rights.

Renting does not occur very often, mostly when a landowner does not have enough factors of production, primarily labor, to cultivate all the land he owns. The landlord will first look within his own village for a renter, probably a kinsman, and, if none is available, he will recruit outside the village. A renter will rent because he does not have enough land to subsist on or as a favor to the landowner. In many cases, the tenant will farm land near his inheritance, suggesting fragmentation has occurred and the operator is attempting to consolidate his farm operation. Because of the availability of forested land which can be claimed and an active land market, landless farmers have not been a problem in the Ban Ping area. In summarizing the role of renting in Ban Ping, Moerman

¹Thodey and LaRamee, Ban Pa Mack, p. 14.

describes it as a transient stage which a farmer passes during his career.¹ In this instance, it appears that farmers can move up the agricultural ladder to full ownership unimpeded.

In the valleys, the population pressures are rising and there is no longer a surplus of fertile alluvial soil to expand production. At the same time, commercial agriculture has made big strides in this region. These factors are causing a change in the tenancy and land use situation. In 1963, the average farm size was reported to be approximately 16 rai (6.5 acres).² By 1974, the average farm size was down to 12 rai in Ban Pa Mack, with 40 percent of the farmers operating on less than 10 rai (4 acres).³ In some villages average size of farm is 5 rai (2 acres),⁴ which would be below subsistence level if intensive practices were not followed. Because of expansion into upland areas, water problems have arisen which have seriously threatened the productivity of these small plots.

An increased emphasis on commercial production, particularly during the dry season, has increased the demand for land. Water is needed during this period and irrigation facilities have been expanded. Traditionally, farmers built and maintained their own irrigation structures, but over the last few years the government has provided more and more of these facilities. Commercial agriculture requires new inputs and more services, unavailable within the customary village environment. More

¹Moerman, Agricultural Change, pp. 91-115.

²A. N. Seth, "Report on Land Reforms in Thailand," in National Seminar on Land Problems and Policies in Thailand, FAO (Bangkok: n.p., 1970), p. 11.

³Thodey and LaRamee, Ban Pa Mack, p. 13.

⁴Gehan Wijeyewardene, "A Note on Irrigation and Agriculture in a North Thai Village," Felicitations Volumes of Southeast-Asian Studies, Vol. II (Bangkok: Siam Society, 1965), p. 256.

reliance is put on relationships with outsiders, merchants, and other townsmen who can provide credit. These new relationships are different than the old ones because everything depends on money. This places many farmers, who are unable to save, cannot properly manage their farm, or do not have access to the market when prices are best in a precarious position. The result is either a loss of land to creditors or the inability of tenants to move up the agricultural ladder. Land becomes consolidated in the hands of a few.¹

As the agricultural system becomes more dependent on the government to finance irrigation facilities, there is concern that landed property will move "into the hands of the bureaucracy and of the class which they appear to dominate."² Wijeyewardene attempts to show this shift into the hands of the bureaucracy. Though his analysis can be considered highly conjectural in some aspects, he concludes that ecology and technology are forcing land into the hands of the wealthy. Simply, an increasing population together with an equal sharing of inheritance, land has been divided into very small parcels. To prevent farms from becoming too small and uneconomic, most farmers rely on purchasing land to expand operations. With land supply limited, the price of land has risen rapidly to values beyond which the small cultivator can bid on. The land market becomes accessible only to the wealthy who are either prosperous farmers or non-cultivators.³ A farmer unable to expand has a choice of renting

¹Though there is little evidence to support these statements, some observers at the Northern Region Agricultural Development Center feel that tenancy is closer to 33 percent and that the traditional landowner-tenant relationships are breaking down.

²Gehan Wijeyewardene, "Hydraulic Society in Contemporary Thailand," in Studies of Contemporary Thailand, ed. by Robert Ho and E. C. Chapman (Canberra: Australian National University, 1973), p. 101.

³For a detailed development of this line of reasoning see Wijeyewardene, "Hydraulic Society," pp. 89-110.

or selling and moving to a place where more land is available, usually an upland area.

In recent years, many families have moved into the upland deciduous forest region because land was not available in the valleys or the economic opportunities on small parcels did not materialize. The mountain environment provided economic opportunity in that tea cultivation was a very profitable undertaking, and through hard work and savings a family could move up the social ladder eventually returning to the valleys and purchasing good rice land. Van Roy describes the migrant to the uplands as a recently married, landless couple in their early twenties.¹ At first, they work for an established tea grower but some clear their own land. Many do not actually register their land with the government continuing to follow the ancient practice of squatting. By allowing their tea farms to mature and by paying local taxes, the farmers consider the property to be theirs.²

The government has attempted to restrict movement into the forest lands by enacting laws making burning forest reserves and cultivating the land illegal and a punishable crime, but the Forest Department and Land Department have been very ineffectual in developing and implementing a workable policy toward achieving this objective. Since population pressures are severe in the lowlands, a continued migration into these forests can be expected. The permanent removal of forest cover poses a serious threat to the country's entire agriculture environment. This environment depends on a reliable and controllable water supply. Uncontrolled destruction of the northern watersheds could have a serious impact

¹Van Roy, Economic Systems, p. 106.

²Ibid., p. 187.

by causing soil erosion from rapid run-off in the uplands, flooding in the Central Plain regions, and insufficient water for dry season crops.

Often the blame for much of the denuding of forests is placed, not on those moving up from the valleys, but on the hill tribes who have historically lived in the mountains. These people have never followed the regulations established by the government, instead they practice land use according to their customs. Swidden (to clear by burning) agriculture is best described as a means for man to adapt to natural conditions rather than modifying natural conditions.¹ A man clears only a piece of land temporarily, plants a crop, and soon deserts the area allowing the forest to reclaim the land. If the length of the fallow period is long enough, the environment can be completely rejuvenated. With increasing population caused by migrating hill tribes people from neighboring countries and higher birth rates and lower mortality rates among the indigenous population, changes have occurred in the swidden practices which seriously threaten the natural environment.

Government policies have also restricted the movement of the hill tribes people forcing them to cultivate fields longer than is allowable and still insure a viable environment. The production of poppy has been curtailed by the government and new crops have been introduced which require different agricultural practices often incomprehensible to the hill tribe farmer. The result of these programs is usually forest destruction and soil loss, since no provisions have been made to counteract these forces. The Hill Tribes Division of the Public Welfare Department has improved its programs and has produced limited successes with some of the newer strategies.

¹F. G. B. Keen, Upland Tenure and Land Use in North Thailand, SEATO Culture Programme (Bangkok: Siam Communications, Ltd., 1972), p. 9.

Each tribe has its own tenure arrangements which vary according to the type and amount of land available for cultivation. In general the essential features are stability and inherited usehold rights¹ which are guaranteed by the village headman. Families retain their rights to each swidden used in rotation until the land is finally abandoned. These land tenure systems are a result of cultural attitudes towards land as a resource.²

Conflicts arise when the hill tribes return to land left fallow and find lowland farmers occupying the land. Then, the two concepts of land ownership, continuous occupancy versus rotation occupancy, are at odds with each other. For the time being, Keen has praised the hill tribes for not resorting to violence to reclaim their land.³ But as competition for land increases with the different customs of possession, violence may be unavoidable.

Swidden agriculture adapts to the environment only if the population is low and density is relatively stable. This condition no longer pertains to the upland regions. With increased population pressures, the agricultural system as an economic enterprise is no longer compatible with the environment. The end result is a natural system which cannot produce and probably cannot be restored to its original state.

The Northern region is faced with a serious problem of too many people competing for a limited amount of land resulting in an increase in tenancy causing serious economic and social inequities.

¹Ibid., p. 32.

²Ibid., p. 34

³Ibid.

Central Plains. The heart of the Central Plains is the area of lowland drained by the Chao Phraya river and other rivers which form the delta at the head of the Bight of Bangkok.¹ In a north-south direction, the Central Plains is composed of the delta and piedmont region of lowlands and rolling foothills. On the east, the Plain is bordered by the Petchabun Mountains; on the west by the Western Highlands and in the north by the North Range. The most important physical characteristic is the extensive river system which deposits soil on the floodplains and provides water for a very productive agricultural environment.

The climate follows a dry and wet season pattern with enough rainfall between May and October to support productive wet rice agriculture. A large portion of the delta region is covered by alluvial soils which are moderately to highly fertile. Until water control programs were undertaken in the mid-1850's, the yearly floods brought new soil deposits rich in nutrients. Over the last 150 years, many of these soils have been depleted and the land has become less productive unless fertilizers have been applied. In the areas surrounding the delta, soil fertility varies but, in general, most of the soil is low in fertility. Most of these soils are old and tend to be acidic; both factors tend to restrict the production of agricultural crops.

Tenancy in the Central Plains increased from 23 percent in 1963 (Appendix A-3) to 41 percent in 1969 (Appendix A-4). Dramatic though this trend was, it should not be overemphasized. Besides the errors in data aggregation previously referred to, tenancy in the Central Plains has been influenced by three interrelated factors: canal development,

¹Sternstein, Thailand, p. 12.

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patronage, and commercial agriculture. Each of these factors must be briefly examined so that the tenancy picture comes into sharper focus.

The history of canal development is very colorful¹ and is very similar to the development of the railroads in the U.S. though not quite as successful. During the early 1800's a few canals were built using peasant labor to facilitate communication and troop movements to the outlying provinces. There was no impelling need to settle the land. After the Bowring treaty there was a rapid expansion onto unclutivated land in order to take advantage of the commercial rice trade which was becoming very important. Much of the land surrounding Bangkok was swampy and canals were built to control the water and open the land for cultivation.

Beginning in the early 1880's, the government decided to allow private companies to construct a network of canals on the east bank of the Chao Phraya to the northeast of Bangkok in what is commonly referred to as the Rangsit area. In order to raise capital for the venture, the canal company was granted large tracts of land which it in turn sold to wealthy Bangkok residents or local farmers. Much of this land was leased to peasants. Canal construction was later expanded to the west bank of the Chao Phraya and north of Bangkok. These projects were never completed for financial reasons or poor engineering. Still, many urban residents, urged on by the returns from commercial rice activities, purchased more

¹Some excellent historical works have been done on this topic, including: Ingram, Economic Change in Thailand, pp. 79-87; David Johnson, Rural Society and the Rice Economy, 1880-1930 (unpublished Ph.D. dissertation, Yale University, 1975); Shigehave Tanabe, "Historical Geography of the Canal System in the Chao Phraya River Delta," Journal of the Siam Society, LXI, Part 2 (1977); Takashi Tomosugi, "The Land System in Central Thailand," The Developing Economies, VII, No. 3 (1969); and Leslie E. Small, "Historical Development of the Greater Chao Phraya Water Control Project: An Economic Perspective," Journal of the Siam Society, LXI, Part 1 (1973).

land throughout the delta region. By 1930, unclaimed land was no longer available in the southern portion of the delta region.

Another factor contributing to the concentration of land ownership was the patronage system established by the king to reward faithful government servants and members of the royal family. Upon retirement from government service, a bureaucrat received no type of social security or pension. To compensate for this, the king granted tracts of land to these people, the size depending on the status of each individual. A person could select a small parcel in Bangkok or a larger tract (over 500 rai) in rural areas. Most of the area claimed was in productive agricultural areas so that the owner could lease the land for a percentage of the rice crop and participate in the commercial rice trade. Tanabe describes how this practice was carried out during the reign of King Mongkut (1850's) and how a landlord-system was established.¹ The practice was finally ended when the monarchy was overthrown in 1932.

Much of the land obtained from the canal companies or through grants from the king is still in the hands of the original families who received title to them. An underlying motivation to retain these lands has been the financial returns from commercial agriculture. The two actions, referred to above, may be blamed for establishing a tenure system based on private ownership and exploitation of peasant labor, but it was commercial agriculture which has perpetuated the system. Many farmers were unprepared for the commercial economy especially the use of credit. Because land prices were rising, many farmers had to take out loans to purchase farm land. One bad cropping season could mean the loss of one's farm. During the depression, many farmers were forced to become tenants.

¹Tanabe, "Historical Geography," pp. 57-61.

Zimmerman's data for 1930 for the provinces in the heart of the delta surrounding Bangkok has shown tenancy rates as high as 98 percent.¹

After World War II, new land in the peidmont was opened and many tenants moved onto the unclaimed land in an attempt to own land. On the other hand, there were forces which were working against farmers. The dam and canal development of the upper Chao Phraya was pushed ahead in order to expand commercial agriculture. New consumer products were introduced which altered farm household expenditure patterns.² At the same time, the government held down the domestic price of rice by placing a rice premium or tax (see Chapter V) on all exported rice. This reduced farm incomes which eventually could not keep pace with the price of consumer goods and farm inputs. The distortion between returns and costs finally drove many farmers into debt, and, some farmers content, into tenancy.

Because the 1963 Agricultural Census could not provide an accurate picture of the land tenure situation, the Land Policy Division undertook a survey of five central provinces: Pathum Thani, Ayutthaya, Nakhon Nayok, Lop Buri, and Nakhon Sawan in 1964. The data was aggregated for all five provinces and, as a result, findings are questionable, because they do not describe each individual province. The results indicated that 41 percent of the farmers were owners, 56 percent were tenants, and 3 percent unclassified. The tenant group was broken down into pure tenants, 29 percent, and owner-tenants, 27 percent.³

¹Zimmerman, Siam, p. 28.

²Tomosugi, "The Land System," p. 293.

³Land Policy Division, Relationship Between Land Tenure and Rice Production in Five Central Provinces, Thailand, 1964 (Bangkok: Land Development Department, Ministry of National Development, 1965), pp. 1-2.

In 1967, the Land Policy Division conducted a much more detailed study of 26 provinces in the Central Plains and this time the data was not aggregated above the provincial level. The data was collected through interviews with village headmen of rice growing areas. The survey did not include farmers who were not registered at the district registration office.¹

A portion of the results have been presented in Appendix A-6. What stands out is the high percentage of tenancy in the provinces surrounding and including Bangkok (Phra Nakhon and Than Buri), ranging from 28 percent in Nontha Buri to a high of 61 percent in Pathum Thani (Rangsit area). As one proceeds farther from Bangkok the tenancy rates drop significantly (Map 2). Overall tenants comprise 23 percent of farm families and cultivate 22 percent of the area planted. Owner-tenants comprise only 16 percent of the farm families and 12 percent of the area they operate is rented. The provinces with high tenancy rates also have the highest percentage of title deeds, as pointed out in the previous section.

Adul's research report found comparable statistics though for Pathum Thani his figures are much higher with tenancy at above 79 percent. For the Central Plains, he reported a tenancy rate of 25 percent. Senarak, in the literature review for his thesis, presented data collected by Udhis Naksawadi on land tenancy in the Central Plains. Naksawadi's first study was in 1957 where he found the percentage of owners, owner-tenants and tenants to be 47, 28, and 25 percent, respectively. Repeating the survey in 1967, the results showed 40 percent of farmers to be owners, 34 percent owner-tenants, and 25 percent tenants. The changes in the first two

¹Land Policy Division, Land Tenure Situation in Twenty-Six Changwats of Central Plain Region, 1967-68 (Bangkok: Land Development Department, Ministry of National Development, 1968), p. vii.

categories are attributed to increases in the cost of living and inheritance practices, both requiring the operator to rent more land.¹

Brian Foster also observed similar patterns in some villages near Bangkok. Land pressure from increasing population and fragmentation of holdings and political and economic conditions which demanded cash for subsistence has greatly altered village life. Some farmers have become tenants because their holdings were too small and uneconomical. The only way to expand farm size was to rent, because land values were too high to allow them to purchase land. In the village of Bang Tanai, 65 percent of the families did not own any land; 27 percent of these families considered their primary occupation to be rice farmers.²

One of the major goals in the Third National Economic and Social Development Plan (1972-1976) was the improvement of farmer's income through rural development programs. To do this, several strategies involving land tenure improvement were suggested. More information was needed on the land tenure situation, and the Land Policy Division was asked to survey each province, collecting basic data on land tenure. The project was terminated in 1978 with 22 provinces completed, most of them located in the Central Plains. The survey was very similar to the 1967 survey though the major focus was on landlords and included all types of agricultural production units. Village headmen were asked to supply the data and in most provinces better than 90 percent replied. Since no final report has been prepared, the author has pulled together all the individual reports and presented the data in Appendix A-7.

¹Senarak, "Land Alienation," pp. 25-26.

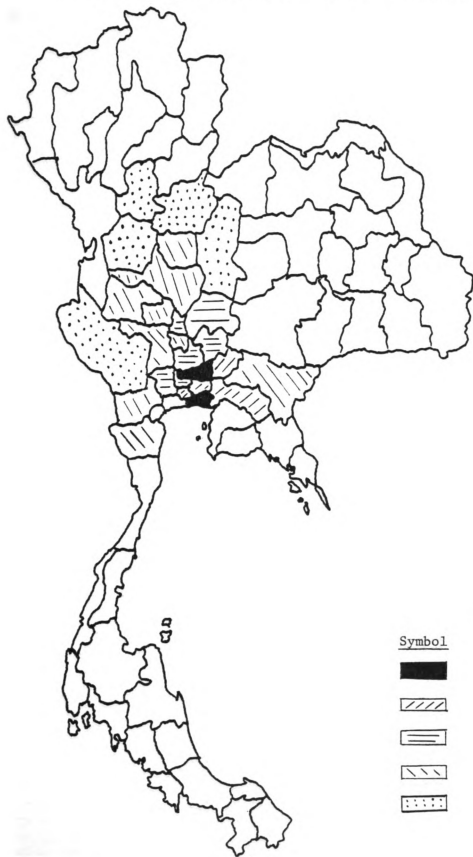
²Brian Foster, "Adaptation to Changing Economic Conditions in Four Thai Villages," in Cultural-Ecological Perspectives on Southeast Asia ed. by William Wood Paperson, International Studies Southeast Asian Series No. 41 (Athens; Ohio University Center for International Studies, 1977), p. 115.

Clearly, those provinces with high tenancy rates are located near Bangkok (Map 3). No accurate comparison with the 1967 survey can be made because the surveys were conducted in slightly different manners and the data were interpreted differently. In most cases, the two data sources reflect the same situation, especially in the owner category. In this case, a significant change in percentage, such as in Ang Thong, may indicate an emerging area where a land tenure problem exists, but no definite statements can be made. One important classification made in the 1978 study was the reference to "landless" or those who do not own any land at all. Many of these "landless" people considered their previous occupation to be farmers; some having owned land while others were farm laborers. Even though the reports contain no specific data on the reasons for loss of land, it suggests that possibly some land alienation is taking place.

Land alienation or the loss of land to creditors is one of the farmers' chief complaints to the government. Only a few inconclusive studies have been made to clarify the circumstances surrounding this situation. In a detailed study of one community registering a high number of complaints, Senarak found that farmers could not adjust their expenditure patterns to accommodate periodic crop failures. As a result, they lost their land to creditors.¹ But many farmers in other areas feel that they lost their land through fraud. Reports from Phitsanulok province suggest farmers lost their land to some unscrupulous businessmen who had obtained information on a new irrigation project prior to the plans being revealed publicly. In touring this area, the author met people willing to talk about the fraud, but all the evidence was highly

¹Senarak, "Land Alienation," pp. 121-29.

Map 2
Tenancy Rates of Rice Farmers in Central Plains, 1967



KEY

SymbolTenancy Rate

60 - 100%

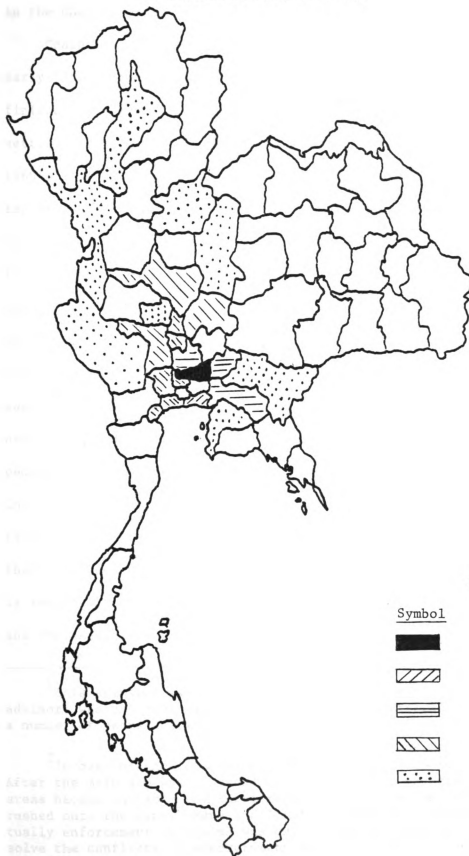
40 - 59%

20 - 39%

10 - 19%

1 - 9%

Map 3
 Tenancy Rates of all Agricultural Units in
 Central Plains, 1974-1977



KEY

SymbolTenancy Rates

60 - 100%



40 - 59%



20 - 39%



10 - 19%



1 - 9%

conjectural. Most often the situation is similar to the problem faced in the Chainat area.

Chainat is located in the upper Chao Phraya River valley. In the early 1950's, the Chainat diversion dam and major diversion canals were finished. This allowed new lands to be opened and people rushed to settle the area, usually under the practice of Chap Chong. In the late 1960's, the Dutch government was asked to assist in preparing plans and implementing an on-farm irrigation program. These consolidation projects had to take place in areas with no land disputes. Few suspected that there would be any land problems in this area, but it was not long before land ownership conflicts arose. The common scenario was that those people who had been farming the land for two decades following the customary practices believed they owned the land. Actually, legal title was held by wealthy people in Bangkok, many who had never been to the area and could not locate their property. Title was conveyed to these people by high government officials shortly after the dam was built. The land only became of interest to the "legal" owners when the on-farm irrigation projects increased the value of the land.¹ So far there has been no attempt to resolve this conflict. This same scenario is reportedly repeating itself in other irrigation areas, such as Phechit and Phitsanulok.²

¹This scenario was related to me by Hans Grutzmacher, an ILACO advisor, who has been assisting in the on-farm irrigation project for a number of years and was quite knowledgeable of the problems in the area.

²In one instance, the government did stop in to settle land claims. After the main dam was finished on the Nan River in Uttaradit, certain areas became suitable for settlement around Toong San, Phitsanulok. People rushed onto the land. Many conflicting claims were established. Eventually enforcement of claims was carried out by gangs with guns. To resolve the conflicts, the government set up a land settlement project to plan, organize, and guide proper land settlement and guarantee each farmer his property rights. It was not an easy task, but by 1977 the situation had diffused and settlement was proceeding according to government guidelines.

Some agricultural observers after reviewing the statistics presented above have called for significant adjustments in land tenure institutions to improve productivity and rural welfare. Indeed, there are areas with seriously distorted land tenure patterns, but these patterns have historical roots, they are not a recent phenomena. The data does not indicate that tenancy is rising throughout the country. Laurence Stifel is one person who believes that rural conditions are not gravely deteriorating. In a study of selected villages in Ayutthaya and Nakhon Pathon provinces, Stifel examines a sample of title deeds to find what types of changes have occurred in ownership patterns. His analysis shows: 1) that except for the depression years and immediately after World War II, land was transferred principally through sale, inheritance, or gift, not involuntarily through indebtedness; 2) that land is not becoming concentrated in the hands of a few individuals, thus widening the inequality gap between the wealthy and poor; 3) that land lost from mortgages and indebtedness (where land had been used as a collateral for a loan) is decreasing; and 4) that landlords are not in a monopolistic position to exploit tenants. His results diverge from what is generally accepted to be true. He attributes this divergence to alternative economic opportunities in urban areas and the mobility of peasants who can take up residence on unclaimed land in other regions of the country.¹

Stifel's study provides a different way of looking at the issues surrounding land ownership. Some of the points he makes are valid, e.g., the loss of land through indebtedness. In other respects he is myopic. The lack of urban opportunities and a closed land frontier have reduced

¹Laurence D. Stifel, "Patterns of Land Ownership in Central Thailand During the Twentieth Century," Journal of the Siam Society, LXIV, Part 1 (1976), pp. 237-74.

the alternatives open to many rural families. Also, many people with surplus capital are investing in land because of rising food prices during 1974 and 1975 and the withdrawal of the U.S. military presence in Thailand¹. Finally, his analysis does not pursue several important points, e.g., who is actually farming the land (the title deed does not reveal this)? Or are farms becoming smaller through land fragmentation? These two points may discourage a farmer from raising productivity on the land he operates. Regardless of this analysis' shortcomings, other students of Thailand's land tenure institutions should be aware of this work which could assist them in their own evaluations.

Landlord-Tenant Relationships: Socio-Economic Characteristics of Land Tenure

Tenancy rates represent only part of the land tenure picture. Tenancy rates may be high in an area, but a benevolent landlord-tenant relationship may actually encourage tenants to increase productivity improving their economic and social well-being. On the other hand, landlords can exploit tenants by demanding a higher rent than what is equitable and providing no long term security in the leases held by tenants. Little data exists on the nature of landlord-tenant relationships and the status of tenant farmers. What information has been collected pertains specifically to the Central Plains region. From individual research reports a representative picture of the status of the tenant farms can be formulated.

In the Northeast, most of the land is rented from kinsmen or local villagers. These people do not usually charge a very high rate for the

¹It is very difficult to follow land market activities in Thailand, the recent flurry of land transaction was described to me by Chusak Himathongkom, Vice-President, Bangkok Bank.

land. In Saraphi, Janlekha found that the rental rate was 20-30 Baht per rai or, if payment was in kind, 10 percent of the crop was given for rent. Some 50-50 sharing existed with the owners providing food and the necessary agricultural inputs.¹ Leases are generally for one year and could be renewed.

Even though the tenancy rate in the North is high, one seldom hears of conflicts between tenants and landlords. Farmers in this area take pride in their agricultural tradition; a friendly and cooperative landlord-tenant relationship is a cornerstone supporting this tradition. Moerman's study of the close knit village of Ban Ping has shown that a landowner will generally attempt to rent to a kinsman first and, only as a last resort, to an outsider. The owner provides all the seed and the animals for plowing the fields. For this, he receives 50 percent of the crop. If the tenant supplies his own animals, he is required to pay 1/3 the crop as rent.² Higher rental rates are usually charged to outsiders, but if labor is in short supply, rental rates are fairly uniform. Rental contracts are usually given for one year.

In Ban Pa Mack, households renting from parents did not pay any rent, while the other renters shared from 30 to 50 percent of their rice crop with the landlord. In the dry season, those tenants who grew rice shared the crop 50-50 with the landlord. For other crops the tenant paid 10-30 Baht per rai as a rental fee.³

Tenure arrangements in Wijeyewardene's study area are based on the personal relationships of the tenant and the landlord. Generally, the

¹Janlekha, "Saraphi," p. 30-34.

²Moerman, Agricultural Change, p. 100.

³Thodey and LaRamee, Ban Pa Mack, p. 14.

wet season crop is split 50-50, after the party supplying the water buffalo (used for plowing) is given a predetermined share. The landlord pays all land taxes and any costs for constructing and maintaining the irrigation systems.¹ In some cases, tenants are required to work on the irrigation system. During the dry season many tenants are allowed to sow crops rent free; others pay rent.² Tenants usually do not have security in their leases, which can be terminated at any time.

Supope Guntamala of the Northern Region Agricultural Development Center, who also is a landlord, elaborated on the traditional tenure arrangements of the Northern region in a private discussion. Most landlords are concerned with receiving rent from the wet rice crop because of its traditional commercial value. Landlords then allow tenants to pursue any additional activities on the land during the dry season. In some cases, tenants will plant additional crops; others will rent out the land to other tenants--a very interesting case of subinfeudation. Landlords often provide a portion or all of the necessary inputs for wet rice farming and may even pass on information of new dry season innovations.

Both Guntamala and Wijeyewardene are concerned about the future of these rather benevolent relationships. First, more outsiders are buying up land in the region--people who have not been reared in the traditions of the region. Second, the dry season crops, e.g., garlic and soybeans, are becoming very valuable commodities and many landlords now want to capture some of the returns from these crops. These observers of Northern Thai agriculture sense a drift to a more exploitative position by the landlords and a deterioration of the traditional attitudes toward agriculture. The

¹Gijeyewardene, "Irrigation and Agriculture," p. 257.

²Gijeyewardene, "Hydraulic Society," p. 105.

landlords hold an advantage since a surplus of labor in the region reduces the bargaining power of the tenants. Clearly, agriculture has become a highly commercial enterprise in this region.

A number of studies have been done on the status of tenants in the Central Plains. In 1964 the Land Policy Division reported that 51 percent of the tenants and 53 percent of the owner-tenants had no written contract--most commitments were verbal and of one year duration. Only those farmers renting from relatives could receive long term commitments to till the land. Rental payments in cash ranged from 52-57 Baht per rai, while payments in kind were generally a 50-50 split. Converting kind into cash, rents were estimated to be between 89-102 Baht per rai. With 77 percent of the agreements the tenant was obligated to pay the required rent even if the tenant had an unsuccessful season.¹

This study also reported that tenants operated on smaller holdings than owners or owner-tenants. Many of the farmers were in debt, their consumption (household and agricultural) expenditures exceeded their income. This would indicate that farmers were not capturing any of the returns usually captured by labor and management, as factors in production. Most of the returns were divided between capital and land rent. One disturbing point was the fact that 81 percent of the tenants had never owned any land and no tenant had been able to become a landlord.

In his review of the Land Policy Division's 1965 survey of land tenure and agricultural production, Takahashi concluded that social mobility in the Central Plains appeared to be heading downward ² because

¹Land Policy Division, Relationships, 1964, pp. 2-3.

²Akira Takahashi, "Thailand: Growing Land Problems," in Land Reform in Asia, ed. by Z. Ahmad, World Employment Programme Research (Geneva: ILO, 1976), p. 84.

87 percent of the tenants surveyed had never owned land (13 percent having lost land through indebtedness) and no tenant was able to move up the agricultural ladder becoming a full owner.

The survey¹ also reported that approximately three-fourths of the rental contracts were oral agreements with no provisions for secure tenure. Most of the rents were fixed either in kind or cash. In kind payments were usually the most common (60 percent of the agreements) averaging 90 kilograms per rai. Share rent was used only between relatives and varied between 1/3 and 50-50 split. Average payment in cash was 70 Baht per rai though rents of a 100 Baht per rai were common. In some cases, landlords were requiring tenants to pay their rents in advance.² This has caused some conflicts between tenants because some one wanting more land will prepay for land cultivated by another tenant. Thus, the original tenant has no land to till.³ Under these conditions, many tenants must take out loans to prepay their rent. This perpetuates the chronic cycle of indebtedness faced by the majority of tenants.

Chuchart and Chirapanda resurveyed these eleven provinces in 1971 to see if there were any significant changes in the land tenure and production patterns of the farmers. They found that the educational level had improved through government efforts to improve the literacy of older farmers. Farm holdings decreased slightly from 46 to 42 rai. The most significant change was in number of large farms. In 1965, 56 percent were over 60 rai but in 1971 only 21 percent were that large. These

¹Chiayong Chuchart, Relation of Land Tenure and Production of Farmers in Eleven Provinces in the Central Plains, 1965 (Bangkok: Land Development Department, 1969).

²Takahashi, "Thailand," p. 84.

³Tomosugi, "Land System," p. 306.

changes were attributed to population pressures. The size of holding by tenancy did not change except for owner-tenants whose average size decreased from 53 to 43 rai. Overall, the percentage distribution of farm size is clearly towards smaller farms. Tenancy rates and contract arrangements did not vary over the time period. Rental rates did increase significantly to about 88 Baht per rai. One of the more interesting findings was that indebtedness had increased and interest rates were high, above 20 percent, but the major sources of loans had switched from the private moneylenders to the banks and cooperatives.¹

Even though there is no mention of subinfeudation in formal reports, evidence of it existing was found in talks with local people. An example of one case on Crown land in the Ban Na study area is given in Chapter VI.² Subinfeudation seems to occur on private lands, as in the Northern region. How widespread subinfeudation is on private lands has not been documented, but is expected to exist extensively in areas where landholdings are large, such as the Rangsit area. More research needs to be done on this topic before factual statements can be made.

Landlord-tenant relationships vary throughout the country and even within regions. It appears that most farmers in the North and Northeast are on good terms with their landlords. In the North especially, there is a great deal of cooperation so both parties benefit from improvements in the agriculture system. The higher rental rates and lack of secure

¹Chiayong Chuchart and Suthiporn Chirapanda, Changes in Agrarian Structure in Central Thailand, 1965-1971 (Bangkok: Department of Land Development, 1974).

²Dr. Ammar Siamwalla told this author that subinfeudation in urban areas was even more outrageous. For example, Siam Square, which is Crown property, and probably the most valuable in Bangkok, is leased to the original renter for 100-200 Baht a month. Actual occupants pay approximately 5000-6000 Baht a month.

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rental contracts in the Central Plains indicates that the farmers of this region are exploited and have few opportunities within the agricultural sector to improve themselves. Probably, their biggest problem is chronic indebtedness due to the increased cost of agricultural inputs, especially new technologies, and to changes in consumption patterns stimulated by a wide array of goods previously unavailable to them, e.g., radios, televisions, and motorcycles. The problems between landlord and tenant are known by the government, but little has been done to improve the situation.

Summary

Even with all these data, it is very difficult to draw any definite conclusions about land tenure in Thailand. Evidence does not conclusively support the contention that tenancy is rising. Most high tenancy areas, e.g., Rangsit, have an historical economic reason for those high rates. Trends are difficult to establish because of the data problem. Simply saying that in 1963 tenancy was at 23 percent and in 1969 at 41 percent for the Central Plains is meaningless, because the data was aggregated differently. The important question, "is tenancy rising?", is unanswerable using existing data sources. Pressure on land resources by a rapidly growing population would suggest that tenancy may become a problem.

Another point is land mobility or the ability of a young farmer to move up the agricultural ladder from unpaid family labor to owner operator. Early evidence in the Land Policy Division surveys contend that tenant farmers are locked in. Many other reports, e.g., Stifel and Moerman, suggest that the land market is very active and farmers do move up to owner-operators. In areas where land resources are no longer available for settlement, a person may have to rent for a longer period

than if land was still available. As commercial activities push the value of land up, it is possible that many farmers will be unable to buy land. Little evidence is available on land activities, because of defects in the land market, in particular, a lack of information, the method in transferring title, divisibility of product, and the imperfect specification of ownership rights.

Not much evidence exists on landlord-tenant relationships--one of the most important aspects of any land tenure system. From available information, relationships vary throughout the country. In the high tenancy areas, where absentee landlords (those living outside the district in which the land rented is located) are most prevalent, tenants are highly exploited and the government would be justified in interfering in these relationships in behalf of the tenant. Since these relationships are already very productive, any interference in the relationships found in the North could possibly be counterproductive.

Thailand is apparently at a crossroads: either it can improve the tenancy situation or do nothing in which case tenancy will probably rise. The forces of increasing population numbers, limited land supply, and an aggressive commercial agricultural sector are already present and can push tenancy higher. Pressure for change has grown especially since the early 1970's. Economic instability since 1972, a result of fluctuations in the world economy and the October 1973 Revolution, have both contributed to complaints from farmers about tenancy conditions and the economic situation in rural areas especially the price of rice. Unlike urban demonstrations, farmer unrest usually does not disturb Bangkok bureaucrats and politicians. But with the communist takeover of neighboring countries and the prospect that farmer

groups could come to Bangkok and take to the streets in protest, rural stability has become an important issue.

As a result, a Rent Control Act, a Land Consolidation Act, and a Land Reform Act were passed in quick succession in 1974 and 1975.¹ Though this study is concerned basically with land reform, the other two acts are closely related to land reform in that they provide some of the economic guidelines for agricultural development projects.

Thailand's New Legislation

Land Rent Control Act

The first law to control the level of rent and protect tenants was passed in 1950. A fair rental rate was established according to the productivity of the land. If the yield was over 40 tang² per rai, rent could not exceed 10 tang per rai; for yields between 30-40 tang, rent could not exceed 6 tang per rai; for yields between 20-30 tang, rent was not to exceed 3 tang per rai; and for yields under 20 tang the limit was 1 tang. The act also provided for reductions in rent if crops failed: 1) payment could only be made after harvest, 2) minimum lease contracts of five years, 3) tenant rights were inheritable but not transferable, and 4) eviction of tenants was forbidden.³ Apparently no one followed these regulations, since the information provided in the previous section diverges greatly from the law. The laws were ineffectual because they could not be enforced. Rental arrangements proceeded to be based on customs, rather than by law.

¹For more details on events leading up to the enactment of the Land Reform Act see Lin and Esposito, "Agrarian Reform" and Takahashi, "Thailand."

²1 tang = 10 kilograms = 22 pounds

³Takahashi, "Thailand," p. 82.

The 1974 Rent Control Act again established maximum rental rates and provided for security of tenure. A maximum rental rate set at not more than one-third of the total yield was the main provision in the act. Other provisions included long term rental contracts (six years minimum) to guarantee tenant security and once yearly rental collections.¹ These provisions satisfied most of the immediate demands of the tenant farmers and strengthened their position relative to the landlords--at least on paper. The Rent Control Act set the groundwork for the land reform program to be initiated later.

Land Consolidation Act

Nowhere in any official government policy statement, including the Land Reform Act, is there any discussion of the obligation or responsibilities of the beneficiaries in an agricultural project area. Though the government is responsible for providing or improving production resources, specifically land and water, insuring factor input availability, assisting production improvement through extension, and opening marketing channels via cooperatives or other government facilities, mention of the economic responsibilities of the participants is noticeably absent. Legal precedent for establishing recipient responsibilities is found in Section 46 and 47 of the Agricultural Land Consolidation Act of 1974.² These

¹Kengchen, Land Reform, p. 3.

²The term land consolidation usually refers to the reorganization of fragmented farm holdings into one contiguous farm unit. In Thailand it means something different. According to the Dutch consulting firm, ILACO, which is helping with land consolidation in the upper Chao Phraya region, land consolidation is an "integrated, technical method of land development at interfarm and at farm level, with the emphasis on water control." Land consolidation activities includes construction of on-farm irrigation facilities and farm roads. Some land holdings are rearranged to accommodate the irrigation and road systems, but essentially farm holdings are not changed. See ILACO, Land Consolidation Project in the Central Plain of Thailand, Vol. I (2 vols.; The Hague: NEDECO, 1973), pp. 1-2.

sections apply only in areas where irrigation and drainage systems and related facilities will be constructed. There are no legal statutes concerning a beneficiary's responsibility in other types of agricultural development projects.

The ALRO will use these sections of the consolidation bill to collect expenses for construction of the irrigation system, which includes land clearing, roads, public utilities, and drainage system costs (Section 46) and to charge for operation and maintenance costs (Section 47).¹ These sections will be looked at closely in Chapter IV in the determination of project costs.

The importance of the Land Consolidation Act cannot be understated. Though a legal mechanism now exists whereby officials can collect from beneficiaries for public investments, there is no historical precedent in Thailand for this type of action. Historically, the beneficiaries of irrigation projects have not paid any recovery costs at all. In fact, farmers have generally avoided payments either through providing labor or cash payments for operations and maintenance costs. Many farmers feel that anything provided by the government is a gift and is, therefore, free.

The government is largely responsible for this attitude. The author has yet to find an agricultural project where the administering agency required recipients to pay anything other than production costs, usually repayment of a short-term loan, and membership fees to the cooperative. A notable example is the Hupkapong Cooperative Project, which serves as a model for proposed land reform projects.²

¹Agricultural Land Consolidation Act B.E. 2517.

²Kengchen, Land Reform in Thailand, p. 14.

In this project, water for sprinkler irrigation is provided through pipes not open canals. Project officials control the water flow and distribution. Yet, at no time has any action been taken to have the recipients pay for the much needed water resource. This is perplexing as the construction expenses were very high and the accounting process could have been closely controlled by the government.

Another problem centers around administrative procedures. No guidelines or mechanisms have been set up on how to collect fees or charges. In fact, it is unclear as to just how much the beneficiaries are to pay, and at what rate. These problems probably occur because government officials have found it impossible to force the Thai people to do anything. Officials are reluctant to use coercion and must employ more subtle means to achieve their objectives.¹ No subtle method has been developed to collect charges, thus nothing has been done administratively in the field. Though a number of projects have already come under the act, it is still unclear what will happen.

Land Reform Act

There are many types of land reforms. On a continuum reforms run from mild regulations to complete appropriation of all lands by the state. The regulatory approach accepts tenancies as inevitable and attempts

¹This fact was brought out in a discussion with one government official who was describing some of the ways his office got farmers to respond without using direct force. In other discussions with officials and academicians, the reactions to questions about cost-recovery indicated that most felt the law ineffective and that charges would never be collected. Probably, the major reason the cost-recovery was included in this bill was the requirement by the World Bank that all requests for irrigation loans had to have a detailed cost-recovery study completed prior to approval of the loan. Even without this incentive, the Pareto condition that all the people do not benefit from the project would lend credence to the fact that beneficiaries could be logically charged for public investments made in their behalf. Yet, Thai history and customs do not support this contention.

through regulation to minimize the more exploitative features of the system. The abolition approach completely abolishes tenancy because it is a barrier to economic, agricultural, and social progress.¹ This approach can take many forms from appropriation from landlords and redistribution to farmers with rights in fee simple to complete state ownership of all land resources with the tillers essentially working for the state. Land reforms can also do more than change tenure arrangements. Land uses can be modified and agricultural support institutions, e.g., credit facilities, can be organized or restructured. Thailand's land reform program falls in the middle of this continuum.

Actually the 1975 Land Reform Act was not the country's first attempt at enacting land reform legislation. In 1954, the Social Justice Land Reform Act was passed² with the provision to allocate land to those individuals who had lost their rights to the land they operated either through fraud or termination of a rental contract by the owner. This act had little impact especially in the Central Plains where the legislation was directed because it was unenforceable. Several other attempts were made in the 1960's to enact some type of land reforms to expand agricultural production.³ None of these attempts were fruitful. It was not until 1975 that the forces were there to enact an implementable land reform law.

According to the 1975 act, agricultural land reform means:⁴

. . . improvement made in connection with rights and holdings in land for agriculture, including housing arrangement in such land for agriculture, in terms of the government allocating

¹A. N. Seth, Land Reform in South East Asia, mimeo (Bangkok: FAO, 1970), p. 11.

²Takahashi, "Thailand," p. 82. ³Ibid.

⁴Agricultural Land Reform Office, Agricultural Land Reform Act, B.E. 2518, Bulletin No. 1 (Bangkok: Ministry of Agriculture and Cooperatives, 2519), Section 4, translation.

the state-owned land or land purchased or expropriated by the government from a landowner who does not make use of such land by himself or owns land in excess of his right in accord with this Act, for hire-purchase, rent or cultivation by farmers, who do not own land or own too little land to produce adequate income to meet the cost of living, and farmer institutions.

Unlike the land reform legislation in Japan, Taiwan, and Iran which affected almost every parcel of agricultural land, Thailand's program is very specific and narrow in scope.

A land reform area, as declared by Royal Decree, fits a criteria, established in Chapter III, Section 25 of the Act. To be designated a land reform area, an area should have one or more of the following characteristics:¹

. . . where a large portion of farmers do not own land or own little land which is insufficient to make a living or have to rent lands of other people for cultivation as well as where the yield per rai is low shall be taken into consideration as criteria for the selection of priorities.

In this section, a specific audience has been identified consisting of the landless, tenants, and small subsistence farmers. To satisfy the needs of this group, land reform includes more activities than merely improving the rights in land. The law states that the government must provide assistance in developing agricultural occupations, providing production resources and inputs, and improving production and marketing facilities.² The program must also solve an increasing land fragmentation problem, especially in the Northeast, provide agricultural programs in marginal production areas which border the more productive rice areas of the Central Plains, and open new land or introduce alternative occupations in areas such as the North where farms are becoming small due to population pressure.

Land used for reform purposes can come from three sources: the Crown, public domain, and privately owned lands. The king has sold land throughout

¹Ibid., Section 25. ²Ibid., Section 4.

the country to the ALRO with the funds going into an account to be used for farmer credit. Public land can be used if it has not been reserved for a national purpose, such as a forest reserve.¹ Private land can either be purchased or expropriated under the real estate laws.

One important section of the bill deals with farm size limitations and acceptable exceptions to the mandated guidelines. One family cannot own more than 50 rai except for a family engaged in livestock production where a 100 rai limit is allowed. Exceptions to this rule allow families to retain large tracts of land. Owners who have cultivated their land for at least one year prior to the land being declared a reform area can apply for recognition of their property rights up to 1,000 rai limit. This limit is much higher than the legally prescribed limit of 50 rai for cultivation and 100 rai for livestock raising per family.

Further exceptions are given for areas over 1,000 rai, if farmers have invested heavily in their land with government support. Fruit orchards and mulberry farms for silvaculture are two types of accepted investment. Additional exemptions may also be approved when farmers are engaged in activities which employ modern farming technology and which produce crops in high domestic and foreign demand. Lastly, a farm enterprise which promotes "agricultural production and industry in a wide scope" thus aiding in agricultural development, providing assistance to other farmers, and serving as a marketing outlet for farm products, can be privately owned.²

¹Which public lands can or cannot be used are delineated in Section 26 of the Act. Public land designated for public use, regardless of its current use, can be declared a land reform area; should a land reform area contain a parcel of land set aside for special government use, the land can be reformed without seeking revocation by the Land Department; and any other land, deserted or reverted to the government, except for forest reserves, can be reformed.

²Ibid., Section 29.

The Land Reform Act actually is attacking only one segment of the rural ownership pattern--the absentee landlord. Even in this case the absentee landlord can retain 20 rai of his holding for his own use. If an absentee landlord should decide to cultivate his own land and can prove he is capable of farming the land, he may be allowed to retain his property rights limited to the acreage prescribed by law.¹

Some other important features of the act include bureaucratic organization, means of expropriation and compensation, time frame for implementation, and arrangements to transfer title to the target group. The act authorizes the formation of the ALRO in the Ministry of Agriculture and Cooperatives with status equivalent to a department and provincial land reform offices under ALRO supervision in decreed land reform areas. Funds for operating ALRO programs will come from the national budget, foreign assistance, aid-to-farmers fund, and fees collected from project beneficiaries for project investments and land purchases. These funds will be deposited in a special revolving account supervised by the Ministry of Finance. The ALRO is given a functional assignment to carry out land reform as mandated by law and a social position within the bureaucratic hierarchical system.²

The ALRO is not solely responsible to the Ministry of Agriculture and Cooperatives. An Agricultural Land Reform Committee composed of eleven government officials, including the Secretary General of the ALRO, four learned persons, and three farmers determine the policies, measures and regulations carried out by the ALRO. Included among the duties of this committee are: 1) designating which state-owned land can be reformed;

¹Ibid., Section 29(3).

²Ibid., Sections 6, 7, 8, 9, and 10.

2) decreeing land reform areas; 3) determining layouts and allocation of lands within the land reform area; 4) developing plans for agricultural development, including production, marketing, and extension facilities; and 5) establishing procedures for selecting farmers, allocating land, supervising loans, and monitoring ALRO activities.¹ The committee spends much of its time reviewing and critiquing plans and criteria prepared by the ALRO.

Once a land reform area has been declared, a provincial land reform committee, composed of six provincial officials (one local official from the land reform area, and three farmers) is established. Though this committee is under the supervision of the ALRO, they approve the plans, projects, and budgets of the provincial land reform office, monitor actual project implementation, and establish work performance criteria to be followed by the provincial office.²

The law states that the land reform program must be implemented without delay. Tenure surveys of agricultural land and initiation of land reform projects in every province must be completed by three years from the effective date of the act.³ The act was put into effect in 1975. By the end of 1978, all surveys and development plans will have to be completed.

Expropriation procedures are to follow those guidelines set down under the real estate codes. Compensation will be given to those whose land has been expropriated. The Agricultural Land Reform Committee will determine the amount of compensation, based on soil fertility, location, and prior acquisition price. Once the price has been agreed upon, 25 percent

¹Ibid., Sections 12 and 19.

²Ibid., Sections 13 and 20.

³Ibid., Section 25.

of the price will be paid in cash, the remainder in government bonds with a minimum interest of 8 percent to be redeemed in ten years. If the landowner and the committee do not agree, the landlord can file a petition with the Petition Committee. The case can be taken to court if the landowner is still not satisfied with the outcome.¹

Several control measures have been put into the act. First, land transactions are frozen in a declared land reform area for a period of three years unless special permission is given.² The intention of this section is to keep land owners from making land deals which would enhance their position. Second, land located in land reform areas cannot be subdivided or transferred to any other person except heirs, a farmers' institution, e.g. cooperative, or the ALRO. This is to prevent fragmentation or the loss of land to merchants or other individuals who have financial dealings with land reform participants. Finally, land, classified as state-owned or received from the Crown, will only be leased not sold to farmers. Only land purchased or expropriated from landlords can be resold. The intention here is to make sure that reformed land does not get back into the hands of the absentee owner.³

The Acts' Weaknesses: Summary

The government recognizes that tenancy will not be entirely eliminated and has passed legislation (Rent Control Act) to improve the position of the tenant relative to the landlord. In areas where tenancy is seriously high land, can be expropriated with compensation and redistributed to tenants and landless people. Much of the land currently coming under

¹Ibid., Sections 34, 35, 36, 40 and 42.

²Ibid., Section 28. ³Ibid., Sections 28, 30, and 39.

reform is in the public domain or has been donated by the Crown. Plans have been developed by the ALRO to assist land reform participants by providing support services needed to insure improved production possibilities and easier access to information on new inputs and to market outlets.

From the above review of land reform legislation, it is evident that the land reform program is limited in scope and serves a specific audience. To accomplish the tasks required in the law, the ALRO will have to assemble up-to-date land records and title registrations, provide specialized services to insure the beneficiaries will succeed as entrepreneurs, integrate their programs into the nation's national development program, and adjust priorities to the manpower skills and organizational capabilities of the ALRO.

Even though the Land Reform Act has been influenced by the successful Taiwan experience and many shortcomings which have led to failures in other reform efforts have been accounted for in this legislation, a number of weaknesses do exist. The most noticeable weakness is the liberal farm size exemptions extended to large landowners and the opportunity for absentee landowners to become full-time operators. The obvious intention of these exemptions is to protect the status quo. Many officials fear that the agricultural sector will collapse if land reform is extended to all farm land. Since agriculture plays such an important role in Thailand's foreign trade¹, any policy which might affect agriculture

¹According to the National Economic and Social Development Board in its report, National Income of Thailand, 1974-75 Edition (Bangkok: NESDB, 1975), p. 62, agriculture's share of the gross domestic product was 32 percent in 1974, but this figure is misleading as the manufacturing sector's share of GOP is generated through the primary production of agricultural products. Ingram points out agriculture's contribution has steadily increased; simply not as fast as other sectors of the economy--see Economic Change, p. 235.

production is usually undertaken with caution. Doreen Warriner cautions that "the more scope for exemption, the more scope for litigation and corruption."¹ Certainly liberal exemptions will weaken the intent of the land reform legislation.

The expropriation and compensation process is not clearly spelled out in the act. There is some question on the legality of the method of compensating landowners. Legislation has been introduced in 1976 to correct this deficiency, but because of political instability the needed enabling legislation has not been passed. This has meant that private lands have only been obtained if landowners have voluntarily sold their property to the ALRO. To meet all its mandates, the ALRO has proceeded to initiate development projects on all lands in declared land reform areas regardless if all titles have been purchased by the ALRO. This type of action could have serious consequences. If landlords do not have to give up their lands, they can capture most of the benefits generated by the irrigation projects.

Another big problem stems from the organizational structure surrounding the ALRO. Because the ALRO has to report to two different superiors, the Minister of Agriculture and the Agricultural Land Reform Committee, and the provincial land reform offices have limited power over certain ALRO actions, the ALRO is not in a position to strongly push the tenants' interests. The ALRO has little autonomy to follow its own course of action to obtain its objectives. Other interests can easily interfere and slow down the land reform program.

The composition of the various land reform committees includes farmers, but these are merely token representatives. Because of the

¹Warriner, Land Reform, p. 19.

hierarchical and paternalistic nature of society (see Chapter III), farmers will not actively participate in the verbal interchanges at committee meetings. To be successful, reform must have active participation of project beneficiaries.¹ This type of participation has not been considered in the land reform act.

Many farmers were upset when told that land reform lands would be leased not sold. Many tenants and landless farmers have an urgent desire to acquire their own property--they do not want to lease property, however generous the terms. After lengthy deliberation, the ALRO has modified its position on this section of the act. All land will now be eligible for purchase with the stipulation that the land must either be inherited by a legal heir or sold to another farmer approved by the ALRO or the ALRO, itself. This approach has been accepted by land reform participants.

The ALRO faces another serious problem in coordinating and providing the necessary support services needed at the farm level. This problem will be examined in the next chapter.

Having good effective legislation is an essential ingredient to a successful land reform program. As written, Thailand's land reform law has some serious weaknesses which could limit the activities of the ALRO, rendering the whole program ineffective. Land reform legislation should be strengthened before the entire process is possibly undermined by opposing interests.

Land Reform Program

In designing a development program which will provide the support services needed to expand agricultural production, the ALRO has borrowed ideas from the cooperative format successfully set up by the Public

¹Dorner, Land Reform, p. 50.

Welfare Department in various land settlements throughout the country. Likewise, irrigation development schemes have been borrowed from the land consolidation experience in the upper Chao Phraya River basin. Before examining the land reform program, a brief overview of the land settlement program and land consolidation efforts is considered appropriate.

Land Settlement Program

Pressures on land resources were building up in various parts of the country during the first several decades of this century. In an attempt to provide land to landless families and families with holdings too small to provide subsistence, the Department of Public Welfare was given the responsibility to establish land settlements. The main objective of these settlements was to raise incomes and the standard of living of the participants via occupational development. The philosophy behind these settlements was "self-help"; through mutual assistance settlers would reach self-dependence. To encourage mutual cooperation, cooperatives were organized and supported by the government. Unfortunately, this philosophy did not work because of social and cultural factors (see Chapter III) and the government was forced to become more involved.

Prabuddhabad Settlement, Saraburi, is the oldest settlement (established in 1941) and has received world-wide attention for its success. Most of this success can be contributed to an energetic nucleus of farmers, who organized the cooperative, dedicated German technical advisors, and sound bureaucratic administration from the Land Settlements Division of the Public Welfare Department. Over the last thirty-five years, fifty more settlements have been started.¹ Not all of these have been as

¹This section is concerned with the land settlement program of the Public Welfare Department. It should be pointed out that six other departments also supervise their own land settlement programs.

as successful. Still the majority are doing well enough to suggest that positive gains are being made to improve the settlers' welfare.

The major responsibility of the government is to set up an integrated farming program. This program coordinates such activities as production, marketing, promotional services (including the provision of fertilizers, seeds, insecticides, and credit) and the formation of co-operatives.¹ Each settlement has a different integrated program designed to meet the physical-biological, social, economic, and political factors found within the settlement area.

Five key functions are performed by the government in most settlement areas. First, government agents administer the marketing of farm products. Working through the cooperatives, the collection, grading, storage, and transporting of the farm products is closely supervised. If certain facilities, e.g., storage silos, are needed, the government will make provisions to provide such facilities. Second, all needed inputs will be supplied by the government and distributed through the cooperatives. Third, experimental plots will be set up on pilot farms to demonstrate new techniques. Fourth, the government will develop water resources to insure against losses during drought periods. Finally and most importantly, promotion of education and training of settlers so they can effectively handle new farming techniques,²

The backbone of the settlement program is the settlement's agricultural cooperative. Multi-purpose cooperatives were initially formed so farmers could receive low-interest government loans. As they mature, they take

¹Department of Public Welfare, Statement of Development Policies in the Land Settlements (Bangkok: Ministry of Interior, n.d.), p. 28.

²Ibid., pp. 30-31.

on more and more of the business functions being carried out by government agents. A few cooperatives have entered the multi-purpose stage and have been able to market their products, acquire and distribute necessary production inputs, guarantee loans, and provide other farm services. Success has its price--cooperative members have had to work very hard and overcome many frustrations and uncertainties in achieving their goals.

Self-help successes have attracted the attention of other departments who have initiated similar programs. Lin and Esposito are hopeful that all these efforts are successful in order that the farmer can free himself from the usury and illicit practices of the merchants.¹

Land Consolidation

Water control has always been a major objective of the government since the mid-1800's. Canals and dams have been constructed to control flooding and open land for cultivation. Today, the water control system is based on a series of dams throughout the upper reaches of the Chao Phraya River and its tributaries and on other rivers in various regions of the country. These dams and the main and lateral canals which were constructed concurrently are also the main support facilities for the country's irrigation system.

Originally, government officials anticipated that individual farmers or groups of farmers would construct their own on-farm irrigation systems as soon as they recognized the benefits of intensified agriculture. This type of action did not materialize and the government legislated and promoted a Ditches and Dikes Project.² This project entailed the

¹Lin and Esposito, "Agrarian Reform," p. 429.

²Sanyu Consultants, Inc., Study Report on Land Consolidation Project in Thailand (Tokyo: Engineering Consulting Firms Association, March 1975), p. 14.

construction of diversion weirs and lateral canals in order to distribute water to individual farm plots. Land leveling was not part of the project design and problems soon arose: (1) yields varied because some land could not be irrigated; (2) farm management was difficult, especially for new crops, because of the uncertainty surrounding water supplies in upland areas; and (3) new machinery could not be introduced because there were no farm roads.¹

Realizing that water was still not being used efficiently, the Land Consolidation Act was enacted in 1974 to promote the use of water resources to increase agricultural productivity. Prior to passage of this bill land consolidation had been successfully tested in two pilot areas, Sappaya and Chanasutr. In each of these areas, on-farm irrigation and drainage facilities were constructed, as well as a farm road network. Each project involved some degree of land leveling and minor reparceling of land holdings--farm size was changed by only 4 to 8 percent.²

The Sappaya project was designed by a Taiwanese technical mission in 1968. In addition to improving the existing ditch system, the project called for intensive land leveling, reorganization of farm plots into regular units and construction of farm roads. This approach demanded a high rate of investment (approximately \$93 per rai³) to cover the costs of acquiring heavy machinery and other construction costs. One of the major problems faced during implementation was conflicts over the reorganization of field plots. Many farmers did not understand what was happening and resisted the project, thinking they would lose their land.

Land consolidation in Chanasutr was implemented by the Dutch consulting firm, ILACO, beginning in 1968. The Dutch method was not as

¹Ibid., p. 15. ²Ibid., p. 29.

³Ibid., p. 23 (6.5 rai = 1 hectare).

intensive as in Sappaya. Land was leveled in accordance with the topography of the land and farm units were not reorganized, unless absolutely necessary, minimizing the conflicts with farmers. Construction costs were much less than in the Sappaya area, ranging from \$33 to \$49 per rai,¹ depending on the amount of leveling and number of ditches and farm roads required in the area.

Both of these projects were technically oriented toward the improvement of the irrigation and drainage system. Water management also required a wide variety of agricultural services to insure that agricultural productivity will increase. Each project has included means of introducing new farm methods, particularly those related to irrigation, and improving institutions for marketing the new crops. When completed, land consolidation will help improve all aspects of the rural environment.

Current Land Reform Program

In the first year of operation (November 1975 to October 1976), the ALRO centered its major activities on obtaining Royal Decrees which proclaimed certain lands as land reform areas, conducting socio-economic surveys, undertaking mapping and cadastral surveys, beginning work on initial project designs, and supervising land ownership registration. Land was purchased from the Crown Property Bureau, but no other private land was purchased or expropriated. No land was reallocated to tenants or small farmers during this time.

Implementation schedules have been prepared for the fourth five-year plan (1977-1981) and for the fiscal year 1977. Long range projections call for the ALRO to carry out land reform on about 60 million rai, 13 million

¹ILACO, Land Consolidation Project in the Central Plain of Thailand, Vol. I (2 vols.; the Netherlands: Department for International Technical Assistance, 1973), p. 48.

rai of private land and 47 million rai of deforested public land. The time frame for this program is about 30 years. In the next five years, the ALRO has scheduled implementation on 15 million rai which will be done in stages over a nine year period. The office hopes to actually implement 10 million rai every five years.

The implementation plans for fiscal year 1977 are more detailed. The target area is one million rai, comprised of 300,000 rai of private and Crown land (48,000 rai) and 700,000 rai of public land. These lands are found in 20 Changwats (43 different amphoes) throughout the country. Approximately 40,000 farm families will be allocated land during this fiscal year.

Problems are expected regarding land acquisition since, as was pointed out above, the law has not been amended clarifying the guidelines for acquiring private lands. Early emphasis for pilot development projects will be on Crown land and public land. In the Central Plains region about 40,000 rai will be developed. Another 80,000 rai, mainly deforested public land located in the North and Northeast, will be improved.

Development occurs in two stages. In stage I, there is a temporary reallocation of land, up to 50 rai per farmer. The individual will be given a contract which stipulates that after land improvements have been made a farmer may have to relocate or give up some of the allocated land. At the same time, the project design is formulated. In stage II, construction is begun on the development project. The final step involves the permanent reallocation of the land and final settlement of the farmer.

Two types of development schemes are being planned. A complete comprehensive land reform project provides all types of facilities ranging from on-farm irrigation to farm houses. Of the one million rai targeted

for 1977, 120,000 rai will be comprehensively developed. The remaining rai will be reallocated to the farmer accompanied by only minimum facilities and extension supervision.

Comprehensive development is based on the production unit model, a working norm for all planning efforts (described in Appendix B). The basic unit is a farm cooperative which can support 400 families, cultivating 25 rai of irrigated land. Irrigation facilities are designed and constructed according to land consolidation procedures most applicable to the area. The farm cooperative operates like those in other land settlements. All necessary services will be provided by the ALRO, until the cooperative can manage on its own. After relinquishing most of its business functions, the ALRO will continue to supervise these cooperatives and monitor all land transactions.

Organization of the implementation program finds four groups undertaking development projects. Other government departments, i.e., Irrigation Department, Applied Scientific Research Corporation of Thailand, Department of Cooperative Promotion, State Highway Department, and Land Development Department, will be responsible for implementing approximately 426,000 rai. Private companies will work on approximately 478,000 rai. The ALRO will implement projects on nearly 262,000 rai.¹ International assistance groups will assist the ALRO in selected project areas. Since the transfer of budgetary funds to other governmental agencies has not been approved by the Minister of Agriculture, the ALRO will be responsible for initiating work in those areas assigned to other departments.

¹Total rai comes to more than one million as the ALRO has added additional public land for possible implementation.

Summary

This historical review of Thailand's land policy has revealed some interesting points on the land code, land tenure, and land reform legislation. For most farmers, the land titling procedure is very difficult to understand. Few follow the legal procedures preferring to squat on public domain. As a result a relatively small number of farmers have title deeds to the land they cultivate. Those who do have title deeds are located in the vicinity of Bangkok or in the fertile areas of the Central Plain and river valleys of the North.

Tenancy varies throughout the country depending on the ecology, technology, and historical economic development of an area. An increasing population has put pressure on land resources in several areas, particularly in the North. Expanding irrigation facilities and new farming methods has caused traditional attitudes toward the land to change. As commercial agriculture becomes a more dominant feature of rural life, traditional behavior will change especially among the aggressive and successful farmers. The highest tenancy rates are found in the Central Plains region and can only be understood if an observer considers the interrelated socio-economic factors behind the tenancy situation. One important factor was the use of land grants to encourage internal improvements via the expansion of the canal system. Even with the increasing amount of data available on land tenure, it is difficult to establish whether rural land conditions are deteriorating.

High tenancy rates may be acceptable, if the tenant has a good relationship with the landlord. In the North, the landlord has traditionally participated with the tenant in making cropping decisions, provided the necessary production inputs, and maintained the irrigation structures. This

type of relationship has led to a productive agricultural environment. On the other hand, evidence from the Central Plains suggest that landlords tend to exploit tenants by charging high rents while not providing any of the production inputs. In this case, the tenants position could be improved by government action taken to correct improper tenant contracts.

The Thai government has passed several bills in attempts to improve the land tenure situation. A Land Rent Control Act, imposing a maximum rental level and insuring long-term leases, was enacted in 1975. Previous rent control legislation has proven ineffective and early indications are that the new act is not being enforced.

The Agricultural Land Reform Act can be characterized as narrow in scope and serving a restricted clientele. Though the act's intentions are laudable, the enacted legislation contains some major weaknesses. Numerous exemptions to the size limitations set on farm holdings is the major weakness. These provisions allow many landowners the opportunity to evade coming under land reform. Other weaknesses include ambiguous procedures for expropriating land and paying compensation; bureaucratic organizational features which complicate coordination of activities; inadequate incentives of insuring farmer participation at all levels of decision-making process; and inconsistencies in time frames, e.g., conflict between time set for implementation and amount of time for filing appeals. These weaknesses could seriously jeopardize the success of the land reform program.

Finally, the program, developed to implement reform, has been spread over several decades and is primarily focusing on Crown and public land. Comprehensive development will be carried out in areas where irrigation

is feasible. This approach calls for close cooperation between government agencies to provide the agricultural and domestic infrastructure. The ALRO will be in charge of coordinating all these activities and insuring all necessary support services are available when needed. The eventual success of land reform depends on the ALRO making positive strides in implementing comprehensive programs.

CHAPTER III

INSTITUTIONAL SETTING

Simply passing land reform legislation does not insure that the stated policies will be implemented. A number of forces, historical, cultural, social, administrative, and technological, are interacting throughout the various levels of society. At times, these interactions speed up and facilitate reform; at other times, confrontations occur slowing down and obstructing implementation efforts. Confrontations must be expected, since land reform will inevitably alter the status quo through the redistribution of power (political and economic) and social influence. Individual and group action, in efforts to protect their own interests, exert pressure in favor of or against land reform. Most of the time, the obstacles are very difficult to overcome.

To understand the obstacles facing Thailand's land reform program, it is necessary to consider the organization of the agricultural infrastructure which coordinates and supplies farm services, the level of technology in rural areas, the prevailing social and cultural institutions, and the goals which motivate individuals and groups within these institutions. In this chapter, two broad groups of institutions will be examined. First, the actors involved in the land reform process will be introduced and described through the cultural, social, or political institution to which they belong. Major emphasis will be given to those factors which influence the behavior of these actors and the impact of their behavior

on the land reform program. Second, a selected group of agricultural service institutions will briefly be evaluated as to their ability to assist the ALRO in providing the necessary services to sustain and consolidate the beneficiaries in their new positions.¹

Cultural-Social-Political Institutions

Seven major groups can be identified as potential actors involved in the implementation of the land reform program. Included in this drama are the Buddhist religious order, the monarchy, the political establishment, the rural population, the civilian bureaucracy, absentee landlords, and the business elite. The latter group, composed primarily of Chinese businessmen, does not play an important role in the implementation stage of land reform since very few Chinese own large tracts of agricultural land. Absentee landlords cannot easily be identified as a distinct group because its members are found throughout the political establishment and the bureaucratic ranks. The modern socio-political-economic system encompasses a wide variety of institutions nurturing various forces which influence how public policy is carried out. Each of these groups will be briefly described and examined to determine its cultural foundations, its impact on social goals, and its affect on the implementation process set up for the land reform program.

Religion

Buddhism is the predominate religious organization in Thailand. Over 90 percent of the population² follows the teachings of the Buddha. The

¹Sein Lin, Land Reform Implementation: A Comparative Perspective, (Hartford: John C. Lincoln Institute, 1974), p. 56.

²Marcus D. Ingle, Local Governance and Rural Development in Thailand, Center for International Studies (Ithaca: Cornell University, 1974), p. 5.

country's religious beliefs are a combination of Hindu animism, introduced from India, and Theravada Buddhism. Animistic worship aids the peasant in understanding the events of his daily life.¹ Buddhism prepares the individual for the next life or the escape from the earthly world into a nirvana. These practices influence individual and group behavior as a person prepares for this transition to a better life.

Buddhist tenets encourage individualism, disapprove of the accumulation of material goods, and support the existing hierarchical social system. Each man is responsible for his own acts; other individuals or organizations cannot aid him on his journey to a better life. Since man's earthly state is only temporary, there is no need to be caught up in a material existence. By being content with one's current situation, an individual can improve his position during the next stage of life; proper conduct is more important than conspicuous buying of consumer goods. Finally, proper conduct supports the social structure by recognizing that those in higher social positions are people with high merit (good deeds to be used in next life) who have advanced through proper conduct. Buddhism nurtures the basic values and attitudes found within Thai society.

One observer of Thai society has stated that the Buddhist religious order was weak and had relatively little power to influence government policy.² True, Buddhist monks have never involved themselves in public policy decision-making; yet, the teachings of Buddha do have a very pervasive influence on the implementation process.³ According to the

¹John E. deYoung, Village Life in Modern Thailand (Berkeley: University of California Press, 1955), p. 110.

²Walter Vella, The Impact of the West on Government in Thailand (Berkeley: University of California Press, 1955), p. 317.

³Joseph L. Sutton, "Political and Administrative Leadership," in Problems of Politics and Administration in Thailand ed. by Joseph L. Sutton, Institute of Training for Public Service (Bloomington: Indiana University, 1962), p. 5.

beliefs of Buddha, nothing should be undertaken that changes the status quo¹ because affairs of the materialistic world are meaningless. In this way, Buddhism has provided no ethical guidelines for positive government action and has dissuaded the general population from taking an active interest in government policies.²

The location of the temple in the center of the village represents the important cultural and social position given Buddhism by the villagers. The temple serves as a source of information from outside the village. In many rural areas, the only education young children receive is from the monks at the temple. Also, the abbot often serves as the community spokesman in discussions with government officials. Thai Buddhism serves as a powerful socializing and acculturating force³ within Thai society. To the Thai people, Buddhism is the most sacred and popular of Thailand's institutions.⁴

Indirectly, Buddhism will be an obstacle to the implementation of land reform, especially because the religion's basic tenets and accepted practices influence the individual's and group's behavior pattern.⁵ If land reform should greatly alter the status quo, rural peasants may resist such changes, even those changes which directly benefit them. More importantly, few rural people will take an active interest in the government's land reform program. The lack of interest for participation in land

¹William J. Siffin, The Thai Bureaucracy: Institutional Change and Development (Honolulu: East-West Center Press, 1966), p. 14.

²Sutton, "Leadership," pp. 6-7.

³Siffin, Thai Bureaucracy, p. 12.

⁴Fred W. Riggs, Thailand: The Modernization of a Bureaucratic Policy (Honolulu: East-West Center Press, 1966), p. 104.

⁵For a good description of how rural society and religion interact see deYoung, Village Life, pp. 110-46.

programs can be blamed on the highly centralized decision-making process of Thai bureaucracy which will be discussed below; and, secondly, the religious institution which supports the hierarchical structure of society and preaches that only individual actions, not collective action, determines one's existence. This could be a crucial factor because the success of the land reform program depends on the active participation of those people directly affected by the reform.¹

Over the last few years, rising expectations have made many villagers much more materially oriented. With each passing year, remote villagers have been brought via improved transportation and telecommunication facilities into the consumer economy. Radios, televisions, motorcycles, and mechanized farm equipment have wetted the rural people's appetite for more consumer goods. Buddhism has not been able to accommodate for this shift in behavior. As a result, farmers have been more willing to participate in government programs which draw them into the market economy and allow them to purchase the products they desire.² By expanding expectations, the land reform program may be able to minimize the obstacles presented by the Buddhist religious institution.

Land reform also receives the support of the chief patron of the Buddhist religion--the king. As the secular head of the religious order, the king can influence the religious order in ways which will minimize their possible opposition to land reform. Before exploring the role of the monarchy in land reform, a summary statement may be in order. It

¹Dorner, Land Reform, p. 50.

²This slow erosion of some of the basic Buddhist tenets was reported by David F. Pfanner and Jasper Ingersoll in "Theravada Buddhism and Village Economic Behavior: A Burmese and Thai Comparison," The Journal of Asian Studies, XXI (1961-1962), 341.

should be remembered that Buddhism supports the country's social order and sustains stability within the society's social structure. How much of an impact this institution will have on land reform cannot be determined; still, Buddhism should be recognized as a significant force during the implementation process.

Monarchy

Not only does the king serve as an agent linking religious attitudes to the social and political aspects of society, he acts as a symbol of national unity whom the people loyally support. In the traditional Thai system, all decisions were made by the king. After the overthrow of the absolute monarchy in 1932, the king's decision-making prerogatives were taken from him. He has, however, been able to retain the very important function of legitimizing all governments and their programs. Through the legitimizing process, the king does have input into government policies, especially those policies which he supports. An outside observer may consider this function to be political in nature, but the Thais are quick to reaffirm the non-political status of the king.

Bureaucrats, because of their traditional association with the monarchy, respond to the king's request for action particularly in those programs he patronizes, e.g., hill tribe development projects and several land settlement schemes. The king has donated royal land holdings to the ALRO for redistribution to land reform participants. For this reason, he has a stake in the successful implementation of land reform. At times, he has directly asserted himself into the implementation process to speed events along.

The personal interest and support the king has shown in land reform legitimizes the ALRO's programs and signals the high priority it has

within society. Unfortunately, even with all the king's support, land reform still faces some very formidable obstacles.¹

Political Establishment

A western style constitutional government complete with various institutions of political control, e.g., parliament, political parties, a prime minister, free press, courts and an electoral system, was designed to replace the absolute monarchy after the 1932 revolution. Popular democracy was seen as the proper course to finish the modernizing process of the government. Unfortunately, the outcome was different, but not totally unexpected. In practice, these institutions were merely formal expressions of what was in the constitutions while power rested with the military and civilian bureaucracy.²

There have been periods in 1946 and 1973 when the country has experimented with democracy--each time to be replaced by military backed government. Recently the country adopted the thirteenth constitution since 1932, still confused over the degree of democracy to allow and the type of parliamentary structure most adaptable to the social and cultural norms of the country.³ This inability to construct a firm political institutional base would suggest that the peoples' interests are seldom represented by the political establishment. The question can be raised

¹Because of continuing political instability, the king has become the greatest unifying force in the country. To see how the king's power has grown over the last couple years refer to Thomas A. Marks, "The Status of the Monarchy in Thailand," Issues and Studies: A Journal of China Studies and International Affairs, XIII, No. 11 (1977), 51-70.

²Riggs, Thailand, p. 148.

³Robert Shaplen, "Letter from Bangkok," The New Yorker (July 24, 1978), p. 43.

as to the usefulness and purpose of political institutions in Thailand. By examining a few of them, an explanation of how political institutions operate can be formed.¹

Interest groups and political parties are quite common. In the election, held in January, 1975, forty-two parties sponsored candidates and twenty-one parties were represented in newly elected Parliament. Having this many parties weakened Parliament and a new election with fewer parties was called. Political parties and interest groups are weak and unable to coordinate activities to achieve mutually desirable goals. Riggs attributes this weak political position to: (1) lack of funds; (2) small membership; (3) cultural values uncongenial to organizational discipline and cooperative action; (4) beliefs and values which linked ascriptive criteria of membership to functional goals of organizations; (5) the limited extent of the socially mobilized sectors of the population in a small country; and (6) legal restrictions on freedom of organization.³

Political interest groups are not organized under the premise of representing the collective interests of a group of people. Rather, they are deliberately organized and run by top bureaucratic politicians to enhance their power base.⁴ This is especially true in communication organizations, e.g., newspapers, radio stations, and television stations, which are mainly controlled by government agencies and influential officials. As power shifts from one group to another, political parties are reorganized, organized or dissolved depending on the fortunes of the elite who organized

¹For an in-depth examination of Thai political institutions, see David A. Wilson, Politics in Thailand (Ithaca: Cornell University Press, 1962), and Riggs, Thailand, pp. 211-396.

²Shaplen, "Letter, p. 44.

³Riggs, Thailand, p. 150. ⁴Ibid.

the party. Without any sense of continuity in the system, political parties can contribute little in the area of public policy decision-making.

Parliament, the arena for debating public policy, is not taken too seriously because the members spend most of their time arguing among themselves, instead of formulating public policy. Parliament is mainly used to legitimize decisions already made by the bureaucratic elite.¹ For most politicians this function is self-serving, because it minimizes the risk of being defeated in the next election.

The real power behind the scenes is the military and civilian bureaucracy. Both these groups have remained strong, even in the face of serious threats to their existence. The military was jolted by the revolution in 1973, but it remained quiet and maintained its connections with business and the monarch. Currently back in control of the country, they are the strongest institution in the country. Civilian bureaucrats were shaken by events between 1973 and 1976 because attempts were made to reorganize the bureaucracy. A lot of time was spent in power plays designed to protect each ministry's self-interest. Because of the instability of the political system, reorganization plans were never implemented and the civilian bureaucracy has remained intact. These two groups have been able to resist attempts by outside political groups from controlling the government and remain the primary focus of power in the country.

Of those two power sources, the military has been the most receptive to the land reform program because of the contributions land reform could make toward insuring rural stability. In a speech before a military seminar on village defense, Chaiyong Chuchart stressed this point and

¹Ibid., p. 153.

elaborated on how land reform could bring about rural stability.¹ Because of other problems, primarily the October 1976 take over of the government, the military has not actively supported land reform. At least, they have some indication of what land reform could do if properly implemented.

Wolf Ladejinsky has stated that the key to land reform is the desire and will of the government to take effective action.² Land reform depends on the political drive behind enacted legislation. In Thailand, political institutions do not exist to push for the implementation of public policy. Without this key ingredient, land reform can be expected to move slowly, as was pointed out in the previous chapter.

Rural Population

According to Peter Dorner, for land reform to be carried out successfully, the program must gain "active participation of the people directly affected by the reform."³ It is usually accepted by rural development specialists that once the rural population realizes the benefits from government sponsored projects, they will become more active in these projects. This has not generally been the case in Thailand for two reasons. First, peasants are unwilling to participate in government projects because of cultural and social norms. Second, the government's unwillingness to involve local people in the decision-making process. The purpose of this section is to examine why rural people do not eagerly participate in development projects.

¹Royal Thai Government, Sixth Seminar on Village Defense and Development (Bangkok: Royal Thai Government, May 1976), Appendix A.

²Walinsky, Selected Papers, pp. 11-19.

³Dorner, Land Reform, p. 50.

Thailand has been defined as a "loosely structured" society,¹ which suggests that social regulation has little influence on the behavior of individuals. Traditional Thai society relies on a set of individual relationships between superiors and subordinates and the farm household, as the basic economic unit. Individual freedom of action is more important to rural residents than communal projects and cooperation.²

Another factor which hinders communal organizing efforts is the absence of local vested interests which could form organizations to make demands on the government. Taken together, these factors help explain the apolitical nature of the rural population. Instead of getting involved in the affairs of the government, most rural people keep to strictly personal affairs.

There are regional differences to this general stereotype, for example, local irrigation associations are common throughout Northern Thailand. These associations rely on the cooperation of all project beneficiaries to participate in the maintenance of the system and in the election of the canal chief who is responsible for distributing water, supervising maintenance, and organizing manpower for new irrigation construction. Until recently, the government has had little input into these organizations which still remain non-public enterprises. Because the central government in Bangkok has shown little interest in outlying regions, the North, Northeast, and South have largely been self-sufficient.³ In these regions, local government and communal organizations are more important

¹John F. Embree, "Thailand--A Loosely Structured Society System," American Anthropologist, LII, No. 2 (1950), 181-193.

²Herbert P. Phillips, Thai Peasant Personality: The Patterning of Interpersonal Behavior (Berkeley: University of California Press, 1965), p. 17.

³Ingle, Local Governance and Rural Development, p. 95.

than government sponsored organizations. Ingel suggests that the higher level of legitimacy granted local governments can be attributed to jurisdictional boundaries which correspond closely to natural (kinship) communities.¹ This preserves the traditional relationships in a community and does not compromise an individual independence.

In the Central Plains, the central government has taken a more active role in local affairs, essentially neutralizing the prerogatives of local governments. Organizations have been set up by the central government to encourage expansion of the commercial agricultural economy, primarily cooperatives. These organizations have enjoyed some modest success (see summary of cooperatives below), but they still are not enthusiastically received by many farmers. Often the participants do not understand why the organizations were established or how they operate. Many farmers, facing increasing pressures from the demands of commercial agriculture, feel they are losing their independence. To retain some independence, they have resisted efforts involving them in government sponsored projects.

Rural perceptions of government vary depending on the individual's or community's past experience with government officials. In projects which change traditional practices, rural people appear reluctant to take on large risks and they are especially afraid to fail. This does not mean farmers will not try something new. They are eager to pursue new opportunities, as long as they do not deviate significantly from traditional practices. Some government projects are too elaborate or unusual to generate enthusiasm from farmers, resulting in poor performance and eventual failure.

Failure in an hierarchical system has a serious consequence. Government officials enjoy a higher status than the majority of the rural

¹Ibid., p. 71.

population. If a project fails, the political and bureaucratic officials are held responsible jeopardizing their status and authority. Failure lowers the influence government has with the rural population who disassociate themselves from further government activities.

A damaging attitude which persists in rural areas centers on the gift idea that government projects are gifts to the people. Young describes this viewpoint in this way:¹

Villagers see government as fulfilling its duties itself as an individual agent and then turning over the finished results to the people; citizens tend to their private concerns while government hands them a better life on a platter.

Gifts do not involve participation--the exchange is in one direction only. This attitude undermines attempts to get project beneficiaries to pay for investments made in their behalf.

The government is not faultless in perpetuating these perceptions. First, the government has poor communications into rural areas. Government officials often determine what is best for the people without consulting the preferences of the populace. If communication channels do exist, they are from the center outward with no feedback mechanisms to monitor the responses of the people. Second, closely related to centralized control of the communication system is the centralized decision-making process. The central government does not involve local organizations in project planning. Local governments have very little decision-making authority and must wait for higher government officials to respond to their problems.² Finally, poor coordination between government agencies

¹Stephen B. Young, "The Northeastern Thai Village: A Non-Participating Democracy," Asian Survey, VIII, No. 11 (1968), 878.

²The tax system where the government has relied on a rice premium rather than directly taxing rural people, disguises the costs of government and perpetuates the one-way communication and decision-making channels.

and between agencies and rural people lead to confusion. All these factors increase the distrust of officials, reduce the willingness of rural people to participate and enhances the attitude that government projects are gifts to the people.

A rural farmer is faced with two basic areas of tension: (1) rising conflict between desire for independence and the necessity of becoming dependent on others; and (2) conflicts between desire for security provided by traditional social relations and insecurity when these relationships no longer meet his needs.¹ These tensions are a direct result of the impact of commercial agriculture. As a farmer moves from subsistence to market economies, the environment he operates in changes. More and more reliance has to be placed on government agencies to provide a whole list of items. This shift in reliance has caused some changes in rural perspectives --a willingness to become involved in government projects. Still, the individual is the central figure in the social system. It is his attitudes toward the government which will determine the success of a project regardless how his tensions are resolved.

Civilian Bureaucracy

Earlier in this chapter, the civilian bureaucracy was described as one of the focal points of power in the country and that political decisions were initiated by the bureaucratic elite. Firmly rooted in the traditions of the country, the bureaucracy has been able to nurture its power and lend stability to a changing country. On the other hand, each department covets its own power and protects its self-interest by an unwillingness to cooperate with other agencies who pose a threat to their existence. This section is concerned with the historical evolution

¹Phillips, Thai Peasant Personality, p. 51.

of the modern bureaucracy, its acquisition of power, and the problems of inter- and intra-departmental cooperation.

Thai bureaucracy between the thirteenth and mid-nineteenth centuries was relatively small and composed of members of the royal family and the wealthy elite.¹ During this period, the bureaucracy played two important roles, functional and social.² Functionally, it was established to serve the king and assist him in governing the kingdom. Several ministries, e.g., treasury, law and order, and land, were organized and housed a collection of agencies interested with carrying out specified tasks. Loyalty was maintained in the structure by a system of oaths and awards. Oaths were particularly important in maintaining control of officials located in the provinces. One might expect performance to be based on edicts and commands from the king.³ However, performance was geared more towards inaction, doing nothing, rather than generating programs and public policy.

The social role was more important than actually serving the king; in this capacity the bureaucracy provided a stable and coherent social order. Bureaucratic organization was a detailed system of status, covering every level of society. In the Ayutthaya period (1448-1767), status was determined by the number of dignity marks or "sakdi na" a person had. At first, these marks were related to the amount of land an individual controlled. The social structure can be pictured as a pyramid with commoners who could own 25 rai on the bottom and members of the royal

¹There are several excellent historical studies of Thai bureaucracy, from which this section has been drawn, particularly: Siffin, The Thai Bureaucracy; Sutton, Problems of Politics; Riggs, Thailand; and James N. Mosel, "Thai Administrative Behavior," in William J. Siffin, ed., Toward the Comparative Study of Public Administration (Bloomington: Indiana University Press, 1957).

²Siffin, The Thai Bureaucracy, p. 17.

³Ibid., p. 25.

family who could own 100,000 rai on the top. Eventually the merit system moved away from landholding criteria to a patronage format where titles were given to individuals on the basis of the number of marks they had accumulated. The end result was an elaborate hierarchical system based on a set of expected performances at each level.

Bureaucratic behavioral characteristics depended on four factors: (1) the hierarchical system for defining and differentiating status and role; (2) diffuseness of the system's goals and participant's roles; (3) arrangements for instigating action; and (4) the establishment of effective personal relationships.¹ As a consequence, the bureaucratic system was infused with a set of relationships between superiors and subordinates which determined the direction of public policy.

Power was located at the top in the hands of the king. The king allocated power to trusted members of his retinue who supervised the actions of those below them. Thus, the bureaucracy only responded to orders from the top; little action was perpetrated at lower ranks. Oddly enough, not all orders were followed. Siffin stated "orders which changed abiding patterns of bureaucratic behavior were not effective when they conflicted with the diffuse and implicit arms of that behavior."² Conflict arose when orders threatened the status quo and the static nature of the bureaucracy. Apparently, not all the power resided with the king.

Changes in the bureaucracy began to occur after Thailand signed the Bowring Treaty in 1855. Western nations caused serious political and economic disruptions in the country in attempts to gain favorable trade agreements. At the same time, new ideas, technology, and outlooks made their way into the country. To insure its borders against encroachment

¹Ibid., pp. 30-31. ²Ibid., p. 37.

from neighboring colonial powers and to bolster a weak currency, the monarch instituted some basic fiscal and administrative reforms. Over time, government agencies were expanded to cover more specialized activities. King Chulalongkorn's major goal in reorganizing the bureaucracy was to create a comprehensive set of performance oriented administrative organizations.¹

An expanding bureaucracy required more civil servants than could be recruited from the royal family and elite though they continued to fill the top positions. Finding civil servants was really a minor problem. The ethnic Thai soon found they lacked a business sense which would allow them to compete with the Chinese merchants in the rice trade. The growing civil service proved to be an excellent alternative. The bureaucratic system provided security and mobility up the social ladder if an individual attached themselves to a promising patron. Entry into the bureaucracy, especially at higher levels, has been limited to ethnic Thai. Even today, a majority of college graduates seek employment in the civil service.

Modernizing the bureaucracy changed the functional role of the bureaucracy but not the social role. An hierarchical structures was the basis of the social system and the bureaucracy relied on its hierarchical system to define, control, and order relationships.² Other traditional features of the bureaucracy were individualism, paternalistic superiors, and authority residing with the king.

Three important consequences came out of this modernizing period (1855-1932). First, the bureaucratic organization could be classified as the emerging middle class without a sense of class identity.³ Second,

¹Ibid., p. 61. ²Ibid., p. 110. ³Ibid., p. 134.

little emphasis was placed on technical expertise or productivity.¹

Third, top level decision-makers have failed to obtain reliable information, because of poor (no feedback loops) or obstructed (status barriers) communication networks. These consequences suggest that the bureaucracy was more interested in protecting its own self-interest and securing its social position to be too concerned with project implementation.² Near the end of this period the bureaucracy also realized it could survive separately of the king.

After the overthrow of the absolute monarchy in 1932 the civilian bureaucracy, along with the military bureaucracy, shared in running political affairs. Though the military is the stronger of the two, it seldom has usurped key civilian bureaucratic positions for its own purposes. With all the changes (technical, economic, and political) that have occurred since World War II, the basic values of the bureaucracy have not changed. Bureaucratic behavior is still controlled by an hierarchical status, individualism, and a need to preserve the status quo (insures one's position in society). The only thing that has changed is the source of authority which is the real key to bureaucratic behavior. Even in the absence of the king's authority, hierarchical status and personal relationships within the elite provide the basis for legitimate authority.³

The major objectives of Thailand's bureaucracy is: (1) to make public policy decision-making as simply as possible; and (2) to provide employment

¹For a modern example of this, see Riggs, Thailand, pp. 342-43.

²This does not distract from impressive advancements in areas, such as irrigation development and public health which occurred during this same period.

³Because of the long traditional association between the civilian and military bureaucracies and the king, the king still maintains his position at the top of the hierarchy giving him some authority over public policy, decision-making if he opts to become involved.

opportunities for the growing number of college graduates in the country. Bureaucrats act rationally in attaining their goals and are aware of costs and benefits, usually their own, in pursuing selected goals. As the cost of a particular policy rises with respect to benefits, less effort (time and money) will be expended for that policy. Likewise, if the benefits of a policy increase in relation to costs, more effort will be expended in achieving that policy. Increased bureaucratic specialization and larger organizations has allowed the government to absorb a large number of the country's college graduates, though opportunities for employment are more limited now than in past years.

Each agency attempts to achieve its own goals which are to protect its own self-interest and, ironically, to avoid making hard decisions. Survival is very important to any agency. To insure survival, the agency attempts to build up a wide support base through clientele recruitment, that can bring political pressure on the government and woo influential political figures. Since it is difficult to build up popular support and sustained collective action in Thailand most agencies rely on their influence with the political elite, usually through the agency's top official. This is a precarious situation given the rapid turnover of political governments over the last few years. Riggs gives an example of an agency that was in existence one day and dissolved the next after a successful coup.

Thai's do not like to make decisions, especially if the issue is serious. Riggs states this characteristic in the following guiding principle of Thai bureaucracy:¹

As much as possible, reduce the work load for officials
Avoid the necessity of making hard decisions, of having to

¹Riggs, Thailand, p. 327.

choose between alternative which would necessarily alienate and antagonize other officials, especially those higher in the hierarchy.

Interdepartmental relations are affected by how decisions are made and how agencies are staffed and financed. If the department heads have strong personal relationships, various departments can have very good relationships with each other. Generally, there is a high level of competition between departments. Anthony Downs contributes organizational rivalry to functional and allocative competition.¹ Organizations attempt to stop others from duplicating their functions and receiving more financial support than themselves. Because financial resources are scarce in most developing countries, competition is particularly intense for any available funds.

An organization usually finds that the incorporation of as many functions as possible within its framework improves its chances for survival. Organizational growth becomes very important.² When an organization or a new agency undertakes functions already provided by another group, opposition should be expected. A new agency will have to fight strongly during its first years to avoid being disbanded or swallowed by an existing organization.³

Divisions within an organization are also very competitive as each division attempts to establish itself within the organization hierarchy. Each unit's objective is to gain the attention of the organization's leader. This usually is done through the personal relationships of unit

¹Anthony Downs, Inside Bureaucracy (Boston: Little, Brown and Company, 1967), p. 10.

²For a list of reasons organization officials will pursue a growth policy, see Downs, Inside Bureaucracy, pp. 17-18.

³Ibid., p. 10.

leaders and the organizational leader. Having influence with the organization's leader is important in obtaining finances and personnel. Continued conflict between unit leaders can seriously jeopardize the performance of the organization.

The characteristics of Thai bureaucracy suggest that cooperation and coordination between agencies seldom occurs. Many agencies tend to set up their own programs. Ingle reports on how the Accelerated Rural Development Department improved or replaced established socio-economic programs because the organization felt it would be less difficult and more productive to provide them directly than attempt to coordinate rural development activities.¹ This also allowed the department to expand quickly and influence the distribution of rural development resources. Being backed by a very powerful Prime Minister also helped in insuring the security of its existence.

As was pointed out in the last chapter, the successful implementation of the land reform program depends on the cooperation and coordination of several government departments. Given the above description of Thai bureaucracy, what type of obstacles will the ALRO face in reaching its objectives? By looking at the functional and social relationships between the ALRO and other departments, potential problem areas can be identified.

The basic comprehensive development plan has been drawn from plans of successful land settlement programs. In undertaking land settlement activities, the ALRO duplicates the functions of several other departments (see Chapter II). A few of these departments have been very successful in these activities gaining influence and power with the political

¹Ingle, Local Governance, p. 44.

elite. They are very sensitive about other departments infrining on their activities. Though they do not oppose the idea of land reform, they oppose the land settlement activities which threaten their existence. This attitude is a subtle, yet, formidable barrier because it affects interdepartmental cooperation.

One powerful department, the Land Department, has been able to retain the important function of processing and granting title deeds to all land within the country. This function is the cornerstone to any effective land reform program and the ALRO does not have control over its procedures. Since a large percentage of the land being reformed is in the public domain, being able to grant deeds would speed up the improvement of rights associated with agricultural lands. Other departments have also been able to protect their self-interest by retaining certain functions they covet, jeopardizing the entire land reform program.

In the allocation of monetary and staff resources, the ALRO has received generous financial but little staff support from the government at the expense of other programs. Jealous departments, especially those whose budgets were cut, have not contributed required staff support to carry out the necessary ALRO functions. If other agencies have contributed personnel, it has only been for short periods or after completion of other expected duties. In some cases, this personnel is of very limited talent. This hurts the ALRO which has had to rely on temporary employees who are inexperienced in the nature and scope of land reform.¹

¹From late 1975 through 1976 the ALRO could not recruit new personnel who had passed the civil service examination. Each department is responsible to prepare its own examination for the civil service. It took the ALRO over a year to have their examination approved by the Civil Service Commission. During that time, the office lost a number of good personnel to other agencies with acceptable exams. Since the ALRO does not have a lot of influence, qualified civil service candidates are hesitant to work

Unlike the Accelerated Rural Development Department, the ALRO has not enjoyed strong political support during its infancy. Repeated changes in the government since its conception has kept the ALRO from becoming entrenched in the bureaucracy and has left it vulnerable to those who oppose its functional objectives. Strong relationships only exist with departments whose leaders are close personal friends of the Secretary-General of the ALRO.¹ As a result, the ALRO has relied on its technical skill and publically supported mandates to accomplish its goal. In a bureaucratic policy where technical skill plays second fiddle to influence,² the ALRO is not in a good position to complete its required assignments.

Internal relationships between divisions in the ALRO are also a source of conflict. When the ALRO was established, there was no clear cut hierarchical arrangement. During its first year, different divisions jockeyed for top position in the hierarchy and influence with the Secretary-General. The result was a lot of bickering, poor communication, work duplication, and lack of cooperation. As relationships between various administrators became defined, better working conditions have emerged.

The ALRO faces serious bureaucratic obstacles in attempting to implement the land reform program. These obstacles are a general reflection of the existing characteristics of the Thai bureaucratic system. Rigg's

for the ALRO where the prospects of high social mobility are low and the long-term survival of the office is questionable.

¹The untimely death of Secretary-General Chaityong Chuchart placed the ALRO in a delicate situation. All the influence behind the land reform program resulted from Dr. Chaityong's personal relationships with the political establishment and the bureaucracy. Under new leadership, the ALRO may not be able to sustain these relationships.

²Riggs, Thailand, p. 339.

four norms of the bureaucratic action, avoidance of making hard decision, provision of services rather than using regulations (which cannot be enforced), collection of money to finance operations (only from those who cannot create problems), and generation of as much influence as possible, seem to closely describe the ALRO.¹ Even though the ALRO seems prepared to provide services to its clientele and collect payments in return for investments made in the participant's behalf, they have not been able to garner enough influence and power to ensure that their programs will be implemented.

William Siffin summed up the Thai bureaucracy appropriately when he said it did more than implement public policy, it represented a social system which:²

May hold society together, reflect its cultural foundations, nurture and support various forces within it, define and assert and enforce important social goals, and greatly affect the ability of a given social system to survive and change.

Landlords

The last set of actors to be identified as involved in the implementation process is the landlords who may have their lands expropriated and redistributed to tenants and landless farmers. From the discussion on the land reform act, absentee landlords appeared to be the main target of the reform program. Unfortunately, identifying exactly who these absentee landlords are is not as simple as pointing an accusing finger at them. The complicated titling procedure and power and influence have aided in keeping their identities hidden. Educated guesses suggest that absentee landlords are wealthy bureaucrats, military leaders, or tradesmen.

¹Riggs, Thailand, p. 327.

²Siffin, The Thai Bureaucracy, p. 1.

While these guesses cannot be verified, historical references to generous land grants for loyal service to king and country, grants for rural development projects, and recent land market activities would strongly support the contention that many absentee landlords can be found within the country's elite.

If land reform should proceed to a point where these lands would be expropriated, serious opposition should be expected. Given the country's recent unstable political environment, influential absentee landlords can mount considerable pressure on politicians to slow down the land reform program. Since some are in key bureaucratic positions, expropriation can be blocked by undermining the implementation process. To date, this group has not been visible, probably because current land reform activities are centered on public and Crown land. Opposition will become more open, if these activities are expanded onto private lands.

Summary

In the society of Thailand, there are a number of institutions interacting at all levels of society. All these institutions share some common characteristics. First is the individualistic behavior of all members of society. This behavior is supported by religious tradition and sustained by bureaucratic arrangements. Second, all institutions are highly structured, hierarchical systems based on prescribed superior-subordinate or patron-client relationships. Status is very important and is reflected in the high degree of social mobility found within the country. Coinciding with this characteristic is the paternalistic attitude of superiors to subordinates. Hierarchical arrangements and paternalism give the country stability and order.

These characteristics determine how certain institutions will react to various stimuli. Except for the monarchy and possibly the military, the other institutions may react negatively to the implementation of the land reform program. Some obstacles can be surmounted; but without political support and participation at the project level, many of the obstacles cannot be overcome. Political instability, five government changes since land reform was enacted, probably is the most serious threat to the ALRO. This impairs the ALRO's relationship within the bureaucracy because it has little influence to use to extend its position within the hierarchy.

From this short summary of the social-cultural-political institutions, it appears that the ALRO faces some serious functional and social problems in implementing land reform. If these obstacles were not enough, weaknesses in the agricultural infrastructure further complicate the situation.

Agricultural Infrastructure

One of the biggest obstacles to the successful implementation of land reform is the inability of the implementing agency to provide or effectively coordinate the necessary support services, e.g., credit, cooperatives, marketing, extension, etc.,¹ which are needed to maintain a vigorous and healthy agricultural environment. This problem also received attention in the United Nations fifth report on land reform which stated:²

. . . the problem has been one not only of too many specialized agencies at national level, but also the

¹Lin, Land Reform, p. 56.

²United Nations, Progress in Land Reform, Fifth Report (New York: United Nations, 1970), pp. 206-07 as cited by Lin, Land Reform, p. 56.

inability to coordinate their services at farm level so as to ensure that the farmer gets an integrated "package" of services. Most programmes have broken down at this level.

Agricultural support services in Thailand have traditioanlly been weak,¹ especially credit extension and marketing institutions. Since the ALRO plans to provide all necessary support services to project participants through cooperatives, it would be helpful to briefly review the problems currently surrounding these institutions. Identifying recurring problems should aid the ALRO in overcoming them.

Credit

The lack of capital in rural areas is a major complaint of many farmers. For the farmer, the lack of capital hinders production because new inputs, such as, seeds, fertilizers, and insecticides, cannot be obtained. Even cooperatives are limited by law to loan no more than 7,000 Baht for annual production purposes. For a rice farmer 7,000 Baht may be more than sufficient to meet expenses, but for the cotton farmer 7,000 Baht falls far short of input costs considering that he must spray with insecticides 15 times during the growing season.

Improvement in the availability of farm credit will have to come from both institutional, e.g., banks and cooperatives, and noninstitutional, e.g., moneylenders, family, and merchants, sources. Until recently, institutional sources have played a very minor role in the credit structure. The World Bank reports in Thailand only 7 percent of the farmers receive credit from institutional sources and that public and private institutions distribute only 8 percent (7 percent public and one percent

¹See Philip Judd, "Irrigated Agriculture in the Central Plains of Thailand," in Studies of Contemporary Thailand, ed. by Ho and Chapman, pp. 168-69; Sternstein, Thailand, pp. 148-155; and Ingram, Economic Change, p. 275.

private) of the agricultural loans.¹ Most of the rural credit needs is supplied by private sources, particularly, relatives and friends, landowners, and merchants.

After the elections in 1975, the government set out to improve rural credit. One policy directive requested that the commercial banks allocate loans to farmers equivalent to 5 percent of each bank's previous years loan portfolio. In 1976, a newly elected government changed the policy slightly requiring that banks, loan a total of 7 percent of the deposits on hand, as of December 1975, to the farmer. For some banks this meant loans to agricultural sectors increased 8,000 percent.²

On paper the money amount was large. In 1975, the loan total was over 3,500 million Baht and in 1976, loans were projected to almost double, some 6,000 million Baht. Getting this money into the hands of the farmer was another story. The commercial banks were faced with a huge administrative problem. First, most banks did not have credit personnel with any experience in evaluating loans in the farm sector. Second, the banks were understaffed to process and supervise the administration of such large loan funds. Thirdly, the banks did not have the necessary contacts among farmers to find outlets for the loans. The banks followed two courses of action: (1) most of the loanable funds were shifted to the government-run BAAC (Bank for Agriculture and Agricultural Cooperatives); and (2) rewrote or rearranged credit agreements with agricultural middlemen and part-time farmers, as agricultural loans.

The real pressure is now on the BAAC to get credit to the farmer. The BAAC has had a difficult time assimilating the large amount of money

¹World Bank, Agricultural Credit, Sector Policy Paper (Washington, D.C.: World Bank, 1975), pp. 70-71.

²Chusak Himathongkom, Financing of Agricultural and Agro-Based Industry (Bangkok: Bangkok Bank, Ltd., 1976).

transferred from the commercial banks. Short on manpower, the BAAC is having trouble administering loans and, as a consequence, is facing a mounting problem of bad debts and delinquency, greatly overextending their financial position.

The author talked with officials at the BAAC. They seem very optimistic about working out their administrative problems. Further, they feel that the BAAC can meet the credit needs of all farmers if the farmer applies in the appropriate manner. The potential borrower must fill out an application stating the amount of loan desired and purpose(s) to which the money will be used. Generally, a cooperative will fill out an application for all its members receiving a lump sum loan which is later divided among the members. Individual farmers can also apply, but for many it is difficult either because they cannot read or write or are located too far from a BAAC office to take the time to apply for a loan. The BAAC still has a lot of work to do in reaching more farmers than the mere 7 percent reached only a few years ago.¹

Most farmers, seeking short term loans, will have to continue to rely on noninstitutional sources. Primarily this will be relatives, but other sources are also tapped. One myth of the agricultural sector which needs to be refuted is the role of the middleman as a source of credit. Ammar Siamwalla contends that a middleman will only lend money if he controls the terms of trade like in the sugarcane industry. In

¹In talks with Dr. Virach Arromdee of the BAAC, it seems the bank is not having any problems meeting the requests for long term loans. Problems arise in handling short term production loans. Clearly, the bank favored giving loans to well established, relatively risk free farmers, while hesitating to give loans to those who needed them--tenants and poor farmers. Even cooperatives were not receiving enough financial support from the BAAC to meet their demands. Dr. Arromdee admitted that the bank was having difficulty in administering its short term loan program.

the very competitive rice, maize, and cassava markets where sellers can look around, middlemen will not lend money.¹ Following this line of reasoning, the author, in discussions with rice farmers, has found that the middleman is seldom used as a source of credit.

Farmers still face a problem of finding needed capital.² As agricultural development projects continue to expand, more and more credit will be necessary to meet the rising demand. With sufficient financing, farmers can increase production leading to further improvements in the rural sector.³ Without funds, farmers will be forced to stick to more traditional, less intensive methods of agriculture and will borrow from sources which demand such high interest that the rural sector will sink further into indebtedness.

Extension

Agricultural research is conducted at a number of experiment stations throughout the country and at various universities, primarily Kesetsart and Khon Kaen Universities. Overall, the program has been referred to as "inadequately focused on regional production problems and uncoordinated."⁴ Though successful experiments have been conducted at regional research

¹See Ammar Siamwalla, "Farmer and Middlemen: Aspects of Agricultural Marketing in Thailand" (unpublished manuscript, Thammasat University, n.d.), n.p.

²Some people feel that most of the credit goes for personal consumption. In a recent talk with farmers in Chachoensao, they were strongly emphatic about their purposes: better irrigation, fertilizer, new seeds, and small tractors.

³Alek Rozental argues that improved farm credit will improve production and increase income and savings, see Finance and Development in Thailand (New York: Praeger, 1970).

⁴Junius W. Robins, "Thailand Northern Small-Scale Irrigation Proposals: Report of Identification Mission" (unpublished manuscript, Bangkok: World Bank, 1975).

farms, there are long delays in transferring these findings to local farmers; if transference does occur, it is seldom accompanied by any supervision.

The extension service is under some serious handicaps. Controlled by a centralized agency in Bangkok, the local agents have little freedom in attacking local problems, but must pursue programs established in Bangkok. There are too few extension agents to handle all the work required of them.¹ Some farmers never see an extension agent, while others may receive visits several times a month. Extension workers also receive very low salaries, relative to other agricultural personnel, which dampens any enthusiasm for working hard.²

Much of the success of an area's extension program depends on the individual agent's enthusiasm for solving rural problems. Too often extension agents are very frustrated because they do not have the training they need to handle the wide-range of problems they face.

Blame cannot be put on the man in the field. The central government has long neglected the extension service. Farmers are being asked to try new methods and new crops. Most are willing to try, but feel very insecure, because they lack knowledge on what they are doing. An aggressive extension program can help to reduce the uncertainties farmers face which will improve the chances of reaching and maintaining higher production levels.

¹Pradit Machima reports that the ratio of agricultural extension workers to farm families in Thailand is 1:5,000. This does not compare favorably with Japan, 1:540 or Taiwan, 1:1,500. See Pradit Machima, "Long Term Agricultural Development Programme through Agricultural Co-operatives and Technical Assistance in Thailand," in Growth and Development of Agricultural Cooperatives in Thailand, ed. by Pradit Machima, (Bangkok: Cooperative League of Thailand, 1976), p. 3.

²This point was emphasized by Bill Blackwell of the Adams International Tobacco Company during a visit to the company's processing plant near Khon Kaen.

An urgent need for farmer training programs exist. A successful example of what can be done can be found at the Prabuddabad Land Settlement in Salaburi. Here, an enthusiastic program has been established to teach farmers and their families how to use new farm machinery, raise new breeds of animals, and cultivate new types of crops. This program can serve as a model for other centers which can be set up in other areas.

Marketing

The government plays a very small role in the internal marketing of agricultural products. For most agricultural commodities, there is a very competitive market involving private enterprise. Actually, each commodity has its own marketing structure depending on its unique characteristics.¹ In general, the marketing system does not reflect abnormally high profits and remains competitive for rice, maize, cassava, and rubber.² The point of this section is not to argue whether the market system is efficient, or corrupt. On the whole, the farmer has few complaints about activities of the middleman. The question which needs to be addressed is the role of the government in improving the position of the farmer within the marketing system.³

The major complaint of cooperative managers is the lack of marketing information to plan the next cropping pattern. Without information farmers will not change crops. If a crop of mung beans sold well last

¹Siamwalla, Farmers and Middlemen, n.p.

²Ibid.

³For a thorough review of the marketing institution see Peter Pollak, "Economic Analysis of Oilseed Markets in Thailand" (unpublished Ph.D. dissertation, University of Minnesota, 1974), Chapter 2.

year, a farmer will plant beans again not knowing the world price was dropping or trade agreements were being renegotiated. Dire consequences result as farmers and cooperatives lose major portions of their investment. The government must take a more active role in transmitting price signals to the farmers. This is logical since many of Thailand's agricultural products are traded internationally and the government negotiates and monitors all trade agreements and world commodity prices.

Another marketing problem is the poor quality of farm products. Lack of adequate storage facilities and proper handling techniques decreases the quality of the produce that can be marketed. As a result, the farmer receives a lower price in the market. He also may not have been able to borrow enough capital to meet next season's production costs because many banks discount potential output due to its uncertain quality. Work needs to be done to improve the quality of output not necessarily through new seeds, but through better practices from the time of harvesting until the milling process. Government officials and local cooperatives working together can improve product quality by improving storage facilities and enforcing quality control measures.

Cooperatives

Over time the cooperative movement has become the backbone of agricultural development policy. Government policy has been oriented to strengthen and expand the cooperative system in hopes that agricultural output will increase, quality of produce will improve, and rural income will rise and indebtedness will fall. Originally, the cooperatives were established to do one thing--provide credit. Today, the cooperative's primary function is still providing credit though, in theory, cooperatives can provide a wide range of services.

Generally, a cooperative can operate in three broad areas: finance, service, and marketing. Financing deals specifically with extending credit to cooperative members. Service activities center on providing needed inputs, such as, fertilizers, pesticides, and tractor for hire. Additional services provided to the farmer could include extension and educational programs to improve the farmer's managerial capabilities. The cooperative can also act as a marketing agent selling members' produce directly in the Bangkok market.

Several self-help settlements have been successful in providing support in all three areas. Most cooperatives have not been able to expand out of the traditional role of extending credit. Mr. Prawat Chatikananitch of the Department of Cooperatives told the author that the major reason most cooperatives could not expand activities was the lack of capital to initiate new programs. In discussions with project officials in some land settlements, this reason was verified. Officials were disappointed because money was not available to provide more services nor to hire capable managers to run the cooperatives.

How many farmers are members of cooperatives? In 1975 there were 578 registered agricultural cooperatives composed of 390,877 farm families.¹ In 1968, there were 2,766,950 rice farming families throughout the country.² These figures give a rough indication that only 14 percent of the farm families are in cooperatives. This assumes that the nearly 400,000 families in cooperatives are all rice farmers and there has not

¹Pradit Machima, "Agricultural Cooperatives in Thailand," in Growth and Development, p. 4.

²The Office of National Statistics, as cited by Under-Secretary of State Adul Niyomwipat, (unpublished research paper, Bangkok: Ministry of Agriculture and Cooperatives, 1972), in Thai.

been a big change in the number of rice farming families over the seven years between 1968 and 1975 (also the definition of a rice farmer is ambiguous, a farmer with 40 rai of sugarcane and five of rice could be considered a rice farmer). There is no way to include in the estimate the number of families in farmer associations. Regardless, the cooperative system reaches a relatively small group of farmers.

The ALRO is relying heavily on cooperatives to provide credit inputs and marketing outlets for the farmers involved in land reform projects. It is important that these cooperatives be well organized to avoid the problems which usually hound newly formed cooperatives. Pradit lists several common problems all new cooperatives face:¹

1. Lack of sufficient funds. So far cooperatives have only been able to supply a member with about 50 percent of the credit he needs.
2. The absence of a central financing agency to help cooperatives with money matters.
3. Poor education of farmers. Though farmers are economic men, they lack education in new farming methods.
4. Inability to attract good managers to run cooperatives.
5. Lack of better understanding of cooperative principles and technical information among the members.

Cooperatives can offer support to any agrarian reform program. Like the reform program the cooperative system needs to be well planned. In some areas, cooperatives are off to a good start. These cooperatives should serve as a model on which an enthusiastic expansion program can be based.

¹Pradit Machima, "Long Term Development," in Growth and Development, pp. 7-8.

Infrastructure Problems: A Review

While this review of Thailand's agricultural infrastructure has not been comprehensive, it does highlight several of the problems the ALRO will have to overcome in providing the necessary support services to project participants. First, it is clear that the limited availability of capital has been a serious problem in rural areas. Despite government efforts to correct this situation by expanding the money supply to be used for agricultural loans, because of poor administration and lack of outlet facilities (means to distribute loans to farmers) current attempts have not been successful. Second, the country's extension program has not been able to effectively transfer research knowledge to the farm nor been able to encourage farms to become actively involved in new farming programs. Failures in the extension service can be attributed to several factors, including: inadequate staff, poor pay, and an inflexible program controlled by centralized decision-makers in Bangkok. Third, even though the marketing system for many crops has been found to be very competitive, farmers are at a disadvantage because they lack enough information to make proper production decisions or do not have the proper storage facilities and transport to insure product quality. Part of the problem stems from the inability or unwillingness of government agencies to disseminate relevant price information from international trade agreements. In some cases, trade negotiations have been concluded after the farmers have had to make planting decisions. Attempts have been made to improve product quality by expanding transport systems, especially highways, and constructing storage facilities. These improvements do not affect every farmer; suggesting that further efforts should be made to improve product quality.

One institution which is slowly overcoming these problems is the cooperative. Originally organized as a means to secure low interest loans, farmers are becoming aware of the other functions a cooperative can perform. Several cooperatives started by the Land Settlement Division have been successful in providing a number of services to its members. It must be remembered that success took a long time materializing and the program was under the constant supervision of German advisors. Though the success of these cooperatives is a hopeful sign, correcting the shortcomings of the agricultural infrastructure is a slow process, something that will not be done overnight.

Summary

This chapter emphasizes several key points. First, it indicates that the social, cultural, and political institutions are important determinants to the implementation of land reform. Second, it appears they have not received adequate attention as to the role they play in the implementation process. In some cases, these institutions will assist the implementation process, e.g., the support of the monarchy. Much of the time they will form obstacles to the implementation process. The most formidable obstacles will be put up by various departments within the bureaucracy that are attempting to protect their own self interest.

Even if the land reform program is implemented successfully, the ALRO faces further problems from a weak agricultural infrastructure. The long term success of land reform depends on the ability of support services to provide key functions at the right time. It appears that the various agricultural institutions need to be reorganized and strengthened in order to meet the demands placed upon them. To date, cooperatives

have been the one bright spot within the agricultural infrastructure. Continued support of cooperatives may improve the situation, but it should be kept in mind that success requires time and constant supervision.

CHAPTER IV

METHODOLOGY

Public investment decisions usually call for careful analysis and examination of alternative courses of action. Various approaches can be used in the conduct of these necessary examinations. Current options include benefit-cost analysis, program analysis, cost-utility analysis, cost-effectiveness analysis, systems analysis, and cost-recovery analysis. Generally speaking, all these methods are similar although definitional differences exist between them. Like the other approaches, cost-recovery analysis looks for a relationship or set of relationships between the estimated benefits and expected costs associated with particular courses of action. The analytical process provides a worthwhile function in that it provides a guide to the constructive management and use of public funds.

Cost-recovery analysis focuses on the central issue of whether or not projects can produce sufficient benefits to more than repay their costs. As a management technique, cost-recovery analysis can be used to compare the economic potential of alternative projects.¹ Most often, however, it is used to justify projects that already have been or are about to be undertaken. Cost-recovery operates in a time frame which extends into the distant future, i.e., 20 or 30 years. In dealing with such

¹In areas where different levels of irrigation technology and sophistication can be developed, cost-recovery can very well serve as a method in deciding which irrigation development project should be undertaken, especially if there will be an attempt to recover project investment costs.

long time horizons, one must cope with many uncertainties. Expected interactions are often not definable or are not understood clearly or are subject to rapid changes. Definite constraints on effective analysis and planning also are posed by the uncertain political atmosphere for land reform, deficiencies in technological information, and resource limitations.

Cost-recovery deals with investment decision problems and with the need for weighing expected benefits against expected costs. Considerations involving intangible values or costs may dictate different lines of action than those suggested by cost-recovery analysis, but the analysis can still play a meritorious role in helping to sharpen the intuition and judgment of decision-makers.¹

Literature Review

The principles of cost-recovery are relatively new and have not as yet received discussion in the literature. Most of the current emphasis on cost-recovery stems from activities of the World Bank or groups working with the bank. Bank policy requires that all requests for loans involving irrigation development be accompanied by a cost-recovery report. Similar types of analysis can be found in investment recoupment periods in centrally planned economies and cost sharing arrangements in the European communities and the United States.

Cost-recovery analysis has a parallel in the use of "pay out periods" as a means of project evaluation in centrally planned economies. Where there is no functional rate of interest to be used in estimates of the

¹Gene H. Fisher, "The Role of Cost-Utility Analysis in Program Budgeting," in Program Budgeting, Program Analysis and the Federal Government, ed. by David Novick (Cambridge, Mass.: Harvard University Press, 1965), pp. 67-78. This article also outlines the characteristics of cost-utility analysis, some which have been adapted in the preceeding paragraphs.

marginal cost of capital, cost-utility or payout periods provide an essential alternative analytical tool for project evaluation. In calculating the efficiency of capital investment, the basic criterion is:

$$C = \text{minimum}$$

where C represents the annual operating costs, including depreciation.¹

A common method in evaluating alternative projects is the coefficient of relative effectiveness (CRE).² By taking the reciprocal of the coefficient, the repayment period can be determined.

The formula for CRE is given by:

$$n = \frac{C^b - C^a}{K^a - K^b}$$

where K^a and K^b are the capital investments for two projects, and C^b and C^a are the annual operating costs of the respective projects. N represents the efficiency of an investment or the savings in operating expenses obtained from each additional unit of capital investment.

To determine the period of recoupment the formula is inverted:

$$\frac{1}{n} = \frac{K^a - K^b}{C^b - C^a} = t$$

where t represents the time required to recover an additional unit of capital invested in a project. By comparing the periods of recoupment, an analyst is actually comparing project efficiency, e.g., if $t = 5$ years, then project efficiency is 20 percent.³

According to Bergson, alternative projects are subject to two tests to decide on which course of action to follow. The first test simply

¹Abram Bergson, The Economics of Soviet Planning (New Haven: Yale University Press, 1964), p. 253. Symbols have been slightly changed in an attempt to be consistent with other references.

²Ibid.

³L. V. Kantorovich, The Best Use of Economic Resources (Cambridge: Harvard University Press, 1965), p. 169.

compares n or $1/t$ to a standard N determined by the government:

$$n \gtrless N$$

if n is greater than N , project a is selected and, if n is less than N , project b is selected. In the second test, all costs are considered and preference is given to the project with the lowest cost:¹

$$C^a + NK^a \quad C^b + NK^b.$$

Bergson's intention is to show that interest rates are implicitly implied in central planned economies according to the following efficiency rule:

$$\frac{C}{K} = i + \frac{i}{(1+i)^g - 1}$$

where i is the interest rate and $\frac{i}{(1+i)^g - 1}$ represents the annuity which, when compounded at rate i , will accumulate after g years.² The annuity is equal to an amount which will replace the original unit of capital investment.

There are several shortcomings to this method. First, it is not appropriate for short time periods because efficiency can change over time. Second, K refers only to additional units of investments and not basic "sunk" investments. Third, N is determined politically not objectively and varies depending on the particular situation. Fourth, costs and investments are valued in current prices not reflecting actual economic expenditures. Fifth, the efficiency rule can be easily violated, especially when clearing prices can not be established.³

¹Bergson, Soviet Planning, p. 254.

²Ibid., p. 257.

³See Kantorovich, Economic Resources, p. 170 and Bergson, Soviet Planning, pp. 257-65.

Another example of cost-recovery can be found in the European communities. Realizing that the returns to agriculture would not be enough to finance improvements in the agricultural structure and desiring increased production, the community established a fund to guide agricultural development (part of the Agricultural Guidance and Guarantee Fund).¹ Once a project has been approved by the standing committee on Agricultural Structures, subsidies are granted from the fund not to exceed 25 percent of total investment costs. Project beneficiaries are expected to provide at least 30 percent of the investment costs.² The remaining balance, approximately 45 percent, is contributed by the nation in which the project is located.

These guidelines have been modified, e.g., in 1978 the fund covered 50 percent of the costs for public irrigation facilities in Mezzogiorno, Italy.³ (Water development projects accounted for 31 percent of the development funds dispersed by the community followed by the wine sector with 12 percent.⁴) Member states are relying more on the community to help finance projects as national budgets have been tightened reducing funds to agriculture.⁵

At present, it is not possible to determine the actual percentage of investment funds contributed by project beneficiaries. Typically, one would expect cost-sharing arrangements for land consolidation in the European community to be divided in the following manner: 60-70 percent

¹European Communities, Official Journal of the European Communities, Special Edition (Nov. 1972), p. 104.

²Ibid., p. 109.

³European Communities, The Agricultural Situation in the Community: 1978 Report (Brussels: European Communities, 1979), p. 135.

⁴Ibid. ⁵Ibid., pp. 139-41.

of all costs funded by the national government and the guidance fund and 30-504 percent by project beneficiaries.

Early U.S. irrigation policy encouraged private development of dry lands, by making tracts available at nominal cost or by homesteading regardless of the occupant's ability to effectively utilize the land. Additional attempts were made to involve state governments in irrigation development. Many of these early private and state ventures ran into difficulty and were abandoned. An active federal reclamation program was initiated by Theodore Roosevelt whereby the federal government would plan and finance irrigation projects. This effort resulted in the passage of the Reclamation Act of 1902 which would significantly affect the agricultural development of the western U.S.¹

Under the act, beneficiaries were required to pay for the construction of dams, ditches, and other necessary facilities. Interest was not charged, unless payments were late. Poor irrigation planning, coupled with rising costs, made it difficult for farmers to meet their payments. To relieve some of the burden on beneficiaries, a bill extending the repayment period from 10 years to 20 years, allowing smaller yearly payments, was passed in 1913. The Depression caused further financial problems, which were ameliorated by amending the 1913 bill. In 1925, only 10 percent of construction costs had been repaid while beneficiaries had defaulted on 14 percent of construction costs and 17 percent of operation and maintenance charges,² even with the extensions. In 1926, the repayment period

¹For an excellent history of irrigation development in the U.S., see Paul W. Gates, History of Public Land Law Development (Washington D.C.: Public Land Law Review Commission, 1968), Ch. XXII.

²Gates, Land Law Development, p. 675.

was extended to 40 years, but required six percent interest on delayed payments. Repayment provisions were further liberalized extending repayments in some cases to over 70 years. Income received from hydropower was used to defray some of the construction costs.¹ Nevertheless, project beneficiaries were ultimately responsible for covering the remaining costs of irrigation facilities.

Today, a wide variety of land and water development projects have been implemented, requiring funding from different sources. In 1975, the Water Resources Council (WRC) prepared a report on various options related to cost-sharing for federally sponsored programs.² Besides simply considering construction and operations, maintenance and replacement costs, other factors are included in determining cost shares. These factors included interest rates, length of repayment period, grace period before first payment, revenues which defray costs, and value of assets given to complete a project, e.g., land or easements.³ For projects providing hydropower, municipal water supply, and irrigation, users are expected to pay the full costs.

In the WRC's report, several examples of equalizing repayment schedules are presented to illustrate a sense of equity among project beneficiaries.⁴ A common method is a user transfer which transfers cost

¹Ibid., p. 678.

²Water Resources Council, Planning and Cost Sharing Policy Options for Water and Related Land Programs (8 parts; Washington D.C.: Government Printing Office, 1975).

³Water Resources Council, "Options for Cost Sharing: Implementation and OM & R Cost-Sharing for Federal and Federally Assisted Water and Related Land Programs," Part 5A in Planning and Cost-Sharing, p. 7.

⁴Ibid., p. 14. This part of the report is an excellent review of the various approaches used by the WRC in formulating its cost-sharing procedures.

repaid among various users, e.g., from hydropower to irrigators. Surplus revenues from other sources can be used to defray the costs to some users. For irrigation projects, the federal government does actually cover part of the allocated costs--approximately 10 percent.¹ The remaining balance is covered by non-federal sources, primarily the private individual, though some local governments do contribute funds to irrigation programs.

Repayment periods are generous extending 50 years from the date of project completion, at an average six percent interest rate. For selected projects, participants do not have to pay any interest charges if costs are recovered in 40 years. All operation and maintenance costs are paid by the participants. Finally, payments are based on the individual user's ability to pay.²

World Bank loan agreements for irrigation projects contain provisions for the collection of fees for current operation and maintenance costs and partial recovery of capital investments. An example of these provisions is presented by Wapenhans:³

The Borrower shall make suitable arrangements for the recovery by means of charges for the use of irrigation water and by means of increased taxes on land in the Project Area, of all operating and maintenance costs and of as much as practicable of the monies invested in the Project together with reasonable interest thereon. (500-MA, Excerpt from Section 5.09 of Loan Agreement, dated June 15, 1967.)

In practice the bank is concerned with three types of costs: resource utilization costs, O & M costs, and investment costs. Priority is given

¹Ibid., p. 63. Costs covered by the government are project design and preparation costs, incurred prior to project implementation.

²Ibid., Table 5B-1-2. This table reviews all water programs and the corresponding cost-sharing roles and rates for non-federal participants.

³W. A. Wapenhans, 'Note on Pricing of Irrigation Water' (unpublished report; Washington D.C.: World Bank, 1969), p. 10.

to the collection of fees to cover the first two costs while a wide degree of flexibility is apparent in handling recovery of investments.

Wapenhans' "Note on Pricing of Irrigation Water" is one of the first attempts to formalize bank policy on cost-recovery. In this report two basic policy goals are examined. First is the recovery of O & M costs through land taxes. Using a land tax approach suggests that a "substantial portion of the benefits generated by an irrigation project may not accrue to the users,"¹ because of land tenure arrangements which favor absentee landlords. Instead of benefits flowing to labor, management, or capital, landowners capture a large share of the benefits. A land tax captures some of these benefits not associated with the user.²

Second, increasing emphasis has been given to efficiency pricing of water, to encourage proper usage of water resources. Farmers tend to have preconceived notions about water use that are not compatible with irrigation practices. Water charges serve as an incentive to change farmers' behavior and to insure higher productivity. This approach is slightly myopic, since other factors affect efficiency, such as, proper maintenance of the irrigation system, availability of other agricultural inputs, ability to properly monitor water usage, farm gate price, and effective irrigation designs. Water charges out-of-line with these other factors may cause a negative reaction among farmers.

Cost-recovery policy was further elaborated upon by Ray in 1975. His basic approach was that an appropriate cost-recovery policy depended

¹Ibid., p. 4.

²Under certain conditions the land tax can be passed on to the users in the form of higher land rent or changes in share cropping arrangements. To protect users who are tenants, enforceable rent controls would seem to be an appropriate solution.

on the level and structure of the prices for outputs from a project (efficiency pricing) and the desirability of adjusting efficiency prices to accommodate certain fiscal or equity concerns.¹ Essentially, this approach is concerned with pricing policy of water which will influence its' use and the allocation of project benefits. Any deviations from efficiency prices should only occur after careful consideration of all possible consequences.² In other words, trade-offs may be made whereby all investment costs may not be fully recovered. On the other hand, efficiency pricing could lead to recovery of more than the original investment costs.

Ray, dispelling the notion that cost-recovery is strictly tied to the costs related to the project, takes a broader approach which incorporates income distribution effects and overall national revenue and expenditure patterns. Besides pricing water, other types of "discriminatory" taxes³ on project beneficiaries are advocated if efficiency and equity norms are not violated. For irrigation projects, fiscal and distributional patterns are very important since efficiency pricing is difficult to arrange and enforce and pertains to ensuring participation in the project.⁴

This approach represents a shift in thinking within the bank, but cost-recovery remains an integral part of the economic analysis of projects. The results provide decision-makers with a wider variety of possible courses of action.

These views on cost-recovery policy suggest that no distinctive framework has been developed to analyze the existing cost-recovery

¹Anandarup Ray, Cost Recovery Policies for Public Sector Projects, Bank Staff Working Paper No. 206 (Washington D.C.: World Bank, 1975), p. 1.

²Ibid., p. 2. ³Ibid., p. 4. ⁴Ibid. p. 7.

situation and to outline the procedures for capturing funds to cover the various cost items. Several reasons are behind this: first, there is relatively little theory directly addressing cost-recovery; second, public goals often conflict, i.e., improving income and recovering costs; and third, existing cost-recovery practices focus on measuring inputs rather than examining the outputs and their impacts.

Situations for cost-recovery vary among projects and between countries. Official procedures for cost-recovery do not exist in Thailand though several approaches have been presented to the government. The Department of Agricultural Economics (DAE) has developed a linear programming model for appraising land consolidation projects in the upper Chao Phraya River basin. Under this procedure, costs are recaptured from the benefits derived from the project. ILACO, a Dutch consulting firm which has designed and provided technical advice on selected irrigation projects, has developed a slightly different approach to cost-recovery. Its analysis assesses the net benefits of the project and allocates them between the different factors of production. The World Bank's approach has not been officially adopted in Thailand; yet, it has had some impact on the development of alternative approaches.

Underlying the various approaches to cost-recovery are basic land economic principles relating to rental arrangements and resource development investments. These principles may provide the needed theoretical framework within which an effective cost-recovery policy can be developed. The remainder of this chapter is devoted to briefly reviewing the relevant principles of land economics, discussing in detail the alternative approaches to cost-recovery (World Bank's, DAE's, and ILACO's methods), and outlining the cost-recovery approach adopted for this analysis.

Basic Land Economic Theory

Land economic theory provides some insights into what influences resource allocation and development through the examination of the social, economic, and physical factors surrounding the resource in question. The underlying principle of land economics is the concept of land rent. Once this concept is understood, other aspects of land resource use can be analyzed. In this section, the concept of land rent will be developed as well as its application to rental arrangements and resource development decisions. It is in the explanation of rental arrangements and resource investment that the theoretical concepts become useful tools in policy analysis.

Land Rent

Land rent is useful in theoretical explanations of the value of land resources, the allocation of land resources between different uses, the incentives for ownership and the policies of development and conservation.¹ The term, land rent, refers to the "economic return that accrues or should accrue to land for its use in production."² It involves a combination of ground rents (long-term leasing arrangements), man-made improvements, and location and fertility factors.

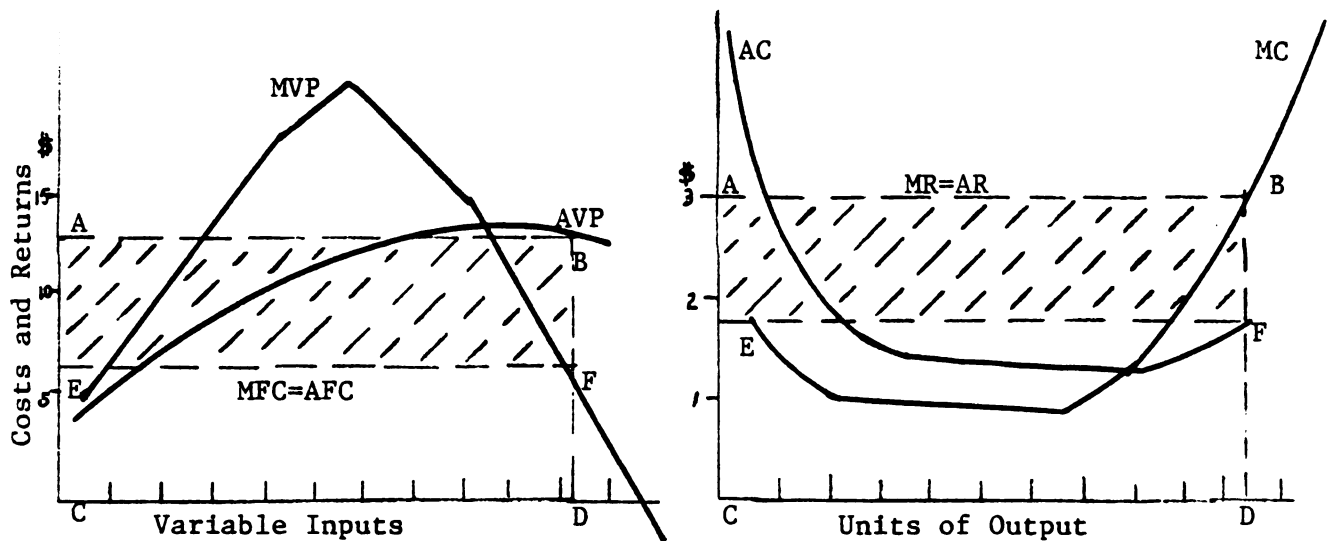
Land rent can be visualized as an economic surplus or the amount remaining from the total value product (TVP) after total costs have been paid. Figure III-1 uses value product and cost curves to illustrate this relationship. The large rectangle ABCD represents TVP which the rectangle EFCD depicts total costs. The shaded area, ABFE, represents

¹Barlowe, Land Resource Economics, p. 156.

²Ibid., p. 157.

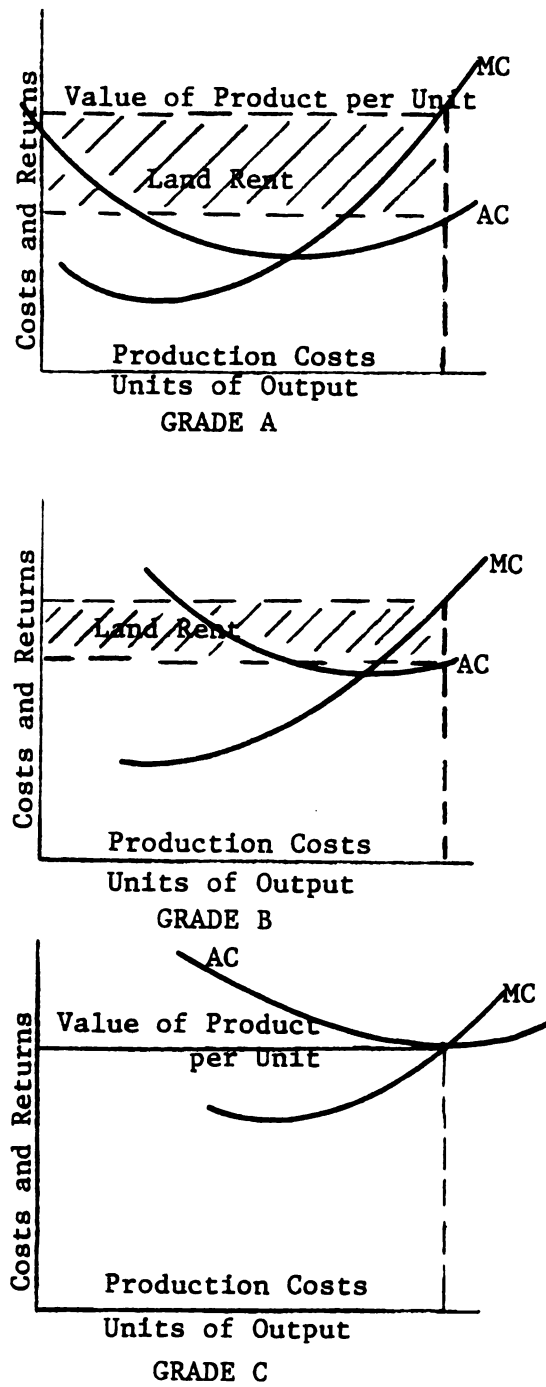
the surplus of returns above costs or the land rent that is produced when land is treated as the fixed factor in production.

Fig. III-1--Land Rent as Depicted by Value Product and Cost Curves



Ricardian rent theory attributes the economic surplus to differences in the fertility of the land. Figure III-2 shows three different grades of land, each producing the same number of output units but at different levels of production cost. Land area A has the lowest production costs per unit of output and thus provides the highest amount of rent. On land C, the value of output and the costs are almost equal and no rent is generated. The actual amount of rent generated depends on the price of the output units and on the costs of the inputs.

Fig. III-2--Land Fertility and Land Rents



Ricardo argued that initially only production from land A was needed to satisfy the market. In this case, no rent was generated. As market demand increased, the price of the output units rose enough to justify extension of cultivation onto the less productive grade B lands. This results in an economic surplus on the grade A lands. Finally, C land will come into production increasing the rent on A and generating rent on B. In each case, the surplus is captured by the owner of the land.

Differences in fertility can be illustrated with the value product diagrams shown in Figure III-3. In, this example it is assumed that all farmers receive the same price for their output, work the same size farm, use the same number of variable inputs (x), and face the same production costs. Differences exist in total output. The more fertile soils produce more output and thus generate a larger economic surplus. Chainat's (locations have been selected to represent soil fertility types) land rent is larger than the other two areas. Actually, a fourth area should be depicted showing a subsistence farm with no marketable surplus, or, in other words, land which generates very little land rent. This situation is exemplified in parts of Northeast Thailand.¹ Additional inputs would not be justified in areas with poorer soils while more inputs could be used to an advantage on better soils. With additional inputs, production could be pushed to the point where $MFC = MVP$. Obviously, Chainat soils would generate a larger land rent because it can move further to the right than in the other two areas.

¹Subsistence farms can generate economic rent in the case where the value of the food produced (value of the labor input) is equal to or greater than the opportunity cost of labor in other occupations. The statement that a subsistence farm produces no economic rent is only true if the inputs (labor) are not earning the opportunity rates of return. More information is needed on the labor and factor markets in Northeast Thailand to make any type of broad generalization.

Fig. III-3--Land Rent from Different Grades of Land and Same Production Costs

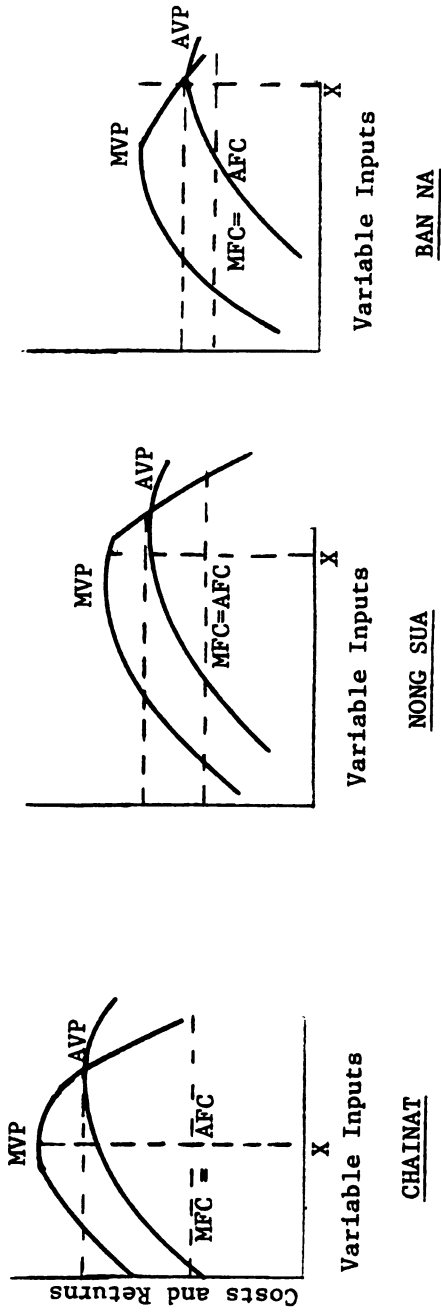
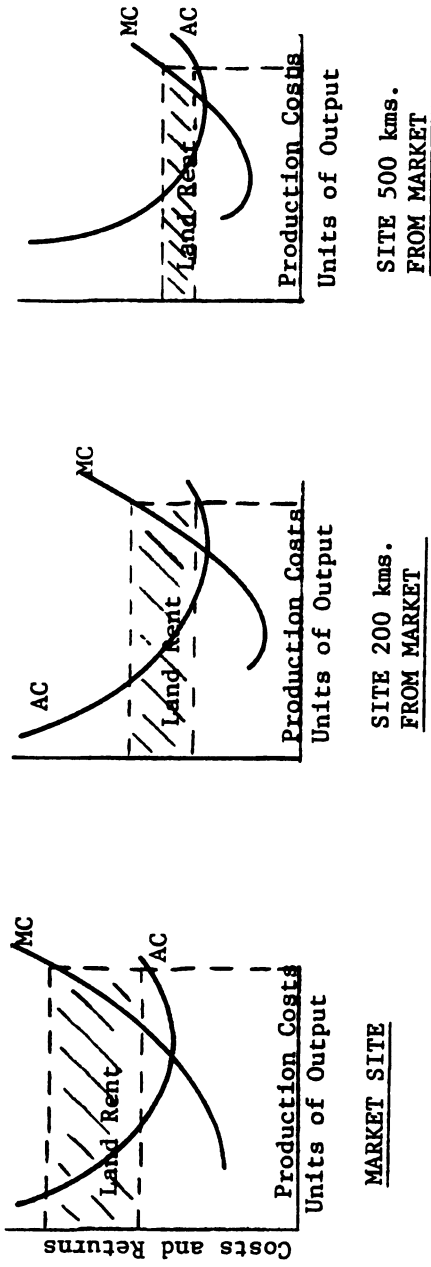


Fig. III-4--Location and Land Rent



Von Thunen explained the economic surplus of land in terms of the land's location relative to the market. (West and Malthus also contributed to this discussion.) A farm located closer to the market paid lower transportation costs than those further removed from the market. Here, the farmer nearest the market enjoyed a bigger land rent. Location can also determine the type of crops grown on particular sites. Figure III-4 illustrates the generation of larger land rents at sites nearer to market sites due to lower transport costs.

Market location does not generally play a large role in generating land rent in Thailand. By stretching one's imagination, Thailand can still be considered a mono-crop (rice) agricultural country. The price for output received by individual farmers is about the same throughout the country, except in selected cases where farmers enjoy a favored position in local markets (glutinous rice growers in the Northeast). Also the marketing system in rice is very competitive and transportation has only a minimal effect on the cost component.

A more important relationship in many cases is the location of land relative to water. If water is available for on-farm use, farmers can generate a large economic surplus. If water is unavailable or cannot be controlled, or, if the farmer lacks credit or the expertise to get water to his lands (even if the canal runs right by his field), land rents will be much lower. This situation can be illustrated by a diagram similar to Figure III-4 in which the three tracts represent areas with an on-farm irrigation system, irrigation from a main system only, and rainfed agriculture, respectively. In this situation, the water resource is actually considered the fixed factor in the production process.¹

¹Some would argue that water is part of the land resource and should not be taken separately. But rice cultivation is unique and requires water

The importance of land rent lies in its explanation of actual field conditions, rather than the theoretical concepts presented above. Two important applications for this study are in the area of rental arrangements and resource investment decisions.

Rental Arrangements

Under ideal circumstances, contract rental rates should correspond with theoretical land rents. Bargaining under these circumstances would find the landowners and the tenants both possessing perfect knowledge of the economic returns to land and willing to accept these returns as rent for a piece of land. The landlord would define his position of advantage as that point where he captures all the theoretical land rent; plus he will take any additional payment he can get. The tenant will attempt to pay no more than the recognized land rent because any payment above that would have to come out of the return to his labor or management.¹ The final contract rental rate will reflect the fairest price that both parties feel is justified by the land rent producing capabilities of the land.

A situation like this rarely, if ever, exists in the world. Seldom does either party have perfect knowledge of the land rent producing capabilities of the property in question. Probably, more important is the fact that bargaining positions are rarely equal. Institutional factors such as customs or traditions, rent control laws, and special landowner-tenant relationships all affect each party's role in the negotiations. Finally,

as well as land: see Soil Interpretation, Ch.VII. The Soil Survey report discusses the unique characteristics of rice growing and why a separate land classification was developed. Water generates its own rent and it is this rent which becomes important when discussing the repayment capacity of farmers in irrigated areas. This argument will be developed later in this chapter.

¹Barlowe, Land Resource Economics, pp. 172-73.

even with fairly accurate knowledge production may be hindered by insects or unusual climatic conditions, so that rates previously agreed upon cannot be honored. As a result, most rental contracts involve numerous assumptions many of which fail to work out as expected. Arrangements are often skewed in favor of one party. Once these types of arrangements are made, accepted, and have become an established system, they are difficult to change.

Two examples of rental arrangements can be found in Barlowe.¹ In Figure III-5, the tenants on tract A enjoy a very favorable tenant rental market. Because of their advantage in bargaining with landlords, they pay less land rent and receive a substantial portion of the total value of the output as return for their labor, management, and capital. This situation arises when tenants have a wide range of alternative employment opportunities. From this bargaining position, tenants can demand a return to their factors of production commensurate with the opportunity costs of these factors in alternative employment. In contrast, the tenants on tract B pay not only a fair rent but also some of the normal return to their labor and management. This situation often occurs when there is keen competition for the land and little opportunity for tenants to find employment outside the farm sector.

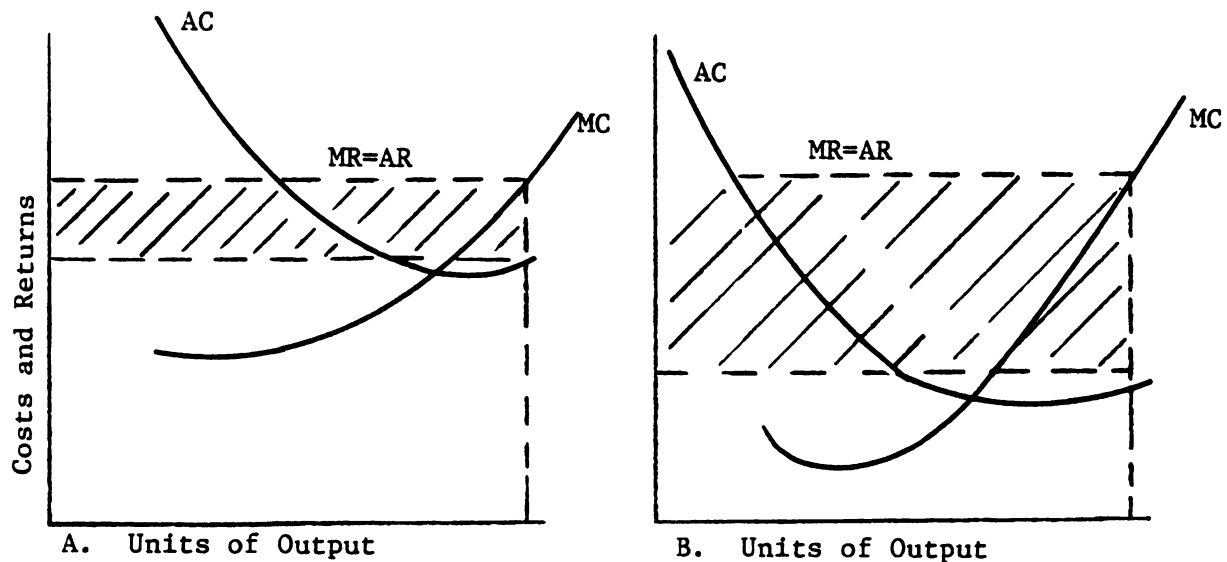
By viewing both situations, one can see that rental agreements generally reflect short-run supply and demand conditions for land and labor. Once the system becomes skewed these short-run changes can become institutionalized. Over time, situation B can result in serious social problems and can precipitate demands for rent controls and land reform measures.

By projecting the returns to land, a range for selecting a fair rental rate can be determined and later charged to ALRO project recipients

¹Ibid., pp. 174-75.

who opt to rent. For the tenant currently cultivating land owned by a private landlord, rental rates after land reform may be higher or lower than what is now paid. Where Crown land and public land rents are already very low or do not exist, farmers would loudly protest any increases in rent even if justified through land rent analysis.

Fig. III-5--Bargaining Positions and Land Rents

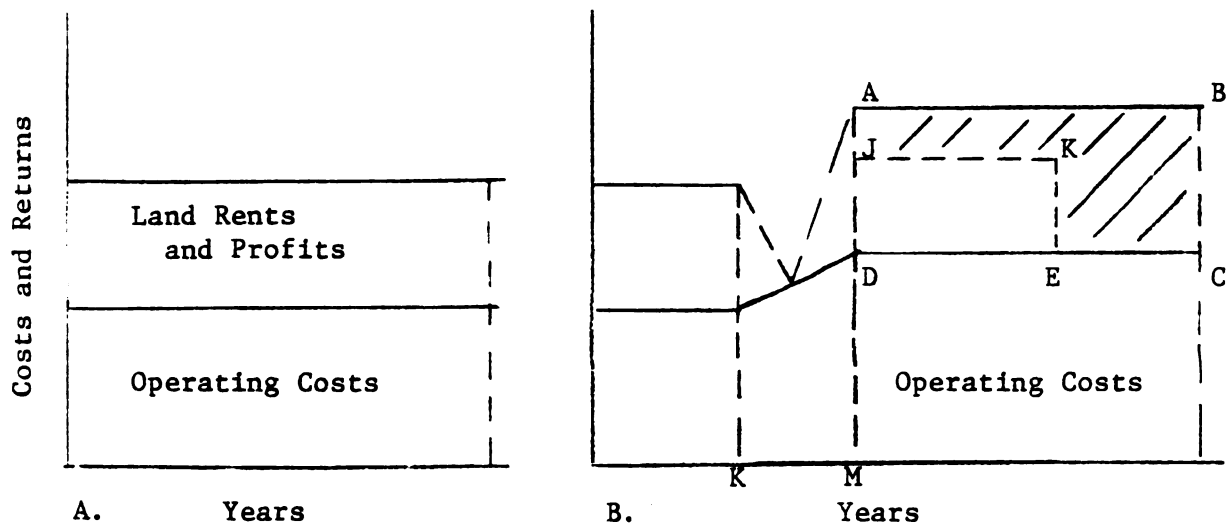


Resource Development Decisions

Those who plan public projects such as those being designed for the declared land reform areas ordinarily assume that the projects will produce sufficient returns to land to cover all or at least part of the investment costs. By charting the future flow of land rents for a particular project, incentives for project beneficiaries and guidelines for investment can be presented to decision-makers.

Suppose the costs and returns for a farmer prior to development looks like illustration A in Figure III-6. In agriculture, the expected relationship between returns and operating costs remain relatively constant over time. A land development project raises new expectations for the generation of a larger surplus. In illustration B a project is initiated in year K. Returns increase as the factors of production, land, labor, capital, and management are used more effectively in the production process. Operating costs also increase, but the land rent and profits increase even faster. It is from the latter amount that investment costs can be extracted. This economic surplus actually depends on an appraisal of future land rents.

Fig. III-6--Development Decisions Using Land Rent



Looking more closely at illustration III-6-B, production levels may actually decline reducing the land rent during the transition stage

of the development project.¹ After adjusting to new techniques and cropping patterns, the farmer will level off production at a higher rate of return, point M. The time between K-M can be considered the grace period before a farmer must begin to repay the investments made in his behalf. How much does he pay? The rectangle DJKE represents investment outlay plus interest. The operating costs are below. The remaining portion, the shaded area, is considered the return to the factors of production--labor, capital, management, and land. Return to land can be split between land and water only with arbitrary assumptions as to which is residual. From the return to water monies can be extracted for reimbursement purposes.

This approach depicts the situation clearly enough so that the decision-maker can visualize over time the type of investment decisions he wishes to make. The expected flow of returns can be quantified through the use of farm budgets.² An attempt should be made to maximize returns in order to recapture more of the investment and still provide the farmers with enough incentives to participate in the project.

Alternative Cost-Recovery Approaches

Three alternative approaches to cost-recovery are currently available to be used in Thailand. Each method has relied to some extent on land rent theory as the cornerstone for its analysis. Consideration will be given in this section to the three approaches, starting with that of the World Bank, then the Department of Agricultural Economics and, finally, the approach endorsed by ILACO.

¹In some countries, such as Bolivia, temporary reductions in economic rent have occurred. It is probably best to admit that reductions are possible before the project is implemented.

²If an established land market was available, the capitalization approach could also be used in determining land rents.

World Bank Approach

As was mentioned above, two basic principles underlie the cost-recovery policy of the World Bank. First is the concern "with the level and structure of the prices to be charged for the output from a project so as to maximize its net economic benefits to the economy, i.e., with "efficiency" prices." The second consideration "relates to the desirability of adjusting the efficiency prices, or charging alternative taxes, because of fiscal and financial concerns or on income distribution grounds."¹ In other words, the general thrust of the bank's approach is to (1) establish a fair price for a new or improved production input (the output of the project) and (2) recognize a favorable return to a participant's own labor and management, which determines the allocation of the project's benefits.

The project setting actually determines how these considerations can be best applied. Duane's report assumes that projects will be developed in heterogenous farming areas with a mixture of farm sizes and tenancy relationships. A situation like this calls for criteria concerning the amounts beneficiaries can be charged relative to their ability to pay.

For distinguishing between different beneficiaries, a criterion, defined as the consumption level "at which the social value of a unit of extra consumption equals the social value of a unit of extra tax revenue,"² was used as a monitoring device. Those whose incomes were below the critical consumption level would be exempt from any taxes, while

¹Paul Duane, A Policy Framework for Irrigation Water Charges, Bank Staff Working Paper No. 218, (Washington D.C.: World Bank, 1975), p. i.

²Ibid., p. ii.

those above would be required to pay a progressive tax in relation to their incremental income above the critical level.

The tax mentioned above refers to a benefit tax levied on project participants who benefit from irrigation services. Another possibility in generating revenue is through the use of a volumetric pricing system. This latter scheme is not very practical in developing areas because of the small farm size, which would require the installation of many metering devices--an extremely expensive venture.

Total incremental recoveries can be expressed by:¹

$$R = R_e + R_b + R_o$$

where: R_e = incremental revenues from water sales.

R_b = incremental revenues from benefit taxes.

R_o = net influence of general taxes.

On the project level, R_o revenues are not usually considered as any adjustment in general taxes would affect persons unrelated to the project. Water sales are also dropped from the equation because of the difficulties already mentioned. Thus, cost-recovery policy focuses on R_b or the tax on benefits derived from the project.

Project benefits captured by the beneficiaries can be viewed in the following manner:²

R = Incremental sales at farm gate prices

n = Incremental costs at imputed supply prices of family labor and management incurred

p = Incremental outlays on water, if volumetric pricing is undertaken

q = Other incremental production expenses, at market prices, incurred by the farmer

¹Ibid., p. 16. ²Ibid., p. 17.

$C = n + p + q =$ Incremental production costs

$Y = R - C =$ Incremental income gain net of family labor costs (n), or project rent

Introducing benefit taxes and treating returns to family labor and management as income:

$b =$ Incremental revenues from a benefit tax

$B = Y - b =$ Incremental net benefits received by farmers

$M = B + n =$ Incremental net disposable monetary income

In some countries an income tax, t , is assessed on M which means that B must be redefined as:¹

$B' = Y - b - t(Y - b + n) = (1 - t)B - tn$
 $=$ Incremental net benefits received by farmers after income taxes

$M' = (1 - t)M =$ Incremental net disposable monetary income after income tax

$T = tM =$ Incremental income tax revenues

The central issue here concerns the size of B' (B , if there is no income tax) that should be received by the farmers. The larger B' (b), the less revenue can be regained through a benefit tax. Therefore, the decision, a public one, must be made as to whether the social value of additional public income or the social value of additional income to project beneficiaries is more beneficial to the country. One way to determine B' (B) is to derive a socially acceptable target income. Any income over this amount can be attributed to b .

Aside from being determined by B' (B), the benefit tax can be viewed as part or all of the land rent or project rent (defined by Y above) due to irrigation. The maximum amount of tax charged to the farmer cannot realistically exceed the project rent. By siphoning off all the project

¹Ibid., p. 18.

rent, incentives for farmer participation are removed thus jeopardizing the goals of the project. The project rent can best serve as a base for the benefit tax, which can be adjusted downward to account for returns to capital, labor, and management and allow for uncertainty.

Statistical indices are available which can relate revenues to both costs and benefits, as applied to a working norm. For bank purposes, the working norm is defined as 100 percent of total costs incurred by the public sector¹ (discounted by the opportunity cost of capital). The cost-recovery index is defined as the "present value of total revenues expressed as a percentage of the present value of total public costs,"² or the ratio $(p + b)/A$, where A is incremental financial costs incurred by the public sector.³

If a wide range of beneficiary classes, i.e., different income levels, are found in the project area, the benefit recovery index may be useful in promoting income redistribution if such a policy is so desired. The benefit recovery index is the ratio of "(incremental revenues from water sales, if any, and from benefit taxes to be paid by beneficiaries) to (incremental income accruing to beneficiary farmers before payment for water and benefit taxes, but net of their incremental payments of general taxes),"⁴ or:

$(p + b)/(M' + p + b)$.⁵ If water charges are infeasible, p is dropped and the ratio becomes $b/(M' + b)$ or

$b/(B' = n + b)$. Treating family labor like other productions costs, the ratio is further reduced to $b/(b' + b)$.

¹Ibid., p. 22. ²Ibid., p. 3.

³Ibid., p. 22. ⁴Ibid., p. vi.

⁵Ibid., p. 22. In this ratio and the previous one, measurements are made in present values in real, constant price terms.

Both these indices are useful as descriptive tools. As the benefit recovery ratio reaches a maximum (b is larger), the project beneficiary captures less and less of the project benefits. This ratio can be used to facilitate discussion on the appropriate level of a tax. The cost-recovery index gives decision-makers some idea of expected recovery of costs.¹

A few remarks on the bank's procedure are in order. A basic assumption of the bank is that cost-recovery is not related to the average income of project beneficiaries, instead to the average income of different income classes within the project area. With ALRO projects this is not applicable if units of equal size give equality. In analyzing ALRO projects one level of income will be employed in the calculations.²

Duane's policy position does not mention any returns to capital. When a farmer switches from traditional methods to more intensive agricultural practices, new capital requirements are made on the farmer. If there is no return allocated to this new use of capital, farmers may be reluctant to vigorously pursue the use of these new inputs.

Finally, there is a definitional problem with the term project rents. It is not clear if Duane is dealing only with the returns to the water component or is he actually referring to the total land rent. The above

¹A review of 17 bank irrigation projects shows that the cost-recovery index averaged 29 percent (range 8-49 percent) and that water charges amounted to an average 17 percent (range 5-33 percent) of incremental income. See, *Ibid.*, Annex 2. Similar problems have plagued the Bureau of Reclamation in recovering public funds for irrigation development in the western regions of the United States, see above.

²Over time equality between units will certainly change, as some farmers possess better management skills than their neighbors. Soon distinct differences in income levels will appear between farmers. Also, it is possible that some farmers will be able to retain more land than others, because of exceptions in the Land Reform Act. This factor could also lead to some disparity.

discussion assumes that project rents apply to total land rent with no distinction between the land and water components. Drawing a distinction between these two components can be useful in arriving at an equitable benefit tax.

Department of Agricultural Economics Approach

On a request from the World Bank, the DAE appraised land consolidation projects in the Chanasutr, Singburi area in terms of its cost-recovery potential. The basic approach considered the net income of farmers before and after the project. The difference between the two incomes was used as the measure for recovering costs. Two criteria, farm size and soil capability, were employed. The approach was adapted to the department's linear programming model which permits injection of a number of variables, e.g., various interest rates and time periods, into their analysis.¹

The capability of farmers to pay for irrigation development is examined under two cropping alternatives. Alternative 1 assumes that farmers will grow high yielding varieties (HYV) of rice during the wet season. In alternative 2, farmers will follow traditional practices using traditional rice varieties. For each alternative, two price levels for paddy, 1,000 Baht and 1,500 Baht per ton, were used to calculate net cash income. The income figures were figured for repayment periods of 10, 15, 20 and 25 years and grace periods of two or five years.

A list of costs was prepared and ranked as follows:²

¹The only available report in English is a brief "Summary and Conclusion" paper. At this time, the original Thai text has not been translated. The following sketchy review has been taken from the summary and interviews with officials in the DAE.

²DAE, Summary and Conclusion Appraisal of the Land Consolidation Project, Chanasutr, Singburi and Study on Recovery of the Cost (Bangkok: Ministry of Agriculture, 1976), notation preceding Figure 7.

1. O & M cost of the land consolidation
2. A set of costs, including:
 - a. Land clearing, land leveling
 - b. Issuing title deed
 - c. Public investment in farm roads, ditches, drains, division blocks, etc.
 - d. Surveys, design and consolidation administrative services
3. O & M cost of the irrigation project
4. O & M cost of the irrigation headwork
5. Cost of the irrigation project
6. Cost of the irrigation headwork

An optimal chargeable amount was derived by determining the lowest level of net cash income obtained under the alternatives 1 and 2.

Costs were applied against this amount until the whole amount was captured or a predetermined payment rate was reached. Besides the repayment periods and grace periods mentioned above, interest rates of 4 percent, 8 percent, and 12 percent were used as was a compound interest rate of 4 percent during the grace period. Each combination of variables provided a different payment rate.

For example, the repayment charge was calculated for O & M costs of land consolidation and costs of land clearing and leveling, under the different conditions.¹ Those repayment charges above the lowest net income level were identified as conditions under which farmers were unable to make any payments. Under conditions of short payment periods (10 and 15 years), high interest rates (12 percent), and long grace periods (5 years) farmers could not meet the prescribed payment rate. The next step was to include the cost of issuing land titles, whereby a few more options dropped out. When the cost of building farm roads, etc. was

¹Ibid., pp. 2-14.

added, only a very few options remained open as possible payment rates. O & M costs for the irrigation project could be recovered only in two cases (20 or 25 year payment period, two year grace period and an interest rate of 4 percent). With the addition of O & M costs for the irrigation headwork, only one possibility remained. Items 5 and 6, above, could not be recovered under any conditions.

Additional calculations were made to illustrate the net incomes associated with different alternatives. Obviously, a farmer following alternative 1 and receiving 1,500 Baht per ton could make reimbursements on more of the project costs.

To recover most of their investment costs, the government will need to encourage farmers to accept improved farming practices. Incentives are needed for this. No mention was made in the report of returns to the farmer's labor, management, and capital. The DAE's calculations simply captured as much of the net benefits as possible. If such a policy was actually carried out, few farmers would participate, seeing nothing in it for themselves. Careful considerations should be given to the farmer's incentives to insure successful project implementation.

One further step taken by the DAE can be quite helpful in this analysis. Under the Land Consolidation Act the government must subsidize at least 10 percent of the expenses with the farmers contributing the rest. In actuality, the government subsidizes more than that. At Sapphya in Chainat the government agreed to subsidize 35 percent of all expenses on land consolidation.¹ According to the agreement, the farmer

¹Ibid., p. 22. This is the only reference the author has found where the government has subsidized a land consolidation project to this extent. Most officials say that legally the farmer will have to pay 90 percent; historically the government has paid 100 percent of the costs. In a field trip to Sapphya, the author found no evidence that the farmers were making any payments on land consolidation investments.

would contribute 65 percent to all the expenses listed above, except for the title deed, which the government gave to the farmer free of charge. The DAE is also looking at another option whereby the government subsidizes 60 percent of the costs. These examples lend support to some of the cost considerations made in the next chapter.

ILACO Approach

The Dutch consulting firm, ILACO, has been involved for a number of years in the irrigation project known as the Chao Phya (sic) Irrigated Agriculture Development Project. During the preparation of phase II of the project, an assessment of cost-recovery was undertaken to satisfy World Bank requirements for financial assistance.¹ The approach can be considered a farm management budgeting approach for determining marginal returns to the land as a result of irrigation development.

Basic to this approach is a recognition of the economic return to land. The first step in determining the project rent involved a calculation of present and future farm budgets, with and without the project, for four different stages of irrigation development:²

1. Rainfed agriculture;
2. Irrigated agriculture in the wet season only, using supplemental water from main irrigation system;
3. Irrigated agriculture in wet and dry season using water from the main system;
4. Irrigated agriculture in wet and dry season, through on-farm irrigation (land consolidation) works.

¹The DAE cost-recovery will be submitted to the World Bank along with Thailand's request for a loan. ILACO's report was prepared to facilitate discussion and formulate recommendations.

²ILACO, Chao Phya (sic) Irrigated Agriculture Development Project, Feasibility Study-Stage II (Bangkok: Royal Irrigation Department, Sept. 1975), p. 353.

After determining net income (gross production value less production costs), the project rent is factored between the different inputs in the production process--capital, labor, management, and land. Subtracting out capital, labor, and management, the return to land is left. Under rainfed conditions this amount is attributed solely to the land component. With irrigation improvements, water becomes an additional input and shares in the returns to the land factor. Assuming the return to land to be represented by the amount earned under rainfed agriculture, in stages 2, 3 and 4 the increase in the land rent over the assumed amount is attributed to the water component. In this case, the land rent is divided into a return to land and a return to water. The return to water indicates the repayment capacity of the farmer.

Costs are determined for the implementation of one rai. Costs include all investments in on-farm development, i.e., survey, title deeds, design, land clearing and leveling, road construction, excavation of drains and ditches, and administration. Charges may also be made for rehabilitation of the main system.

From the return to water, a chargeable amount was determined for both seasons. The first cost to be collected was the amount for O & M of the land consolidation system. Any remaining portion of the chargeable amount was applied to the cost of the on-farm investment. Using a grace period of three years, repayment periods of 10, 15, 20, and 25 years, discount rates of 8 percent and 10 percent, and an annual increase in the wage rate of 9, 2, and 3 percent, the report was able to suggest how long the recovery period would be to recoup investment funds.

In a more dynamic situation, a mathematical formula is necessary to account for factors which vary over time, especially the yield of paddy

per rai, rice price index, and the index of consumer price in rural areas.¹ To accommodate these factors ILACO economists developed an equation to arithmetically express the allocation of total factor income between the various factors of production.²

The first step is to find the factor income attributed to water, which is expressed as:³

$$C_D^0 = \Delta F^0 - \Delta L^0 - \Delta M^0 - \Delta R^0$$

where: $C_D^0 = (W_D^0 - W_C^0)$, or the chargeable amount in year 0 is equal to the extra factor attributed to the factor water because of the implementation of on-farm development, in Baht per rai.

$\Delta F^0 = (F_D^0 - F_C^0) = (1-p)(Y_D^0 - Y_C^0)P^0$ is the extra factor income resulting from the transition from level C to level D in year 0, in Baht per rai.

$\Delta L^0 = (L_D^0 - L_C^0) = W^0(l_D^0 - l_C^0)$ is the extra remuneration of the factor labor in year 0, due to an increase in the labor input after project implementation, in Baht per rai.

$\Delta M^0 = m(Y_D^0 - Y_C^0)P^0$ is the remuneration of the factor management in year 0, in Baht per rai.

$\Delta R^0 = (R_D^0 - R_C^0)$ is the extra land rent in year 0, due to land improvement within the framework of the project in Baht per rai.

W_C^0 = factor income attributable to irrigation water in year 0 prior to the implementation of on-farm development works, in Baht per rai.

W_D^0 = factor income following project implementation

Y_C^0 = average rice yield in year 0, prior to project implementation, in kilogram per rai.

Y_D^0 = average yield after project implementation.

p = proportion of the gross production value that is to be spent on production costs.

p^0 = farm gate price of rice in year 0, in Baht per kilogram of paddy.

W^0 = wage-rate in year 0, in Baht per working day.

¹Ibid., p. 352. ²Ibid., p. 380. ³Ibid., pp. 380-81.

l_C^0 = labor input in year 0, prior to project implementation, in working days per rai.

l_D^0 = labor input in year 0, after project implementation.

m = share of the gross production value for the remuneration of the factor management.

R_C^0 = land rent in year 0, prior to project.

R_D^0 = land rent in year 0 after implementation of project.

The formula can be rewritten:

$$C_D^0 = \{(1-m-p_D^0)Y_D^0 - (1-m-p_C^0)Y_C^0\}P^0 - W^0(l_D^0 - l_C^0) - (R_D^0 - R_C^0)$$

Next, the formula for factor income attributable to water after implementation of irrigation project resulting in increased production over time is defined:¹

$$\Delta C_D^n = \Delta F^n - \Delta L^n - \Delta M^n - \Delta R^n$$

where: $\Delta C_D^n = (C_D^n - C_D^0)$ is the extra factor income attributable to the water due to further agricultural development after project implementation, in Baht per rai.

$\Delta F^n = (F_D^n - F_D^0) = (1-p)(Y_D^n - Y_D^0)P^0$, in Baht per rai.

$\Delta M^n = (M_D^n - M_D^0) - m(Y_D^n - Y_D^0)P^0$, in Baht per rai.

Y_D^n = average yield in year n, after project implementation.

p = proportion of the gross value that has to be spent on production costs. The values of p differ depending on cropping pattern and method of planting.

$W^n = W^0(1+r)^n$ is the wage rate in year n, in Baht per working day; r is the annual percentage increase in wage rate.

$\Delta L^n = (L_D^n - L_D^0) = W^0(l_D^n - l_D^0)(W^n - W^0)l_D^n$, in Baht per rai.
Represents the extra remuneration of the factor labor due to increased labor input, and the extra remuneration due to the increases in wages.

The final step is to combine these two equations by eliminating the parameter l_D^n by using the relationship:²

$$W^n/W^0 = (Y_D^n/l_D^n)/(Y_D^0/l_D^0)$$

¹Ibid., p. 382. ²Ibid., p. 383.

which is valid if the increase in the wage rate and labor productivity balance over time. The resulting formula is:¹

$$C_D^n = C_D^0 + (1-m-p) (Y_D^n - Y_D^0)P^0 - W^0(1_D^0/Y_D^0)(Y_D^n - Y_D^0) - (R_D^n - R_D^0)$$

where $p = p_D^0$, assuming that $p_D^n = p_D^0$ or that production costs will increase in proportion to the increase in production.²

The last formula can be modified to account for the effects of inflation on the repayment capacity of farmers and for the failure of wage rates to increase in balance with labor productivity. Also, changes in cropping intensity over time can be incorporated into the formula.³

This approach may be viewed as an extension of land rent theory. By recognizing the return to land, repayment rates can be determined for the contribution of new input such as water. Probably the best feature of ILACO's approach is the built-in incentive structure for farmers through the fair allocation of the benefits between the other input factors. Another feature worth mentioning is this study's great applicability to actual field conditions, which vary over time. More will be said about the advantages of this approach in the next section.

A word of caution should be injected here. Historically, when irrigation has been developed in a country with an excess labor supply, the benefits flow principally to the land owner rather than to labor,

¹Ibid.

²The assumption of constant cost is valid in many cases in mature economies. During transition period, when price fluctuations are occurring in the market, new technologies are being introduced and land use is being intensified, the constant cost assumption may not necessarily be valid. Thailand's agricultural sector will certainly face economies of scale during the intensification of land use. The more important shifts will occur in the off-farm sector, i.e., cooperatives. Internal shifts, such as farm size, will probably occur much more slowly. Thus, careful consideration must be given to this formula.

³See ILACO, Chao Phya (sic) - Stage II, p. 387.

management, and capital. This situation may well be expected to occur in Thailand unless a strong land tenure program accompanies further irrigation development.

Strengths and Weaknesses: A Summary

Prior to setting down the procedure for the analysis to be used in this report, a quick review of the strengths and weaknesses of the above approaches would be helpful.

Paul Duane's work in formulating a framework for collecting water charges is theoretically and realistically sound. Incorporating distributional questions into the framework assists in presenting the role of participant incentives to the decision-maker. Though he stresses the use of water charges to promote more efficient use of water, he realizes that it is very impractical in developing countries. Falling back on a benefit tax, Duane shows how the tax can be used as a policy instrument to encourage the distributional aspects of project benefits. There are two shortcomings in this method. First, the return to capital is neglected during the measurement of the different components of project rent. Actually, the weakest part of Duane's theory comes in not treating implicitly the returns to factors of production within his framework. Second, he does not distinguish between the return to land and the return to water. In some cases, irrigation development is accompanied by other land improvements. The entire increase in income after project implementation cannot be attributed solely to water. Overall this approach gives sound introduction to cost-recovery and will serve well in a supportive role in this study.

Probably the biggest advantage of the DAE's approach is the wide range of variables that can be accommodated in the computer program. In

most respects the DAE's evaluation is very narrow in scope. Simply, the report's objective was to capture as much of the net income, resulting from the project, as possible. No mention was made of: (1) farmer incentives, or returns to other factors of production; (2) social equity; and (3) risk allowance for uncertainty in production. Investment decisions, which in this case are political decisions, cannot be made strictly on numbers derived in this manner.

ILACO's approach is by far the best method. Taking into consideration the returns to the factors of production, this study also recognizes a distinction between the land and water component, makes allowance for uncertainty, and stresses the need for farmer incentives to insure participation in the project. A few minor changes will have to be made to fit this approach to the conditions of the two land reform study areas. These areas are much more homogenous than the land consolidation areas. Also the returns to the land components will be different due to an active land improvement program which will be carried out in conjunction with the irrigation project.

The important weakness in this approach is the preciseness in which the factors of production are measured. It is an unwarranted assumption that marginal productivity analysis can determine with some precision the return to any factor of production.¹ In some cases, factors can be overvalued or undervalued--therefore, attributing the wrong value to the land factor. Labor and capital can usually be valued at their going market rates, but the productivity of management is an often elusive figure.² In employing marginal productivity analysis, it is important

¹Barlowe, Land Resource Economics, p. 161.

²For an example of the problems in dealing with the management factor, see Ibid., p. 169.

to impute fair returns for the different factors. (For an analyst, this is difficult to do unless he is completely neutral in his role between participants and decision-maker.)

Project Methodology

To determine the level of charges in this study a number of discerning factors must be taken into consideration. Specifically, they are:

1. Incentive allowance to encourage farmers into new practices;
2. Risk allowance for uncertainty in agricultural production;
3. Social equity question on size of farmer income; and
4. Desired speed of capital recovery.

Some of these factors are obviously political decisions which can only be made by the government. Others can be handled through the use of data from socio-economic surveys and careful field observations.

Very important to the analysis is the recognition of changes which farmers will have to make in switching from a traditional method of agricultural cultivation to a more intensive one. This transition calls for more inputs from capital, labor, and management. Farmers will have to adopt new patterns of input allocation. The level of charges determined here should reflect a fair return to these additional inputs. The central question which the analysis will deal with concerns the level of charges above which a farmer will make no attempt to change his production process from traditional methods to intensive methods using irrigation.¹

¹Duane, A Policy Framework, p. 2.

The approach taken in this study employs the concept of land rent, which can be divided into land and water components, and the basic procedure established by ILACO, with some minor alterations to meet particular characteristics found in the selected land reform projects. It is the intention of this approach to recognize the increased returns to capital, labor, and management as farmers switch to different cropping systems. Once these factors have captured their appropriate returns, land rent can be calculated. Using with-without analysis, land rent can be further divided into returns to land and returns to irrigation water. Based on these returns, appropriate charges for recovering investments can be levied as long as other project objectives are not jeopardized.

Procedures have been kept as simple as possible so the analysis can be duplicated by the ALRO. Every step has been carefully explained and the assumptions are explicitly stated. All details can be found in Chapter VII, which deals with the cost-recovery analysis.

Summary

Cost-recovery analysis is an integral part of the economic analysis of selected land reform projects. Not only does the analysis determine the level and structure of charges for project outputs (land and water), it identifies the benefits accruing to individuals and society of the project. Cost-recovery is complicated by the fact that it has income distribution and redistribution as well as economic efficiency implications.

The concept of land rent is the key principle to developing cost-recovery procedures. After all, input costs have been covered and the other factors in production, capital, labor, and management have

captured their returns; the remaining portion represents the economic returns to land and water. Appropriate charges for land and water development can be based on the economic return to land and water.

Three approaches to cost-recovery were reviewed in this section. Each had its own strengths and weaknesses and used the concept of land rent in varying degrees. The ILACO approach proved to be the most useful in developing the cost-recovery approach used in this study because of its strong land economics orientation and its recognition of the necessity for providing strong incentives to farmers, keeping them interested in the project.

The steps in this analysis entail a with-without examination of farm income, discounted at various rates; followed by the distribution of returns between the various inputs--capital, labor, management, land, and water; next an estimation of project costs; and finally, determination of repayment levels. The first step is carried out in Chapter VI and the last three in Chapter VII. In the next chapter, project benefits, project costs, and the criteria for analysis will be presented.

CHAPTER V

PROJECT COSTS, PROJECT BENEFITS AND CRITERIA FOR ANALYSIS

Project investments in the proposed land reform areas will come for the most part from the public sector. The purpose of this analysis is to compare cost and benefit streams. Unlike an economic analysis which might select the most remunerative of a number of alternatives, this study looks at the return to the equity capital contributed to the project by each of the various participants, public and private.¹ For the farmer, the return is measured by the improvement in his income. For the public there are many possible returns with return on investment being very important to administrative officials. Since we will be comparing costs and benefits, it is important to identify both. Emphasis is given in this chapter to identification of different types of costs and benefits and to a discussion of some of the theoretical issues surrounding certain costs and benefits. Choice of specific costs and benefits for project analysis is discussed in the section dealing with the formulation of the criteria used in this analysis.

Project Costs

Most project analysts agree that it is easier to identify costs, than benefits. Costs can be classified in many different ways, such as

¹J. Price Gittinger, Economic Analysis of Agricultural Projects (Baltimore: The John Hopkins University Press, 1972), p. 6.

long run or short run, fixed or variable, out-of-pocket or opportunity, investment outlays, operating costs, time and supersession costs, and depreciation and obsolescence or sunk costs. Emphasis will be given here to three cost concepts used with land development projects in Thailand. These are the concepts of: short run or fixed, sunk, and opportunity costs. Fixed costs occur under short run conditions and can be defined as costs which arise over the production period, during which the operator is limited by the fixed supply of particular inputs.¹ A farmer's production costs, annual operation and maintenance costs, rents and land taxes fall into this category.

Sunk costs provide a basis for measuring returns to agricultural development. During project planning, designers must keep in mind the relationship between nonrenewable investment outlays and potential returns. Total expected returns should exceed costs. Once a project is completed, the actual cost of development is no longer important. Construction outlays become 'sunk costs' because they can no longer be withdrawn or recovered. Thereafter the investment outlay is committed to the use for which the project is designed.² All nonrenewable project development costs fall into this category.

Opportunity costs are "the social value foregone when the resources in question are moved away from alternative economic activities into the specific project."³ This means that public funds put into a project are lost to other projects or potential projects on which they could have been spent. Beneficiaries from project developments also are effected by

¹Barlowe, Land Resource Economics, p. 143.

²Ibid., p. 335.

³E. J. Mishan, Economics for Social Decisions Elements of Cost-Benefit Analysis (New York: Praeger, 1973), p. 13.

opportunity costs. Many farmers earn a substantial portion of their income in off-farm employment. If after the project, the farmer must work on-farm the whole year, the off-farm income foregone would become an opportunity cost.

Identification of Costs

The following costs have been identified and are considered to be the principal costs involved in the project.

Farm production costs. The goods and services purchased by the farmer are easy to identify. In making projections it is difficult to determine how much a farmer will spend on needed inputs. Past performance does not help especially if supply of inputs change, as does farming methods. Production expenditures can be monitored through farm budgets, and if any large deviations from projections are found, appropriate corrections can be made.

Operation and maintenance costs (O & M). After project completion, irrigation canals and sublaterals must be maintained to insure proper water flow and the continued productivity of the project. Section 47 of the Land Consolidation Act, specifically states that:¹

All the owners or recipients of rights to the land or cooperatives of farmer groups . . . shall pay the expenses for repair and maintenance of the irrigation or drainage systems, roads or paths of conveyance to the farms and other utilities for common use including the expenses in providing water

Project reclamation and development costs. The Land Consolidation Act provides that all the expenses for construction of irrigation and drainage systems, farm roads and paths, leveling and grading of land, and other

¹Land Consolidation Act, B.E. 2517, Section 47.

activities on the land of the landowner or recipient, be collected from the owner or recipient to assist in defraying the actual expenses which the government paid.¹ The Land Consolidation committees will prescribe that so much of expenses be paid back at a certain rate and within a certain time period. There appears to be a contradiction here, possibly due to translation, between collecting all the expenses and prescribing a repayment rate. What is intended is that the committees have the alternative of reducing the repayment rate if local conditions so warrant.

Public utility costs. Section 46(1) also calls for the repayment of the construction costs of those public utilities used by the owner of the land or the recipient of rights to the land.² This cost will surface again during the discussion of cost issues. It is generally accepted that those public utilities which promote rural welfare should be sponsored by the government, and that the recipients should pay for services provided but not for the construction costs. Urban residents do not directly pay for many services such as street construction and sewer maintenance, even though everyone benefits. The same criteria should be applied in rural areas.

House construction and other development costs. The Land Reform Act provides for improvements in housing arrangements in agricultural areas. This provision is of great importance to landless people and tenant farmers who may not have their own homes. The Hupkapong Project provided loans of 2,000 Baht to project participants to cover the cost of constructing simple shelters. This idea has been carried over into the land reform

¹Ibid., Section 46 (1),(2).

²Ibid., Section 46 (1).

reform program. Not all project areas will require construction of homes, but in cases where land is divided into smaller parcels, homes may have to be constructed for farmers moving onto the land.

Government expenditures for cadastral survey, issuing title deeds and acquiring land. Cadastral surveys are an important part of any sound land program. Expenses associated to the conduct of the cadastral survey in land reform areas and the cost of maintaining land records should be borne by the government. Title costs are also borne by the government:¹

If the ALRO is concerned with any activity required by law to be registered in the real estate or property right in connection with the real estate, stipulated in the agricultural land reform, the ALRO shall be exempted from paying the fees levied for such registration.

Land acquisition costs present many problems. Thailand has a relatively inactive land market and purchase prices, when land sells, are not always good indicators of true market value.² Questions arise concerning whether land should be sold to project recipients at the government acquisition price from private owners or be sold instead at prices more reflective of the land's net contribution to production. This issue will be addressed further in the next section.

Interest on government outlays for acquiring and developing lands. In acquiring land the government will use bonds and cash for payment. Interest on bonds will have to be paid upon maturity. Depending on budget

¹Land Reform Act, Section 38.

²There are a number of defects in the land market which cause it to operate inefficiently. The defects would include: lack of information, inaccurate description of the land, imperfect specifications of ownership rights, ineffective credit system to support market, unclear method of title transfer, absence of a court system to facilitate transfer, and the divisibility of the product.

conditions, the government may decide to borrow money from organizations such as the World Bank, or sell bonds to cover development costs. In both cases interest would have to be paid. Who should pay these costs usually is not controversial. These are contracts involving the government, and are not passed on to the project recipient.

Public costs for administration of land reform. The Land Reform Program is a social welfare measure pursued by the government in response to the general needs of the public. All costs of administration and management are the responsibility of the government.

Opportunity costs. The major opportunity costs have been previously identified in the introductory comments to this chapter. These costs will show up during the discussion of possible alternatives.

Issues and Theoretical Implications

Emphasis will be given in this section to discussion of some theoretical implications associated with the inclusion or deletion of particular costs in the analysis. The two major areas of discussion will center on the historical versus legal precedent, briefly touched upon in Chapter II, and land values, the question of buying and selling land, and fair rental rates.

Before concentrating on these issues a brief comment should be made concerning the other costs. Farm production costs will be paid by the farmer. Farmers decide upon and purchase their own inputs. Assistance from project administering agencies, is needed, however, to assure availability of supplies and to extend information concerning the use of such inputs. Even without historical precedents, the payment of O & M costs is a must, and should be paid by the recipient, in the form of a

fee to hire laborers, or labor, itself. A project with a proposed life of 20, 30 or more years can only be insured if the facilities provided are properly maintained.

Though the government would like to pass on as many costs as possible, it is assumed that it will bear the costs for administration and interest charges. These charges can be laid to government as the carrying out of land reform was a public decision. With private developments, however, outlays for administration costs and interest charges would be treated as private (real) costs.

Finally, the costs associated with home construction should be the responsibility of the recipients. Though there is some social value in providing adequate housing to former landless people, the benefits are largely private. Homes can be provided in two ways. Farmers can receive a long-term, low-interest loan to cover construction materials and use their own labor to build houses. Or, the government can build the houses and allocate repayments over prescribed repayment periods. The first method would probably work best and accrue the least total costs. This approach was used successfully at the Hupkapong Settlement project.

Programs for recovering investment costs presents a more difficult prospect. Historically, farmers have never participated in government projects. As the ILACO staff has found:¹

. . . beneficiaries of irrigation development projects in Thailand have never been asked to pay any direct charge for the recovery of the investment costs of these projects, nor even for their operation and maintenance.

An FAO report on agricultural credit indicates that farmers also pay back government loans late because they often view them as a gift.²

¹ILACO, Chao Phya (sic) Project, p. 351.

²FAO Working Paper No. 5, Agricultural Credit in Thailand with Special Reference to Fertilizer Use (Bangkok: FAO, 1971), p. 92. There may be a

In light of historical precedent, what legal basis is there for collecting various charges? The Dike and Ditches Act of 1962 stipulated that the landowners are responsible for improvements to irrigation works. This act was applicable to all irrigation projects throughout Thailand. The State Irrigation Act of 1964 set a five Baht per rai fee on water supplied by irrigation. Neither of these acts appear to have been enforced. The government usually hires laborers to maintain ditches and dikes, though some beneficiaries participate in this activity. No governmental mechanism is set up to collect charges.

With the enactment of the Land Consolidation Act in 1974 legal provisions were established for charging project costs to the recipients. The Dutch group working on the Chao Phya irrigation project has found that it is important to define these costs. For example, legal basis exists for levying charges based on the extra costs for O & M due to a project, but charges for all O & M costs on state irrigation projects should be levied on all farmers. This arrangement is probably unworkable in light of historical precedent.

Interpretation of the law does not have to be this broad. Simply, a recipient should be responsible for the repairs and maintenance of irrigation and drainage systems servicing his property, and be collectively responsible with all other recipients for the project's system, as a whole.

Government collection of charges for investment outlays require more justification in the eyes of farmers than simply the provision of the 1974 law. This justification can appear if one views projects as a Pareto improvement. That is, a change in economic organization that makes everyone

more economic reason for this action. A farmer may take out several loans from various sources at one time. Government loans carry only a 12-15 percent annual interest charge, while loans from relatives, money lenders, and landowners have a much higher interest rate. Naturally, the farmer would want to pay these latter loans back first.

better off--or at least, makes some better off without making anyone worse off.¹ The rationale here is that those who gain can and perhaps should in some way compensate those who did not benefit because they can do so and still remain better off. This implies that there are losers. And, it cannot be denied that some people do lose. Examples include those people in other projects whose budgets are reduced to permit financing the new project, and those people who have been promised a project, but who now must wait, thus being unable to fulfill hopes of improving their lives. Arguing from this point of view, government officials can show project beneficiaries that they are obligated to pay back some of the costs.

Often ignored are the overall redistributive effects of projects. Food supplies can be increased, thus lowering food prices or slowing price increases. Rural stability can be enhanced, thus reducing the need for military expenditures.

Actually the legal and economic arguments miss the entire question of equity and income distribution, which should be of special interest to the ALRO.² The intended audience of the land reform program has been defined as the landless, tenant, and small farmer. These people are already at the bottom of the income ladder. Rural development policy has not been oriented in their favor, as government officials tend to look at economic criteria, instead of the social criteria. Dollars do not always measure the true worth of a project.

¹Mishan, Economics for Social Decisions, p. 14.

²Since time and space are limited, the reader is directed to the following articles on income distribution: Udom Kerdpibule, "Distribution of Income and Wealth in Thailand," in Finance, Trade and Economic Development in Thailand; and Oey Astra Meesook, Income Distribution in Thailand, Discussion Paper No. 50 (Bangkok: Thammasat University, Faculty of Economics, 1976).

Project beneficiaries from private and public projects in other countries are normally expected to pay off project construction and investment costs. In Thailand, however, two arguments can be raised against assessing farmers for those investment outlays characterized as sunk costs. To summarize:

1. Charges have not been collected from beneficiaries in other projects. Many of these beneficiaries are in better financial positions to shoulder some of the costs.
2. The declaration of a land reform area and the resulting project are political decisions, which are not determined by the local population. Since the decision is made by the government, the government should bear the costs.

The legal basis for recovering investment tends to penalize some, while others are able for various reasons to avoid payment of this obligation.

Instead, the resource being supplied by the project should be treated as an input to production. Prior to project implementation, water was uncontrollable in the wet season and unavailable in the dry. Water will be controlled under the project and, in most cases, will be supplied in adequate quantities to insure year round cultivation. Without the water developments farmers would be no better off; with them they can realize an improvement in income. For this improvement they should pay for the inputs, just as they do with fertilizer.

The focus of cost-recovery can be shifted. Originally centered on government investment, the focus now looks at farmer investment. The farmer pays for the water he receives. If he does not pay, no water will be supplied. The payments made for water can be applied by the government against project investments. The basis for this charge will be water's share or contribution to the net value of production. Of course,

determining the amount of the charge is the purpose of this cost-recovery study.¹

One of the biggest problems in the absence of a well-defined land market is that of determining the fair value of land. At the present time, the Land Department of the Ministry of Interior has most of the information on land values used by government officials. This department uses buyer-seller transaction prices to determine land values. Since a title transfer fee of two percent of the sales price is collected a local land committee determines whether the actual selling price reflects the value of the land. Generally, an average of recent transaction prices in the area is used as a guideline.

Commercial banks use the land value listed at the Land Department, appraise the land themselves, and also ask local inhabitants the current local transaction price. The three values are added, and the average is used as the bank's value for loan purposes. Loans can be granted on up to 75 percent of this valuation. The bank purposely over values the price of land to allow for higher loans. It should be noted that buildings are valued very low, and contribute little to overall land values.

ALRO's method is similar to the banks, but includes an evaluation based directly upon the productive value of the land. First, land values are obtained from the Land Department. Second, the ALRO checks with the district office of the Land Department and administrative unit of the district office which handles the tax records for their opinion on the value of the land. Finally, the Land Reform Office evaluates the

¹The ALRO is in an unique position to incorporate in the project design measures to monitor the use of and collect for water use. If done now, many future problems and conflicts can be avoided.

property. This third value is obtained by multiplying the value of the crop grown by 2.5. These three values are added and an average (X) is computed. X reflects the value placed on the land. X also represents the value of the land which will be sold to project participants. It has been found that the ALRO computed land value tends to be lower than the other two values.

In its role as a buyer, the ALRO is at a disadvantage. Landowners, knowing that a project can only begin once all the land is acquired, hold out for a higher price. The power to expropriate does not even assure that the compensation price will reflect the true value of the land. Section 40 of the Land Reform Act allows the owner to petition to a Petition Committee and eventually to the courts (Section 42).¹ According to the law the process should take six months but it usually takes longer. Time problems together with uncertainties as to the courts upholding compensation offers can favor offers of higher purchase prices to avoid delaying the project.²

How does the buying process affect the selling process? Should farmers be expected to pay the same price at which the land was purchased, considering the purchase price may be higher than the actual value of the land? On this point, it could be argued that the compensation paid to private owners for purchased or expropriated lands should be viewed as a cost to government, rather than to the ultimate farmer who receives

¹Land Reform Act, Sections 40 and 42.

²Another reason for inflating the price offer for land was suggested by a few government officials and academicians. Many landowners are government officials or important businessmen. In dealing with the Land Reform committee, they are in a position to influence the compensation price in their favor. At this time there is no indication of this happening, but it may become a problem in areas where landowners show some belligerency in selling their land.

the land. The decision to compensate owners was a public decision. Since there was a stipulation that lands could not be taken without compensation, the ultimate responsibility lies with the government. Acquisition costs should be absorbed by the government. The value of land, which will be sold to the farmers, should be based on its net production value or opportunity cost.¹

Actually the whole process of selling land to project recipients may not arise. Farmers located on private, Crown, and public domain lands have the option of renting the land under long term leases, or purchasing the land. An economically rational farmer may opt to rent, for two very good reasons. First, the lease agreements are long-term and can be inherited,² though the land cannot be subdivided. Under the hire-purchase option, owners can only transfer land to their heirs or to the state (ALRO). In effect the land is non-transferable, and the owner is actually cultivating the land in his own or the state's interest. Basically there is little difference between renting and owning. Second, the government charges very little for renting project land. Rental rates for government land usually lag behind trends in productivity and in rental rates in the private market,³ or the rental rates are purposely set at a low level. At the Hupkapong settlement and other self-help settlements the farmers use the land free; at Khiri Khan settlement a fee of one Baht per rai is collected annually; in Changwat Chachoengsao, Miss Tipaporn reports that the Crown Property Bureau rented the land for about 25 Baht per year (she

¹Gittinger, Economic Analysis, p. 16.

²Land Reform Act, Sections 30 and 39.

³It should be pointed out that the Bureau of Land Management in the United States has never been able to collect market rates of rent for its lands.

did not indicate if this was per rai or for a 25 rai plot);¹ and the ALRO has found rental rates on Crown land in Ban Na, Nakorn Nayok to be between 5 and 25 Baht per rai.

Fair rental rates should be established. The net contribution of the land to production should equal its rental value,² since this measures its marginal value product. An appropriate means for determining land's contribution is through cost-recovery. In this report a fair rental rate can be determined from the value of production allocated to land. In addition, as the contribution of land to production increases, the report will be able to suggest when to make adjustments in the rental rate. This will help solve the problems arising from land prices which might not reflect the real value of the land.

Summary

A number of costs have been identified in this section, as being important in the analysis. Of particular importance are operation and maintenance, project development, and land acquisition costs. Historical precedent exists for recovering project investment costs. Many rural residents view government sponsored projects as gifts. Past performance indicates that it will also be difficult to collect operation and maintenance costs. The government has not aggressively collected charges to cover these costs nor do they have any established procedures to collect these charges.

With a poorly defined land market difficulties arise in accurately determining a fair market price of land in the project areas. Land sold

¹Tipaporn Lokaphadhana, "Economic Comparison of Broadcasting and Transplanting Dry Season Rice in Thailand" (unpublished Masters' thesis, Thammasat University, Bangkok, 1975).

²Gittinger, Economic Analysis, p. 16.

to protect participants should be based on its net production value, not on the purchase price paid by the ALRO. Certain equity and income distribution issues enter the discussion at this point and must be considered by the ALRO. Most project beneficiaries have little income and are not in a position to pay for over priced land. This factor should be remembered when arriving at a market price for land.

Project Benefits

Benefits are much more difficult to identify than costs. Project investments can generate secondary benefits outside the project, also associated with most projects are intangible benefits. Since some benefits are not obvious, and others present valuation problems, it is important to identify and distinguish between such concepts as tangible and intangible and private and public (social) benefits.

Tangible benefits reflect a market value placed on material products or services that result from a development or production process. Primary benefits are defined as the value of the immediate products and services,¹ or the increased value of output or reduced cost of inputs,² resulting from the project. Primary benefits are measured through the price mechanism in the marketplace. Thus, they can be valued and are classified as tangible benefits.

Secondary benefits result from activities stemming from or induced by a project.³ Increased employment in the transportation or food processing sectors generated by increased output from the project area would

¹Barlowe, Land Resource Economics, p. 209.

²Gittinger, Economic Analysis, p. 20.

³See Barlowe, pp. 209-10, or Gittinger, pp. 24-29 for more discussion on the concepts 'stemming from' or 'induced by.'

be considered secondary benefits. The question rises on how this type of benefit should be used in a project analysis. A handy rule of thumb is that "unless it can be shown that there is an increase in net incomes as a result of the project as compared with conditions to be expected in absence of the project,"¹ secondary benefits should not be considered in the analysis. Major secondary benefits can be measured and are considered to be tangible.

Intangible benefits are often difficult to measure in monetary terms. The U.S. Congress identified intangible benefits as: "Those benefits which, although recognized as having real value in satisfying human needs or desires are not fully measurable in monetary terms, or are incapable of such expression in formal analysis."² These benefits can rank among the most important derived from individual projects. Though no value is assigned to them in computational part of the analysis, intangible benefits will be acknowledged and considered throughout the analysis.

All benefits can be divided into two broad categories: private and social. Benefits accruing to project recipients are considered private benefits. Private primary benefits involve the increased production that results from development. Intangible private benefits come with better living conditions for the rural farm family. Social benefits are those benefits which accrue to the nation or public outside the project. These benefits can involve secondary benefits, such as creating new jobs or new small scale industries related to the project; or intangible benefits, such as allaying political unrest throughout the country.

¹Federal Inter-Agency River Basin Committee, Proposed Practices for Economic Analysis of River Basin Projects (Washington D.C.: Government Printing Office, 1958), p. 9.

²President's Water Resources Council, Policies, Standards and Procedures in the Formulation, Evaluation, and Review of Plans for Use and Development of Water and Related Land Resources, Sen. Doc. 97, 87th Cong., 2nd Sess., 1962, pp. 8-9.

One cannot escape the need for employing subjective value judgments in determining the benefits which will be counted in this study. Thailand's Land Reform Act does not contain a specific set of objectives. Nowhere does it specifically state that the intent of the land reform is to raise farmer income by promoting agricultural development projects. Enthusiastic officials in the ALRO have interpreted "assistance" to mean agrarian reform, and have centered their programs on improving rural welfare.

Private Benefits

The land reform projects are designed to aid farmers by insuring access to future income through improvements in their rights to land and through the initiation of agricultural projects in their behalf. The best approach for determining project returns to farmers is to employ farm management budgeting techniques, which calculate costs and returns at farm gate prices. This approach is also called a financial analysis. The best test to use in measuring returns and future income streams is the 'with-without' test, which compares income streams over time without the project and with the project.

Total returns to the individual. Actually the with-without test is computed on an input-output basis. Theoretically each physical input and output unit can be assigned an economic value, and the rule of diminishing returns can be applied. Thus the concept of total value product (TVP), can be introduced, and used to explain the input-output relationships.

If land is considered a fixed input and all variable inputs are lumped together in one unit, the marginal value product (MVP) can be determined. The MVP indicates the marginal return per input unit. Operators

with adequate variable inputs will attempt to produce at a point near where marginal factor costs equal MVP. The following diagrams illustrate these ideas.

Fig. V-1--Production Function

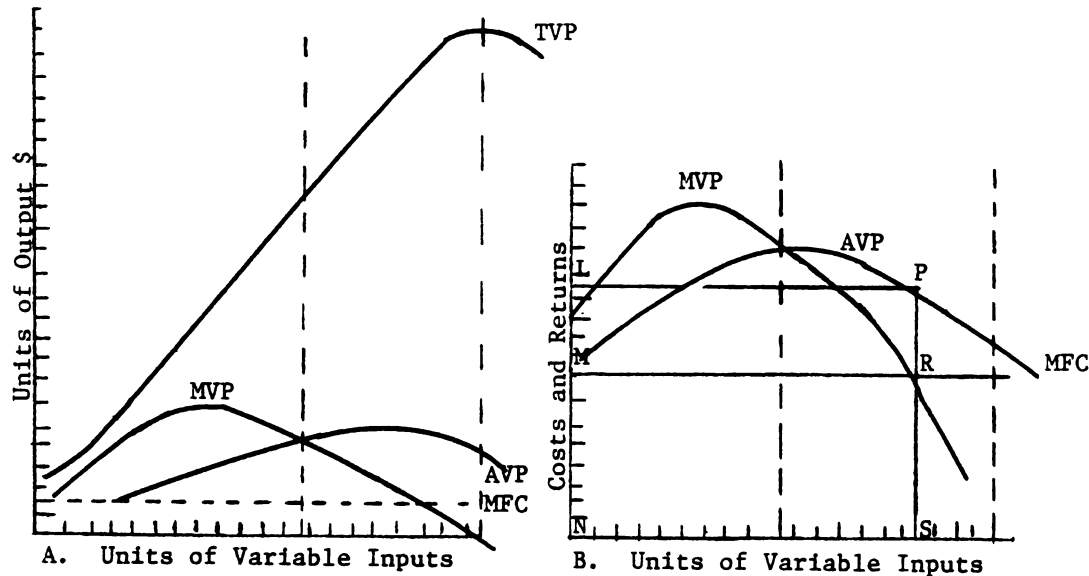


Figure V-1A shows that as an additional unit of input is added the TVP increases until a point is reached where output actually begins to decrease--the point of total diminishing returns. An operator will want to produce at a point where the difference between TVP and TFC (total factor cost) is the greatest. One should really focus attention on the relationships between marginal value products and marginal factor costs (MFC) and between average value products (AVP) and average factor costs

(AFC)¹ as the point of maximum spread between TVP and TFC always corresponds with the point at which a declining MVP = MFC.

Figure V-1B assumes the production function in A. In this diagram the operator will use S units of variable input and thus produce at the point at which MVP = MFC. The large area LPNS represents his TVP while total factor costs are represented by the area MRSN. The shaded area represents the returns above costs to the fixed factor, land.

Describing these curves at the farm level, TVP in Figure V-1A depicts the production function for rice produced during one season. The farmer will add inputs until he reaches his point of diminishing returns. In Figure V-1B this point is where his MVP = MFC. The shaded area reflects the total return to the individual above the costs of production.

In most cases it is difficult to take the theory directly to the field. Farmers have little knowledge on how to use certain inputs and are often unwilling to take the risks associated with the uncertainty of these inputs, especially if they have a poor resource base. Also there is the problem of securing the necessary inputs, even if the farmer wants to use them. Since the farmer has a limited supply of input factors, he will probably not be able to push production to the point of diminishing returns (MFC - MVP). Instead he will seek that point where his return is highest with the resources he has. Some economists would argue that this point reflects the opportunity cost of alternate uses for the inputs and if returns were below this point, the operator would shift to an alternative use. This is not necessarily true in every case. In Ban Na, some farmers will actually cultivate rice even if the expected harvest

¹Barlowe, Land Resource Economics, p. 130

might be zero.¹ Obviously there are no feasible alternatives which produce an economic value.

The calculations for the with-without test presented in Chapter VI are based on the concept of total returns. Total production is estimated, and multiplied by the value of one unit of production--giving the TVP. From the TVP factor costs are subtracted, leaving the returns to the farmer (land) above costs. This return is considered the primary benefit of the project. Later this figure will be used as the basis for the cost-recovery analysis in Chapter VII.

Social Benefits

Benefits accruing to the nation from a project can often exceed the benefits to the individual. Customs charges, the rice premium, dealer profits, and taxes are easily identifiable. Additional benefits are realized in increased food supplies and in employment generated in agriculture and agricultural-related industries. Intangible benefits also are important even though they are often overlooked by decision-makers. Included among the intangible benefits are items such as rural stability, stemming from increased rural prosperity; and alleviation of political unrest.

Difficulties arise in the quantification of social benefits and in adding them to private benefits. Some have obvious economic values, but others can only be mentioned in terms of social values. The following discussion briefly describes some of the social benefits generated by land reform.

¹This attitude was expressed in a discussion with the headman of village Ban Klong 30 in the Ban Na land reform area.

Rice premium, rice export tax and rice reserve requirement. Rice plays a predominant role among Thailand's crops in generating foreign exchange and producing government revenue. In 1974 rice generated 11 percent of total GDP or 33 percent of agriculture's share of GDP.¹ It is subject to a special tax arrangement known as the rice premium and also to an export tax.

Advocates of the rice premium argue that the premium acts as a price stabilizing tool, but actually it is a taxation on rice exports. The premium rate is fixed per ton but varies with the grade and type of rice exported. Although the rates have periodically changed the system has remained unchanged from 1955 through the 1970's.

The amount of government revenue generated by the rice premium, approximately 10 to 15 percent of total government revenues, remained stable between 1956-1966. Over the last ten years the premium's share of government revenue has dropped steadily. In 1965 the rice premium was 1,249 million Baht, 11.2 percent of total government revenue. By 1971 revenue generated from the rice premium dropped to 262 million Baht, 1.3 percent of total government revenue.²

Current government policy has reduced the rice premium on all grades of rice. Today the premium is levied only on the highest (best quality) grades of rice. The majority of rice being exported is unaffected by the premium.³ The export tax has been set by the Department of Customs at 10 percent of the market price for all grades of rice.

¹Figures from the National Income of Thailand, 1974-75 Edition (Bangkok: NESDB, 1975).

²Siamwalla, "A History," p. 151.

³Three controversial issues arise during the discussion of the rice premium: (1) Is the premium a useful tool in development strategy?; (2) What are the equity considerations?; and (3) What are the allocative and incentive

The rice reserve requirement stipulates that exporters must sell in the domestic market a fixed proportion of rice, of a specific grade, for each ton exported. Through certain outlets this rice is sold cheaply to the urban population. This requirement was recently dropped by the government, and no longer affects the rice price.

Land taxes and taxes on inputs. Land taxes are the source of revenue for local administrations. The tax rate varies according to the 'moderate' assessment value of the land.¹ Actually farmers pay very little in taxes. If the owner cultivates his own land, the maximum he pays is five Baht per rai, regardless of the land's value. A tenant is obligated to pay the tax on the land he rents. He pays the same rate as the owner.² A change in ownership pattern will not probably change total revenues, unless the rates are increased to reflect the true value of the land.

Inputs also generate national income through increased tariffs, business tax and municipal tax. The two important items to consider are fertilizers or rodenticides, but both are subject to a 1.5 percent business tax and a municipal tax (10 percent of the business tax). Taxes raise the overall prices of these items by about 1.84 percent from their dockside

effects of the premium? For discussion on these topics a few highly regarded sources are suggested. See: Chaityong Chuchart and Sopin Tongpan, The Determination and Analysis of Policies to Support and Stabilize Agricultural Prices and Incomes of Thai Farmers (Bangkok: Kasetsart University, 1965); Ingram, Economic Change, pp. 87-92, 243-61; T. H. Silcock, Economic Development, Chapter 1; Siamwalla, "A History;" Vois Narkswadsi, Farmer's Indebtedness and Paddy Marketing in Central Thailand 1957-58 (Bangkok: The National Research Office, USOM, 1970); and Dan Usher, "The Thai Rice Trade," in T. H. Silcock (ed.), Thailand: Social and Economic Studies in Development (Canberra: Australian National University Press, 1967).

¹For an explanation of 'moderate' assessment, see Land Taxation in Thailand Summary (Bangkok: Office of Agricultural Land Reform, 1975), (mimeographed).

²Bernard Colditz has prepared a paper for the ALRO (no title) on taxation in Thailand which he explains the agricultural land tax. Refer to Pamphlet 10 (Bangkok: ALRO, 1976).

price.¹ (This increase does not include domestic added costs for transportation and handling.)

Chemicals, such as pesticides and herbicides, are subject to a 5 percent import tariff and to the business and municipal taxes already mentioned. Approximately 7 percent of the dockside price is generated in revenue for the government.

Food supply. With good technical advice and needed inputs small farmers can produce yields as high or higher than large farm operators.² Through more intensive agriculture the food supply can be increased. Thailand now enjoys a food surplus, but additional supplies of rice are needed to insure that rice prices in Bangkok remain low. In addition, Thailand can use additional rice production to play a larger role in supplying food to hungry nations, thus promoting its export sector.

Keeping the cost of living down is important to the stability of the Thai government. Low level civil servants do not receive high wages, and for budgetary reasons the government does not want to raise the wages of this segment of the working class. Industry is still responding sluggishly, and labor cannot really afford to demand higher wages. Both civil servants and laborers can be placated if the price of rice, the major staple foodstuff, is kept low in urban areas.

Government officials generally fear that land reform will have adverse effects on the agricultural sector by causing a decline in output. Evidence does not support this contention.³ Poorly planned reforms can have drastic

¹Tipaporn, Economic Comparison, p. 112.

²Michiro Ichikawa, Fight for Asian Farmers (Tokyo: Asian Development Center, 1976), pp. 72-77, and 82.

³See Ichikawa, Fight, pp. 82-87, and Peter Dorner, Land Reform, Chapter 5.

effects in disrupting production patterns and result in less production. Carefully planned and implemented land reforms, however, can reduce uncertainties and bring increased agricultural production. Thailand will probably not face any disruption within the agricultural sector because of the initial limited scope of the land reform program.

Land reform should bring a strengthening of the small farm as a productive unit. The "average productivity of land and capital are higher on small holdings than on large."¹ Few studies are available concerning the relationship between land tenure and farm investment after reform.²

In nations such as Thailand, however, land reforms that will strengthen small farm agriculture often provide a major opportunity for making productive use of the large rural labor force that is and will continue to be available. Intensively used small farms can bring optimum use of the nation's agricultural land and labor resources and can provide marketable surpluses of farm products for export and for feeding the urban population.

Labor generation. If the population of a developing country is growing rapidly (around three percent a year), it is important that the different sectors of the economy be able to absorb new workers. Agriculture is the most important sector in Thailand. Some 80 percent of the population is classified as rural, and more than 60 percent of the population is engaged in full time farm work. Generation of employment in the industrial and non-farm sector lags far behind the actual expansion of the labor force.

¹Ichikawa, Fight, p. 84.

²Dorner, Land Reform, p. 114. Post reform studies in Costa Rica and Taiwan show a positive relationship.

Johnston and Kirby, have shown how long it would take in nations where agriculture is the residual employer for the majority of the labor force to be absorbed into the non-farm sector.¹ The movement depends on "the initial weight of non-agricultural sectors in the total labor force (L_a/L_t), the rate of growth of the total labor force ($L't$), and the rate of growth of non-farm employment ($L'n$)."² The table below shows two Johnston and Kirby examples--the earlyphasia, when 80 percent of the labor force is in agriculture and middlephasia, when 50 percent of the labor force is in agriculture--of the time periods needed for most of the labor force to shift non-farm employment.³

TABLE V-1

THE TURNING POINT IN SIZE OF
FARM LABOR FORCE

<u>Earlyphasia (Ln/Lt = .2)</u>				<u>Middlephasia (Ln/Lt = .5)</u>			
L't (percent):	3	2	1	L't (percent):	3	2	1
	(years required)				(years required)		
L'n (at 3%):	∞	123	26	L'n (at 3%):	∞	29	1
L'n (at 4.5%):	83	33	3	L'n (at 4.5%):	20	*	*
				*already reached turning point			

*already reached turning point

Source: Johnston and Kirby, Agricultural and Structural Transformation.

¹Bruce F. Johnston and Peter Kirby, Agriculture and Structural Transformation (London: Oxford University Press, 1975), p. 83.

²Ibid. ³Ibid., p. 86.

Thailand falls in the earlyphasia classification. From Table V-1 it appears that if Thailand's population continues to grow at three percent a year, more than 83 years will be needed to absorb the farm labor force. Even with a two percent average annual increase in population, labor absorption would take 33 to 123 years. The government hopes that the economy will expand at 8-10 percent a year. Johnston and Kirby point out that annual growth of the non-farm labor sector is slow, and never exceeds four percent for prolonged periods.¹ Government officials, therefore, must recognize that the agricultural sector will dominate the labor force for many, many years.

How can land reform improve employment opportunities? Bangkok is drawing people like a magnet from all over Thailand. Newspapers express the growing concern of the government over the steadily increasing number of unemployed, estimated to be about 1.4 million people. The government needs to encourage people to remain in the rural areas, but this can only be done through increased opportunities for employment, and insuring future streams of income. Later, as the industrial sector expands, workers can be slowly released to this sector.

Small farms tend to emphasize labor intensive methods rather than the capital intensive approaches used with mechanization. A strong case can be made for encouraging labor intensive methods in Thailand's agriculture.² Land reform, complemented by strong agrarian reforms, can

¹Ibid., pp. 84-85.

²See: Dorner, Land Reform, ch. 4; Carl Eicher, T. Falla, J. Kocher, and Fred Winch, Employment Generation in African Agriculture, Institute of International Agriculture, Research Report No. 9 (E. Lansing, MI: Michigan State University, 1970); B. F. Johnston and P. Kirby, Agricultural & Structural Transformation; Anthony Y. C. Koo, The Role of Land Reform in Economic Development: A Case Study of Taiwan (New York: Praeger, 1968); and "Land Reform in Taiwan," in AID Spring Review of Land Reform, Vol. 3 (12 vols.; Washington D.C.: U.S. Agency for International Development, 1970).

increase employment opportunities by altering agricultural cultivation patterns. A farmer who switches from monocropping to double cropping can use more labor throughout the year.

A program of this sort also generates jobs in the agricultural supporting industries. The need for factor inputs increases and more production brings expansion of the marketing sector. Work opportunities can be provided in manufacturing small mechanized equipment for labor intensive agriculture. The Japanese have shown that mechanization can be fitted to small farms.¹

How well a small farm system can absorb labor depends on a number of existing and potential factors. Dorner lists a number of variables, including present man-land ratios, existing land tenure arrangements, distribution of income, distribution of population through a country's agricultural regions, size and potential of the industrial base, and the dependence of the population on agriculture,² that can determine the potential for employment from land reform.

Another potential factor is the willingness of the government to invest in the rural infrastructure. Development implies better employment opportunities for a worker who wants to attain higher income and improved rural conditions.³ Land reform directly aides in this type of effort.

Rural prosperity, contentment and stability. Earlier it was shown that land reform insures the farmer access to future income, which

¹Dorner, Land Reform, p. 103.

²Ibid., p. 106.

³See: Y. Abt, Some Observations on the Lakhish Development Experience in Relation to Israel's Agriculture Cooperation with Developing Countries (Bangkok: ESCAP, 1976), (mimeographed).

contributes directly to his family's well being and even extends to the rural community. As a farmer's position improves he gains dignity as an individual and finds contentment with rural life. Definitely there is a much brighter future!

If land reform includes complementary community development programs, especially education facilities for youths and adults, the initial improvement in incomes will be sustained over a much longer period of time, instead of being only temporary.¹ As the welfare of the community improves, people, particularly the young people, are encouraged to stay on the farm or in the community, which slows migration to urban areas. As programs like this spread rural stability increases, creating favorable political institutions.

Prosperity lends itself to capital formation in other sectors of the economy. Farmers demand more simple consumer goods, particularly those produced within the country. This stimulates local industries to produce more goods. What actually emerges is new expenditure patterns which build upon the earlier transfers of income from tenants to landlords. The whole nation will thus benefit.

Political institutions. By generating individual and social well-being land reforms can make major contributions to the fostering of favorable political institutions.² Thailand is now working to improve its relations

¹In Taiwan farmers used much of their additional income to educate their children, feeling that education would insure the continuation of the families well-being, Dorner, Land Reform, p. 130.

²Barlowe, Land Economics, p. 530; Chaoyong Chuchart, Sixth Seminar on Village Defense and Development, Royal Thai Government, May 1976, Enclosure 5, Annex B; and for a review of Iran's land reform and its impact on political institutions see D. R. Denman, The King's Vista: A Land Reform Which has Changed the Face of Persia (Berkhamsted, United Kingdom: Geographical Publications, Ltd., 1973).

with neighboring countries. These countries, controlled by communist regimes, represent potential threats because of their encouragement of guerilla activities and conflicts in rural areas of Thailand. Unrest in the countryside has already been displayed in the form of farmers' complaints over a number of conditions. By encouraging programs of equal opportunity, the government can gain the continued support of rural workers, and allay political unrest.

Few officials will admit publicly that this is one, if not the major, objective of land reform.¹ Enactment of the Land Reform Act came as a result of demonstrations and political rallies in and outside of Bangkok. The permanency of the government hinges on its ability to avoid urban disorder, via violent demonstrations. By appeasing rural people, the government can pacify a large segment of the population. Though there is no way to place an economic value on political stability, the social and political implications of allaying political unrest are clear, and are of paramount importance to the government.

Problems with Benefits

This discussion of possible land reform benefits has been conducted in very broad terms. It is difficult to decide which of these benefits apply to an individual project area. The initial projects undertaken by the ALRO are small, ranging from 3,000 to 10,000 rai in size. The national benefits which will come from these projects will be very small. Only after the land reform program has expanded its projects, will aggregation of the results show significant national benefits.

¹Since the military backed government came to power in October 1976, officials have publicly stated that a major objective of the land reform program was to improve rural political institutions and allay political unrest. Acknowledging social goals such as these will aid the ALRO in carrying out its program.

Projects started in 1976-1977 will have little impact on food supplies and revenue generation for the government. For example, in Ban Na only 3,000 rai, out of a possible 16,000 rai, will come under development. Thus, individual benefits will be the only visible and measurable benefits. Even here, if the supportive service structure, providing extension education, marketing, credit, and production requisites, does not accompany land reform the results will be minimal.¹

Summary

Two basic types of benefits are generated by public projects. First are private benefits, or the improvement in income or quality of living for project beneficiaries. These benefits can be measured using a with-without test which evaluates the situation prior to the project and reviews what has happened after the project has been implemented. The difference is considered the primary benefits accruing to the individual.

Additional benefits are realized by the nation. These benefits can take many different forms, such as increased government revenue from the rice premium, land taxes and sales tax, increased food supplies, labor generation, and rural prosperity and stability. It is difficult to measure the value of some of these benefits because they cannot be formalized. Nonetheless, all benefits generated by a potential land reform project should be considered in its evaluation.

Criteria for Analysis

In this section attention will be focused on the criteria which will be employed in the following analysis. Knowing the criteria that will

¹Dorner, Land Reform, p. 112.

be used can contribute to one's understanding of the analysis and will also help with future reassessments and evaluations. Once the project begins, periodic assessments should be made to see if the project is proceeding towards its objective. Findings from reassessments can be compared to the findings of the original study. Over time, changing conditions ordinarily require adjustments both in project assumptions and criteria for analysis. It is perfectly permissible to alter the assumptions, during the initial study and subsequent reassessments, but these changes should be explicitly defined. If not, comparisons can lead to inaccurate conclusions and lead decision makers to select improper courses of action.

Insofar as this analysis serves as a guide for future evaluations of land reform areas, it can also provide a desirable function in assisting those who conduct such studies to understand the guidelines used with the original evaluation.

Benefits

Choice of specific benefits centers on which private and social benefits to consider. "The real social advantages of a more even distribution of land ownership are related in part to the fact that the economic rent that accrues to the owners of this scarce, nonreproducible resource is more widely distributed."¹ The major benefit is the improved income status of the landless, the tenant, and the small farmer within the project area. Farm management budgets can be used to determine the net incomes to farmers.

Direct and secondary benefits accruing to the nation will not be explicitly considered. Mention has already been made of the small scale

¹Johnston and Kirby, Agriculture, p. 165.

of the projects which will be started in 1977. The public will receive few recognizable benefits. Later, as the program is expanded, these benefits will become much more important. For example, over the next five years the ALRO plans to bring approximately 10-15 million rai under reform. An evaluator, who is analyzing the programme at the end of this period, can aggregate these benefits, thus, indicating just how many benefits accrue to the nation.

Actually these benefits cannot be overlooked entirely. Increasing use of fertilizers and chemicals and a rice surplus accrue benefits to the government via taxes. Logically one could say that these benefits can be applied against development costs. For analysis purposes, one could assume that 10 percent of the costs of development for one rai can be covered from these benefits. Later, when farmer response to new technological inputs and soil potential have been monitored, more accurate figures can be applied to the analysis.

Intangible benefits are extremely important. Rural stability could probably be the most important benefit of the land reform program. The analysis assumes that 25 percent of the development costs will be subsidized by the government who recognizes the intangible social benefits of land reform projects. Roughly 35 percent of the project development costs are assumed throughout this analysis to be charges that should be covered by public subsidy.

Costs

Throughout the analysis four types of costs will be assumed. These include: (1) farm production costs, (2) project operation and maintenance costs and land taxes, (3) rental or purchase charge, and (4) development

costs. Farm production costs will be handled by the individual farmer. Farm budgets can be adjusted to account for any increase or decrease in purchase of inputs or value of output.

O & M costs and land taxes are costs which cannot be avoided. Every recipient will have to share in the cost of maintaining the irrigation system. A fixed charge per rai will be applied in the cost-recovery analysis. Land taxes are a legitimate cost levied on the owner of the land and are ordinarily passed on to tenants as part of the contractual rental payment on leased land. For this analysis land taxes will be included in the rent paid by the tenant to the government. If a farmer opts to purchase land, once he has obtained title, he will be obligated to pay the land tax, which currently is five Baht per rai.

Some farmers will opt to rent land because of the security of tenure and the low rental rates associated with governmental properties. Rental rates can be based on the amount of income allocated to the land factor. This figure will be derived from the cost-recovery analysis. More than likely, rental rates will reflect more traditional levels. Certainly, farmers paying 13 Baht per rai for Crown land will be very unhappy if the rent increases drastically. For farmers purchasing land a similar rate can be determined, which will peg purchase payments to the land factor. In practice they may not vary significantly from the amount paid for rent.

The final costs to be considered will be project construction costs. These include the capital outlays for irrigation and other project development outlays less 35 percent which is an allowance for project benefits accruing to the nation. Repayment of these costs will take the form of a yearly water charge instead of charges for individual items.

Construction costs will be incurred in the development of:

(1) irrigation and drainage systems; (2) roads (only if it is for the exclusive use of the farmer, if it serves public needs the cost will be omitted); and (3) homes, if required. Costs for extending utilities, such as electricity, to the area will not be charged to the project resident. Hook-up fees to individual homes and user charges can be levied against the individual for these services. The administration costs of land reform will be absorbed by the government. A strong case can be made for passing the cost paid on government loans for project developments onto the land reform recipients. Throughout this analysis, however, it will be assumed that these costs will be borne by the government.

Water charges will be based on the returns to water, as a factor of production. Initially water charges can be credited to construction costs. After these costs have been covered, water charges can be used for other programs within the project area.

Production Assumptions

Various assumptions will have to be made concerning production conditions. Some assumptions will apply for both study areas, but local conditions warrant additional assumptions. All assumptions used in each project area are discussed prior to undertaking their respective analysis. Listed below are some of the more important assumptions.

1. The price of one kilo of non-gultinous paddy rice used in projecting incomes will be 2.2 Baht. This reflects an average nation wide maximum price which farmers can expect to receive in the future. In some areas the price is much lower such as in Ban Na where farmers have been receiving 1.6 - 1.8 Baht per kilo of non-glutinous paddy.

2. In areas which can support double cropping the cropping intensity will be 100 percent during the wet season, and 85 percent in the dry season after the fifteenth year of the project.¹
3. Initially rice will be assumed to be the only crop grown during both seasons in the Nong Sua project area, while vegetables will be raised in the Ban Na project area. Active research must be done to provide alternative crops for both wet and dry seasons. Possibly, new farming types will have to be introduced.
4. Farmers will be willing to invest in new techniques and inputs. This statement assumes that the government will provide the project farmers with the necessary agricultural services through a farmers' cooperative.

Project Assumptions

Other assumptions will have to be made concerning life of the project, discount rates, and interest rates. Several alternative levels can be chosen, and the different outcomes discussed among decision-makers before finalizing a course of action. Initial assumptions are:

1. The alternative assumption on length of the project for evaluation purposes will be 10, 15, 20, and 30 years.
2. Discount rates used will be: 8 percent, the rate of interest on government bonds used in acquiring land, and 10 percent the assumed opportunity cost of capital.
3. Interest rates will reflect the 8 percent rate, which the Bank for Agriculture and Agricultural Cooperatives (BAAC) charges cooperatives for short term production loans, 12 percent the cooperative lending rate, and 15 percent the commercial bank lending rate.

Further assumptions used in the cost-recovery analysis can be found in Chapter VII.

¹An assumed cropping intensity index of 1.85 appears to be rather high. An index this high was not even obtained under the intensive agricultural systems achieved in Japan and Taiwan. ALRO officials seem optimistic that they can obtain cropping intensities of 185 percent. A production goal this high can probably be attained in some limited areas. A more realistic cropping index would be a range of 1.35 - 1.50. Initial calculations will assume an index of 1.85. Later the analysis will look at lower index levels.

Opportunity Costs

Opportunity costs for land, labor and capital must also be considered. The opportunity cost for land is based on the revenue generated by the next best alternative. In the two study areas there is no current viable alternative to growing rice, due to soil and water conditions. Thus the opportunity cost of land is technically zero even though the land perhaps could be used for fish ponds or perhaps seasonal grazing purposes. After development the opportunity cost picture can change. Changes also will come with the introduction of new types of farming.

Labor also realizes an opportunity cost in revenues lost due to a change in farming methods. Farmers, who begin double cropping or must learn new techniques for growing alternative crops, may not be able to work in off-farm occupations. This loss of income may not be offset by higher income from increased crop production. The opportunity cost of labor can be viewed as the amount of off-farm income given up to participate in the project.

Opportunity costs for capital are viewed as the next best alternative for the capital outlayed for the project. In other words, other projects will have to be tabled to carry out land reform. The benefits of these alternatives are lost and become the costs of the project undertaken.

Instead of capital investment for land reform projects, the administrator may well consider direct cash transfers, subsidies, to poor farmers as a better means of achieving equality in rural areas. Subsidization also has its own opportunity costs.

Review of Criteria

This section briefly identifies the basic assumptions of the following analysis. Most benefits are assumed to accrue to the project beneficiaries.

Social benefits are generated and are accounted for via a public subsidy of 35 percent of project development costs. Costs include farm production costs, operation and maintenance costs, rental or purchase charges, and development costs, which have been reduced 35 percent. Costs, except for rental or purchase charges, will be recovered through the use of water charges.

Other important assumptions include the price of rice, which is slightly higher than what is actually being received. This shadow price reflects a compromise between the world price and the guaranteed price established by the government. Rice will be the principal crop, except in the Ban Na project area where vegetables will be grown. The project will have a life expectancy of 30 years, and a discount rate of 8 percent and the opportunity cost of capital of 10 percent will be used. These assumptions can be modified at any time should the situation change. All modifications should be just as explicit as the assumptions listed in this section.

Summary

Project costs, project benefits and the criteria for analysis were identified and discussed in this chapter. Project costs consist of farm production, operation and maintenance, project development, public utility, housing, land survey and titling, land acquisition, administration, opportunity, and interest costs. Farm production costs are borne by each individual farm. O & M and project development costs are recovered by charging farmers for the water resources provided through on-farm irrigation facilities. The government is assumed to absorb 35 percent of the development costs, reflecting the social benefits accruing from the project. All other costs are borne by the government.

Inclusion of land acquisition as a cost in the project analysis presents some difficulties for the analyst. First, the cost associated with land purchase is not a true investment cost, rather it can be termed a transfer cost from the government to the farmer. Taken in this sense, there is no new capital generated as there would be in an investment by the land from which costs can be recovered. Second, the value of the land being transferred is not necessarily related to the returns to land. During the bargaining between the government and the landowner a purchase price could be agreed upon which is much higher than the agricultural value of the land. In fact, this distortion is common in land markets world wide. For example, the present value of U.S. agriculture land is far above its present economic returns. These two points raise certain questions: (1) are farmers required to repay costs that are not directly related to project investments; and (2) if farmers do purchase the land, what is the appropriate price for the land? These are questions which will have to be answered in the political arena.

Project benefits accrue to both the individual and society, though it is often difficult to measure and place a value on society's benefits. Individuals will benefit through improved income and a better rural environment. Society receives increased revenue, more food supplies, and a stabler rural environment. Individual benefits can be determined using a with-without test. The next chapter deals with the with-without test. It focuses on the current farm budget and the farm budget envisioned after project implementation. The test and subsequent analysis will be conducted following the criteria established in this chapter.

CHAPTER VI

"WITH-WITHOUT" ASSESSMENT OF SELECTED LAND REFORM PROJECTS

The with-without test is a helpful method of identifying and examining the returns generated by a project. First, the agricultural situation in a designated area is examined without the project. This step is followed by a similar examination which measures the impacts of the project on the project beneficiaries. Additional impacts may be created which influence actors not directly involved in the project. These impacts can also be examined. In effect, the difference reflects the net additional benefits due to the project. This method allows the analyst to verify that the specific costs and benefits previously identified have been accounted for.¹ Not all the costs and benefits identified in Chapter V are listed in the with-without test--some are accounted for in the cost-recovery analysis in the next chapter.

Before conducting the with-without test, this chapter will cover the criteria used in selecting the study areas and the general setting and agricultural organization of each area. After setting down the existing conditions, the with-without assessment of the proposed projects will be carried out.

¹Gittinger, Economic Analysis, p. 15

Selection of Study Areas

All declared land reform areas through December, 1977 have been located on Map 4. The heavy black line traces the boundary of the fertile delta of the Central Plains. Notice only a few land reform areas are located near this region. The remaining areas are located on cut-over forest lands of the public domain or on marginally productive sites with poor soil and water resources. It is from this pool of land reform sites that two areas were selected for cost-recovery analysis.

The following criteria were observed in the study area selection process:

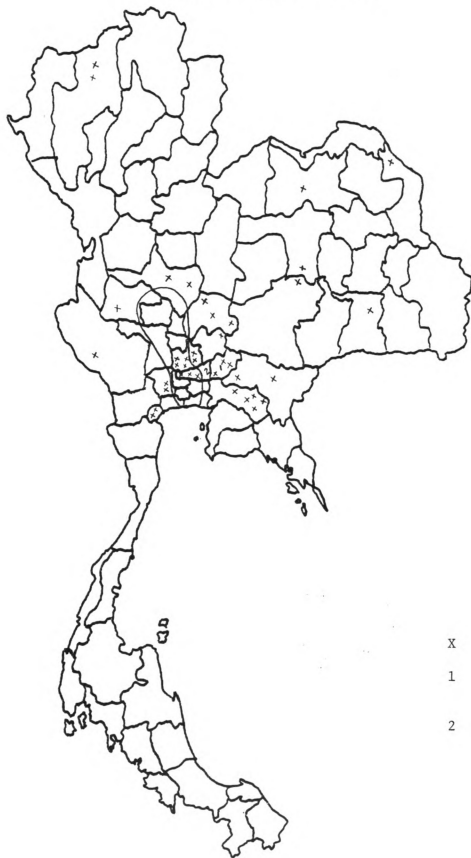
1. Study sites would have to be a declared land reform area.
2. Areas chosen should have a cadastral survey and socio-economic survey underway or finished prior to being selected.
3. Sites must be easily accessible to the author, as transportation was not always readily available.
4. Comprehensive development would be carried out in some form in each study location.
5. By request of the National Research Council project areas were to be as near to Bangkok as possible.

Three provinces were identified as having possible study sites:

Nakorn Nayok, Pathum Thani and Ayutthaya. Ban Na, Nakorn Nayok (number 1 on Map 4) was selected first because two socio-economic surveys and the cadastral survey were completed and the site was easily accessible from Bangkok. Lat Bua Luang, Ayutthaya was originally selected as the second study site, but was eliminated due to its relative inaccessibility and the questionable nature of some of the socio-economic data. Nong Sua, Pathum Thani was selected as the second study site (number 2 on Map 4).

Unfortunately, the two study sites are located near each other. Ban Na, Nakorn Nayok is a marginal area with acidic land and water resources,

Map 4
Location of Land Reform Areas



KEY

- | | |
|---|---------------------------|
| X | Land Reform Sites |
| 1 | Ban Na,
Nakhon Nayok |
| 2 | Nong Sua,
Pathum Thani |

bordering on the Central Plains. Though it is difficult to compare with other areas, many of its characteristics--poor soil, and insufficient water--are experienced in the Northeast and several other farming areas surrounding the fertile delta of the Central Plains.

Nong Sua, Pathum Thani also has acidic soils, but the agricultural potential for the area is much higher. Through proper development and management, this area can respond to the same degree as other high production areas in the Central Plains.

In reality, these two sites reflect two different situations: a marginal one and a highly potential one. They provide a good contrast for analysis and they highlight a number of problems which the ALRO will have to overcome in other project areas.

Project design for Nong Sua will incorporate the comprehensive development scheme. A sufficient water supply is available to insure double and possibly triple cropping in the area.

Problems have occurred with the project design in Ban Na. Originally plans were prepared calling for an irrigation scheme which could support a double cropping system. Water flow measurements indicated that there was not enough water for year round irrigation. Plans were modified to provide water control and supplemental irrigation for only the wet season. Because of the uncertainty of the water supply and the poor quality of the water, this modified plan proved unacceptable. In November 1976 the National Economic and Social Development Board (NESDB) submitted a new design. This design called for an intensive development of only three rai per family: one rai for home site and two rai for irrigated vegetable crops. Further development would be restricted to the Crown land pilot area.

General Setting

Nakorn Nayok and Pathum Thani are considered part of the southern Central Plains ¹ which is defined "as the wide and flat lowland area around Bangkok that stretches from the Gulf of Thailand as far north as Chainat and Takhli and from the terrace landscape near Ratchaburi, Nakhon Pathom, and Supan Buri in the west to the uplands and mountains of Chon Buri, Prachin Buri and Saraburi in the east."² Both provinces are located in the eastern section of this region.

Nakorn Nayok is drained by the Nakorn Nayok River. This river and its tributaries generally flood during the latter part of the rainy season. Flooding and poor drainage limits agricultural production to primarily rice. Where water can be controlled and is in adequate supply during the dry season, two crops of rice can be grown. When water cannot be controlled, broadcasting deep-water rice varieties is practiced. The highly acidic soils throughout this area are poorly suited for rice and other agricultural crops.

Pathum Thani is drained by the Chao Phraya River and tributaries of the Nakorn Nayok River. Water is seldom a problem because of the major canal system constructed and maintained by the Royal Irrigation Department which aids in water control. Even with the major canal development, few farmers have constructed on-farm irrigation systems. Without on-farm systems, the double cropping of rice is limited to a small area. Other

¹The Land Classification Division, Department of Land Development, has divided the country into eight major agricultural regions based on similarity of soils and of climatic conditions. These zones are not to be confused with the Department of Agricultural Economic's nineteen agro-economic zones.

²Land Classification Division, Soil Interpretation Handbook for Thailand (Bangkok: Department of Land Development, 1975), pp. iv-1.

crops also grow well in this area including upland crops, orchards, and flower gardens because the soils are less acidic than in Ban Na.

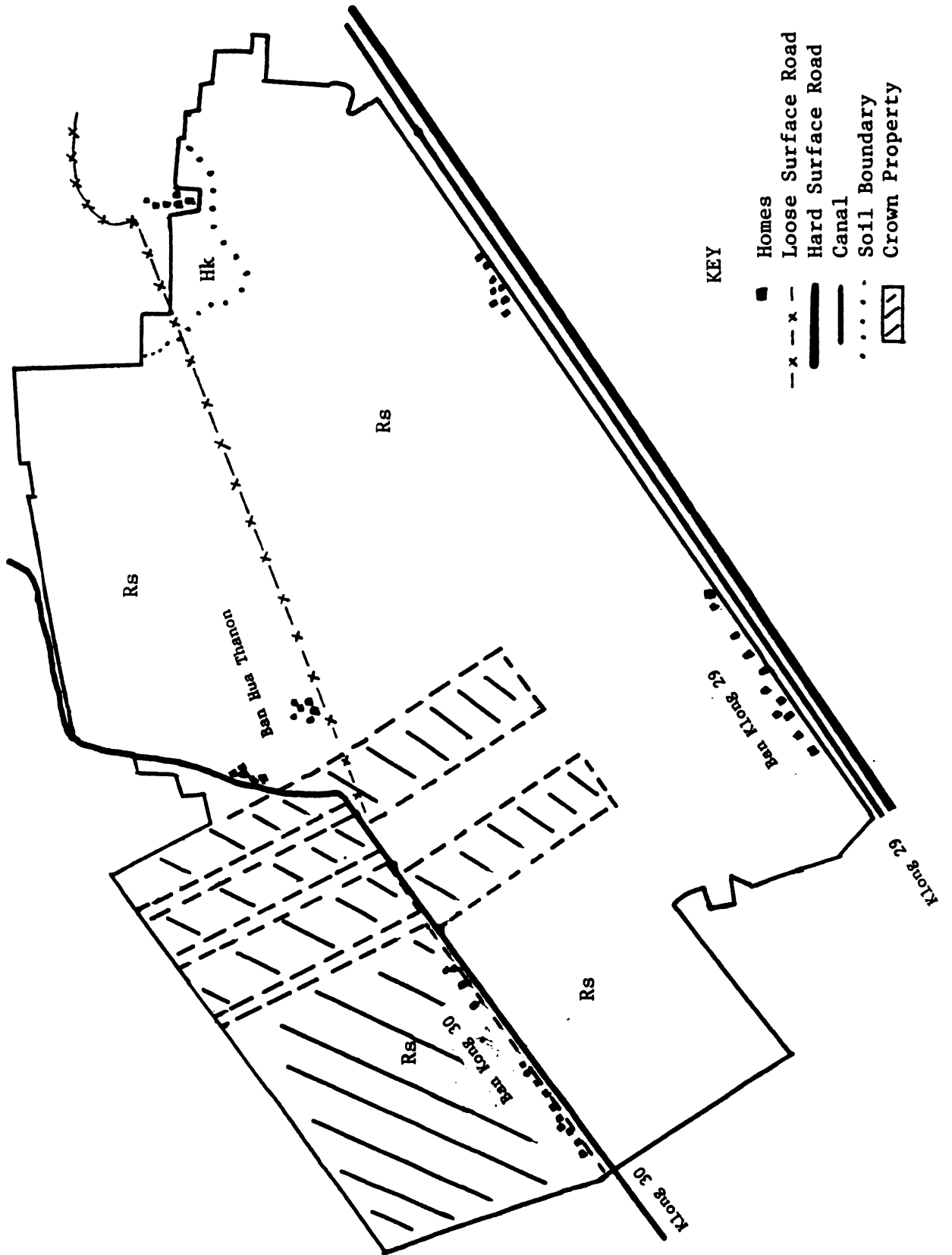
The Ban Na project area is located approximately 85 kilometers to the northeast of Bangkok. Located along the main hard surface road to the city of Nakorn Nayok, the study area is easily accessible by automobile. The declared land reform area comprises about 16,000 rai, of which 3,100 rai is Crown land (Map 5).

The Nong Sua project area is located in the eastern region of Pathum Thani, approximately 55 kilometers northeast of Bangkok and 30 kilometers from the Ban Na project site. The area is located about 12 kilometers north of the hard-paved road to Nakorn Nayok, and is accessible over a hard packed earthen road which presents some problems during the rainy season. That portion of the project area located along Klong Rapoeat can be easily reached by taking the superhighway to Saraburi and turning to the right at Wang Noi. The distance to this part of the area is about 90 kilometers. The declared land reform area comprises about 132,524 rai, of which 11,000 rai is Crown land (Map 6).

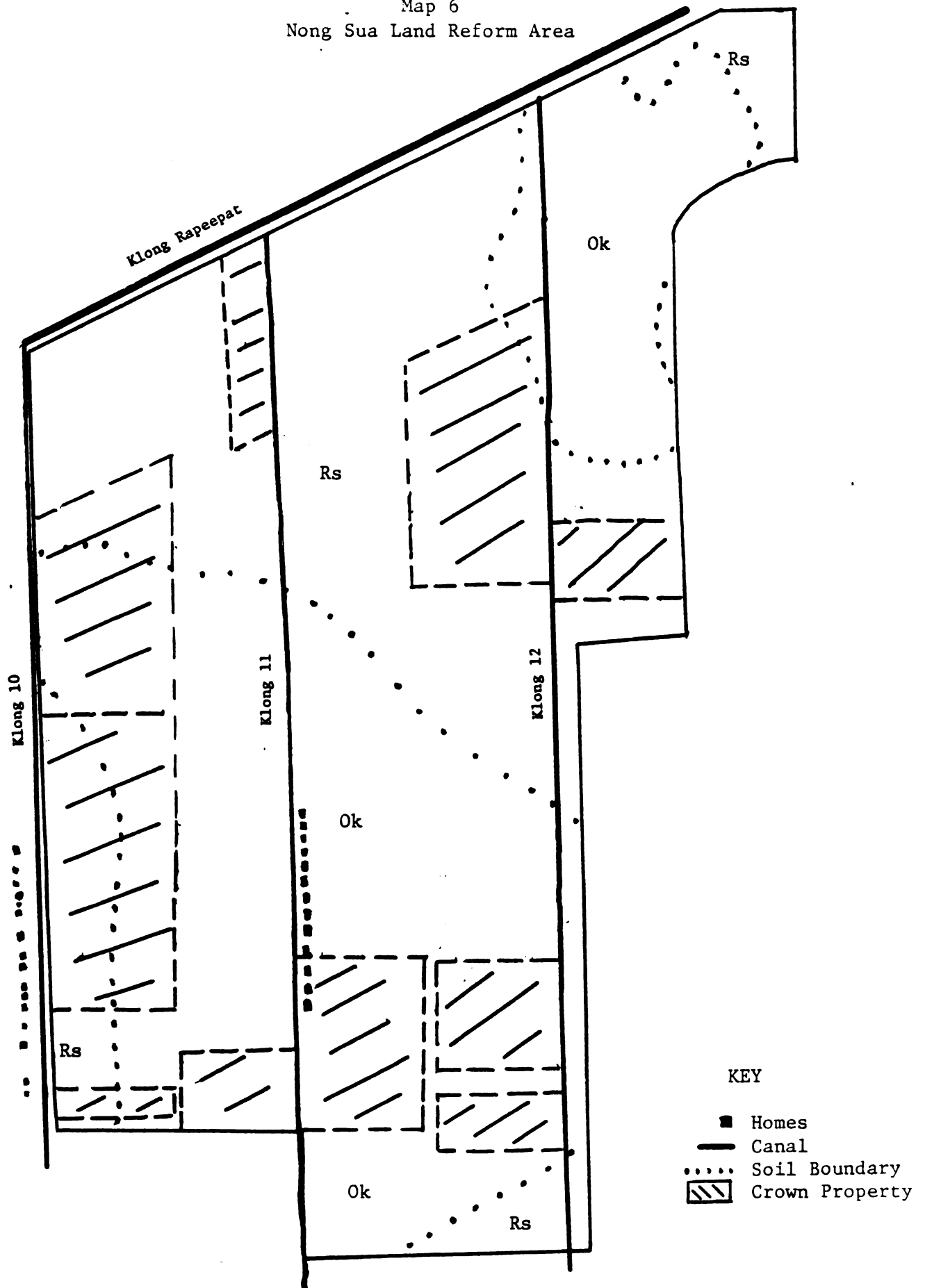
Natural Resource Base

Climate. This region has a distinct dry season from November through April, followed by the rainy season which begins in May and ends in October. Precipitation in the eastern section of the region is affected by the Khao Yai Highlands--annual rainfall often being over 2,000 mm. Relative humidity is high throughout the year. Though temperatures fluctuate, being coolest in December and warmest in April, the yearly average hovers around 28°C.

Map 5
Ban Na Land Reform Area



Map 6
Nong Sua Land Reform Area



The area's weather is affected by the Khao Yai Highlands. Table VI-1 indicates average monthly temperature ranges from a low of 25.6°C in December to a high of 29.5°C in April. Total average annual rainfall is over 2,000 mm. Total yearly rainfall has varied from a low of around 1,100 mm. in 1967 to a high of 2,800 mm. in 1957.

TABLE VI-1

METEOROLOGICAL DATA: MEAN MONTHLY AIR TEMPERATURE
AND AVERAGE MONTHLY RAINFALL FOR NAKORN NAYOK
AND EASTERN PATHUM THANI

Month	Temperature (°C)	Rainfall (mm)
January	25.8	6.3
February	28.1	28.6
March	29.1	31.3
April	29.5	81.4
May	29.3	200.0
June	28.3	281.1
July	28.0	310.0
August	27.8	366.6
September	27.8	356.5
October	27.8	210.5
November	26.5	33.3
December	25.6	17.6
Mean	28.0	Total 2,123.2

Source: Rainfall for 1957-1967 from the Statistical Reports of Changwat: Nakorn Nayok, National Statistical Office, Office of the Prime Minister; rainfall for 1968-1975 and mean monthly temperatures for 1971-1975 from Meteorological Division, Office of the Prime Minister. The Narkon Nayok meteorological station is the closest station to the Nong Sua district of Pathum Thani.

Soils. In Ban Na, there are two major soil types and two land forms. Rangsit Series soils are formed from brackish water deposits and occur on formal tidal flats. Hin Kong soils are formed from semi-recent alluvium and occur on flat terraces. Relief for both soil types is very flat with

slopes less than one percent. Nong Sua also has Rangsit Series soils and Ongkharak soils, which are quite similar.

Recent soil surveys by the Soils Division, Department of Land Development provide excellent information on soil conditions, especially in Ban Na. Map VI-5 (Ban Na) and VI-6 (Nong Sua) show the distribution of soil types. The Rangsit Series predominates in Ban Na, while the Ongkharat Series is most common in Nong Sua.

Based on selected pedons (soil samples), a short description of each soil series, including profile features, and drainage and permeability information, has been prepared from the Soils Division's comprehensive description. These descriptions provide necessary information for understanding current land use which can serve as a guide in planning development projects.

Rangsit Series (Rs): Soils of this series are mainly used for broadcast rice cultivation. This series is a member of a very fine clayey, kaolinitric, acid family. They are deep, extremely acidic (pH 3.5) soils. They drain poorly with permeability and runoff being slow. During the rainy season these soils are flooded to depths of one meter or more for periods of four or five months. In the dry season the water table falls one meter below the soil surface.¹

Hin Kong Series (Hk): Soils of this series are used primarily for transplanted rice cultivation. This series is a member of the fine silty mixed family of Low Humic Gley Soils (National), Aeric Paleaquults (USDA). They are deep, highly acidic soils (pH 4.0-5.5). These soils are somewhat poorly drained with permeability and runoff being slow. During the rainy season these soils are flooded to about 30 cm. for about four months. In the dry season the water table falls about two meters below the soil surface.²

¹Soils Division, "Rangsit Series (28)" (Bangkok: Department of Land Development, Revision 1971), (mimeograph).

²Soils Division, "Hin Kong Series (61)" (Bangkok: Department of Land Development, Revision 1971), (mimeograph).

Ongkharak Series (Ok): Soils of this series are mainly used for broadcast rice cultivation. In places where soils are too acidic for rice cultivation, rushes and sludges grow. This series is a member of the very fine clayey, kaolinitic acid family of Hydromorphic Alluvial Soils (Nationa), Sulfuric Tropaquepts (USDA). They are deep, and strongly acid soils. During the rain season these soils are flooded by river water to the depth of one meter or more. Drainage is poor, while runoff and permeability is slow. In the dry season the water table can drop one meter below the surface.¹

Land classification. The reason for classifying land is to show the value of land for some specific purpose. The Land Classification Division, Land Development Department, classifies land in six major categories. Of particular interest to this study are the land capability classification for upland crops and soil suitability classification for paddy (wetland rice). These two classifications are very similar except that rice is an important agricultural crop with different production requirements and it has been given special treatment.²

There are twelve basic assumptions underlying each classification.³ Two assumptions should be mentioned: (1) soils are placed in classes based on their existing conditions, not on potential improvements (only after improvements have been made will the soil's classification be changed); and (2) the system of farming is not considered to be highly developed, i.e., available capital is scarce, animals and tractors are used for land preparation, harvesting is done by hand, and fertilizer use is low.

Upland crop soils are grouped into eight classes. Classes U-I through U-IV are suitable for cultivation with limitations becoming more

¹Soils Division, "Ongkharak Series (34)" (Bangkok: Department of Land Development, Revision 1971), (mimeograph).

²Land Classification Division, Soil Interpretation Handbook, pp. VII-19.

³These assumptions are listed in Ibid., pp. VII-4, 5.

severe as U-IV soils are brought into use. Soils classified U-V through U-VII are not suited for cultivation of upland crops, but can be used as pasture land or rice. Category U-VIII should not be used for any agricultural purpose.

The determining factor in a soils suitability for rice is the availability of water. Therefore both water and land are considered together in determining suitability for a rice area.¹ Soils P-I through P-IV have enough water available and can retain water long enough to grow paddy. P-V soils are not suited to growing rice.

Each soil series is further classified into a subgroup according to its major limitation. The land classification for each of the major soil series has been briefly described with emphasis put on soil limitations.

Rangsit Series:

A. Upland Crop: U-Vf

Soils in U-V show no erosion hazard, but have other limitations which are extremely difficult to correct. The subclass (f) indicates that the characteristics of these soils as deep, level, poorly drained, clayey to loamy in nature, often subject to deep prolonged flooding. Costly land reclamation and flood control works would be needed to permit cultivation.

B. Paddy: P-IIla

Soils in this group are moderately well suited for paddy with moderate limitations. The subgroup (a) indicates that soil reaction is extremely acid (pH below 4) and the area is subject to prolonged flooding. Since the high acidity of the soil limits plant nutrients, heavy amounts of lime must be applied before fertilizers can be used. Due to the lack of water control rice is broadcast with yields being low.

Hin Kong Series:

A. Upland Crop: U-IVd

Soils in this class are poorly suited for upland crops, having severe limitations which restricts the choice of crops and requires careful management to produce cultivated crops. The major limitation is the high ground water table and

¹Ibid., p. VII-20.

surface flooding which occurs during the rainy season. These soils are too wet for upland crops in the rainy season.

B. Paddy: P-IIIs

Soils of this group are moderately well suited for paddy with moderate limitations. The unfavorable condition in this area is the shallowness, rapid permeability, and low fertility of the soil. Heavy fertilization practices must be followed to improve the soil. Rice yields tend to be low to moderate.

Ongkharak Series:

A. Upland Crop: U-Vf

These soils show no erosion hazard, but have other limitations which are extremely difficult to correct. The most serious limitation is the threat of deep prolonged flooding, because of the soil's poor drainage capabilities. Costly reclamation and water control works would be required to permit cultivation.

B. Paddy: P-IVa

Soils are poorly suited for paddy because of their poor drainage and high acid sulphate characteristics. Fertility is low because of the acidity, often below pH 4.0, which is difficult to correct.

Both project areas are faced with serious resource limitations. To improve agricultural conditions, water must be controlled and extensive land reclamation to correct highly acidic soils must be undertaken. Reducing acid soils with a pH range of 4.0 to 3.5 will be very difficult. Correcting higher pH's between 4.5 to 5.0 will be somewhat easier, but the results may not be spectacular. Regardless of what development project is undertaken, it should be kept in mind that it will be costly to overcome these resource deficiencies.

Human Resources

In the Ban Na project area, there are three small villages: Ban Klong 29 and Ban Kong 30, located along side canals, and Ban Hua Thanon, located next to the loose surface road (Map 5). There are two primary schools in

the area and no medical facilities, the nearest clinic is located in Ban Na about ten kilometers away.

The Nong Sua area is drained by canals 8, 9 and 10. The people live mainly along these canals and not in specific villages (Map 6). There are a few schools located in the area, but no medical facilities within the immediate project area.

Population. Population figures do not exist for the project areas. Population characteristics have been generalized from the Statistical Report of Changwat Pathum Thani and the Statistical Report of Changwat Nakorn Nayok from the National Statistical Office and the socio-economic surveys conducted by the ALRO.

The population of amphoe Ban Na has increased from 48,753 in 1967 to 53,291 in 1975,¹ approximately a 10 percent increase (1.4 percent per year). This should indicate either a very low birth rate or possibly out-migration from the area. The Statistical Report provides a profile of components of population change. Though the birth rate has exceeded the death rate by a rate of 24 per thousand, a steady out-migration of nearly one percent in Ban Na (higher since 1972) has almost negated the birth rate.²

The population of amphoe Nong Sua has increased from 26,042 in 1968 to 27,937 in 1972,³ or an increase of 1.4 percent per year. The birth rate has exceeded the death rate by a rate of 28 per thousand. During the early 1960's the growth rate was higher. In 1968-69, the yearly growth

¹These figures are from the Changwat Handbook, Governor's Office (in Thai).

²National Statistical Office, Report of Changwat Nakorn Nayok (Bangkok: NSO, n.d.), Table 1.10.

³National Statistical Office, Statistical Report of Changwat Pathum Thani (Bangkok: NSO, n.d.), Table 1.1 and Table 1.10.

rate was 2.2 percent, but between 1970-72 the growth rate was 1.4 percent. The reduction in growth rates can be directly linked to an out-migration which has increased steadily since 1969.

There are no explanations given for the slow growth and out-migration. It would be interesting to have a profile of out-migrants according to age groups. If younger members of the population are moving out, one could suspect that job opportunities in nearby Bangkok were attracting young family members. The limited availability of land and its poor quality could possibly account for some of the migration. Further demographic studies could bring out some rather interesting facts related to the area's land problems.

In 1970, Nakorn Nayok had a potential working population (age 11 and over) of 101,204 (59 percent of the total). Of this working group, 79,179 were considered to be economically active. The economic active workers were divided into two major groups: employed (43,032), and waiting for farm work (34,801). In this latter group, the largest percentage of workers were found between the ages of 11-19. The remainder of the working population, some 26,000 individuals, were considered non-economically active because they were housewives, students, or disabled.¹

Most workers consider themselves to be either an unpaid family worker or an own account worker. Only about 10 percent of the workers are employed by others and even fewer find employment with the civil service.

In 1970 Pathum Thani had a potential working population (age 11 and over) of 154,887 (61 percent of the total). Of this working group,

¹National Statistical Office, Nakorn Nayok, Table 1.6.

110,204 were considered to be economically active (71 percent). The economically active workers were divided into two major groups: employed (84,508) and waiting for farm work (22,335). As in Nakorn Nayok, the largest number of people waiting for farm work are found in the age group 11-19. The remaining 43,025 potential workers considered themselves economically inactive because they were housewives, students, or disabled.¹

The majority of workers (72 percent) considered themselves either own account workers or unpaid family workers. Some 7.2 percent of the people held civil service positions and 19 percent found employment in private industry. This latter may well be expected since there are a number of industrial sites located in the central and western parts of the Changwat.

Family size is approximately six members in Ban Na and almost seven members in Nong Sua. The larger families in Nong Sua may be explained by the larger size of net holdings found in this area. Type of tenure status does not appear to influence family size. Tenants in Ban Na have the smallest families, while Nong Sua tenants' have the largest families. Approximately 60 percent of the family members consider themselves to be full time agricultural workers (3.6 working members in Ban Na and 4.1 working members in Nong Sua). Table VI-2 summarizes the size of farm family according to tenure arrangement and size of holding. No information was available on the age of family head.

Education. Information on the education level in Ban Na farm families was obtained from the ALRO survey. The data showed that 34 percent of the people had not attended school or reached grade level 4, while 52 percent

¹National Statistical Office, Pathum Thani, Table 1.6.

had attained a level 4 education. Upon completion of level 4 a student is expected to be able to read and write at a minimal level. The remaining 14 percent have received more education, either at middle school, high school, or technical school.¹

TABLE VI-2
AVERAGE SIZE OF FARM FAMILY WITH FARM SIZE AND
TENURE ARRANGEMENT COMPARISONS

	Owner	Part-Owner	Tenant
Project Area: Ban Na			
Number of family members	121	181	166
Number of families	20	28	29
Average size	6.05	6.46	5.72
Average Net Holdings (rai)	32	59	38
Project Area: Nong Sua			
Number of family members	114	114	1,055
Number of families	18	19	148
Average size	6.33	6.00	7.13
Average Net Holdings (rai)	84	111	56

Source: ALRO socio-economic survey.²

The Statistical Handbook for Pathum Thani contained some interesting information on the literacy rate ³ by age group for the population older than 10 years of age. In 1960, 74 percent of the total population in

¹The data do not clearly describe the educational situation. It would be very helpful to have an educational profile based on age distribution and occupational pattern. This feature would lend to a better understanding of the farmers i.e., literacy rate among farm members of working age, and in deciding on educational objectives--special adult training courses.

²To avoid confusion in referring to the original data, it should be noted that two socio-economic surveys were conducted by the ALRO in Ban Na. The first was a survey of farmers throughout the amphoe and the second was a survey of farmers located in the land reform area. For purposes of this report, the second survey will be used unless otherwise noted.

³The handbook did not define what literacy meant or what was considered as a minimal standard for literacy.

Pathum Thani was considered literate (86 percent of the men, 62 percent of the women). As one would suspect, the age group 10-19 had the highest percentage of literates at 92 percent while in the population group over 65 years of age 28 percent were literate. In 1970, 84 percent of the total population was considered literate. Each age group showed a marked improvement in literacy except for the population over 60 years of age.

In the ALRO survey, evidence conflicts with the above figures. Twenty-four percent of the population have received no education and an additional 15 percent have not reached level 4. Fifty percent of the people have obtained a level 4 education while the remaining 11 percent have received more education primarily finishing level 7. Only one person in the survey had finished high school in the Nong Sua study area.

Occupational patterns. Farm family members consider themselves agricultural workers. Approximately 60 percent of the people in the Ban Na study area and 70 percent in the Nong Sua area are either own account workers or hired farm laborers. A few families are engaged in commercial interests, such as, small stores, or have members who hold civil service positions.

To supplement farm income, farmers make charcoal, fish, raise domestic animals, or seek non-farm employment, such as, carpentry. Because Bangkok is so close to these areas, many farmers find temporary employment during the dry season or slack periods in the wet season in the metropolitan area. At the present time, no data are available on the number of family members seeking employment in Bangkok and the types of jobs they fill once employed.

Land Use and Tenure System

Land use. The total Ban Na project area is 16,000 rai of which 3,100 rai is Crown land, as designated by the heavily outlined area in Map 5. Approximately 95 percent of the cultivated land, 15.120 rai, is in rice production, and the remaining five percent is used for livestock and garden crops. Rice is the only crop planted during the wet season. There is no agricultural activity during the dry season except for small melon patches, corn fields, and vegetable gardens belonging to farmers located near Klong Ban Na. About 736 rai, five percent of the project area, is used as home sites, schools, and wats.

The total area of the Nong Sua project is 100,000 rai, of which 11,055 rai is Crown land. The Crown land, consisting of several small units spread throughout the project area are designated by dashed lines on Map 6. The largest of these units is about 3,500 rai. The current land use pattern finds 95 percent of the land being used for paddy, three percent for house lots and two percent for other uses, such as, upland crops, orchards, and pasture. This means that within the project area approximately 95,000 rai is planted in paddy, 2,000 rai to other crops, and 3,000 for home plots.

Tenure system. Farm holdings have been classified according to size and tenancy pattern. Table VI-3 shows farm size distribution as it exists prior to any redistribution by the ALRO. The cadastral surveys have been completed for both areas, but the ownership maps could not be reduced to a size which would fit this report. Ownership maps are available at the ALRO.

TABLE VI-3
FARM SIZE DISTRIBUTION IN NUMBER OF FARMS

Farm Size	Owner		Part-Owner		Tenant		Total	
	No.	%	No.	%	No.	%	No.	%
Project Area: Ban Na								
0-25 rai	10	50	--	--	14	48	24	31
25-50 rai	5	25	15	53	6	21	26	34
50-100 rai	5	25	10	36	7	24	22	29
-100 rai	--	--	3	11	2	7	5	6
Project Area: Nong Sua								
0-25 rai	--	--	--	--	14	9	14	8
25-50 rai	7	39	2	10	66	45	75	40
50-100 rai	4	22	9	47	57	38	70	38
-100 rai	7	39	8	42	11	7	26	14

Source: ALRO socio-economic survey.

Average farm size in the Ban Na project area appears to be between 25-50 rai (approximately 38 rai). Only 31 percent of the farms are smaller than 25 rai, the rest are considerably larger. Over one-half of the under 25 rai farms are operated by tenants while two-thirds of the largest farms are operated by owners and part-owners. Table VI-4 indicates that part-owners rented two-thirds of their total net holdings.

In Nong Sua, average farm size is much larger between 50-100 rai (approximately 55 rai). Tenants tend to operate smaller holdings with about 54 percent of farm families below 50 rai. Sixty percent of the units over 100 rai are operated by owners and part-owners. Table VI-4 shows that part-owners rented slightly over 50 percent of their net holdings.

These farm sizes tend to be larger than in other areas of the Central Plains. ILACO reports that the average farm size in land consolidation

areas is between 12-20 rai.¹ Farm size can possibly be influenced by the poor quality of the resource base forcing farmers to cultivate larger areas in order to generate any marketable surplus. Early canal development in the Rangsit area also contributed to large land holdings (see Chapter II), especially in the Nong Sua project area. The ecology and the history of the areas have played an important role in establishing land ownership patterns.

Net land holding per family explains more clearly the distribution of land among farm families. There are three types of operators: (1) owner-operators, those who own all their land they work; (2) part-owners, those who own some land and rent the rest; and (3) tenants, those who rent all their land. There is also the situation where an owner allows someone to work a piece of land free-of-charge, usually a kinsman. The net land holding, shown in Table VI-4, is the amount of land a farmer actually works.

The net size of a farm rent in Ban Na is 44 rai and 64 rai in Nong Sua. Some interesting observations can be drawn from Table VI-4: (1) owner-operators rent out very little land, suggesting that absentee landlords own a large percentage of the land; (2) part-owners rent a significant portion of their net operation, 71 percent in Ban Na and 46 percent in Nong Sua; (3) a large percentage of the land being cultivated is rented, 67 percent in Ban Na and 79 percent in Nong Sua; and (4) part-owners have larger net holdings than the other operators. A wide disparity exists especially in Nong Sua in the size of holdings with those owning land in a more favored position.

¹ILACO, Chao Phya (sic) - Stage II, p. 237.

TABLE VI-4

AVERAGE LAND HOLDING, ACCORDING TO TYPE
OF OPERATOR (rai)

	Total Area	Owned	Rented Out	Allow to be worked free	Rented	Worked Free	Net Holding
Ban Na:							
Owner	34	33	2	0*	--	1	32
Part-Owner	63	20	3	--	43	0*	60
Tenant	38	--	--	--	38	0*	38
Total	46	16	2	0*	30	0*	44
Nong Sua:							
Owner	96	96	9	3	--	--	84
Part-Owner	119	56	7	2	61	2	111
Tenant	56	--	--	--	55	0*	56
Total	66	15	2	0*	51	0*	64

*Value less than one-half rai.

Source: ALRO socio-economic survey.

Tenancy. A number of studies have been made in Nakorn Nayok to determine the tenure situation. The 1964 land tenure survey of the Land Development Department included Nakorn Nayok, but the results were aggregated for all five provinces and no specific data for the province was reported. The 1967 study data were available on the district level, making it more useful for analysis. Table VI-5 has been extracted from the final report.¹ Over 90 percent of the farm families have to rent part or all of the land they cultivate. Approximately 70 percent of the families are tenants utilizing 59 percent of the tillable land.

Another survey completed in 1974 was carried out under the same format as the 1967 study using village headmen to collect

¹Land Policy Division, Land Tenure Situation, Tables 29 and 30.

the desired information, except it included all agricultural units. Eighty-four out of eighty-nine headmen in amphoe Ban Na cooperated with the investigators.

TABLE VI-5
LAND TENURE IN DISTRICT BAN NA,
1967

	Farm Families		Area	
	No.	%	Rai	%
Owner	43	6	2,639	9
Part-Owner	155	23	10,063*	32
Tenant	489	71	18,413	59
Total	687		31,133	

*The owner-tenants rent 5,419 rai or 52 percent of the land they till.

Source: Land Development Department, Land Policy Division

In analyzing information from this report some key definitions must be kept in mind: (1) a landlord is a person who usually does not operate his own farm but rents it out (does not include land in mortgage or land left idle); (2) a tenant farmer does not own any part of the land he tills; (3) an owner-tenant farmer rents some part of the land he cultivates; and (4) a landless farmer does not have any land to work and is hired as a farm laborer.¹

Data from this survey are difficult to use because information on the owner-operator has not been included in the survey. Table VI-6 has been extracted from the final report.

¹Land Policy and Planning Division, Agricultural Land Tenure Nakhon Nayok Province, 1974 (Bangkok: Department of Land Development, 1975), p. 6.

TABLE VI-6
LAND TENURE IN DISTRICT BAN NA,
1974

	Farm Households		Area	
	No.	%	Rai	%
Owner	2,086	44	94,334*	60
Part-Owner	417	9	20,754**	13
Tenant	1,235	26	43,035	27
Landless	1,031	21	---	--
Total	4,769		158,123	

*This figure has been extrapolated from the available data and may not be accurate.

**Part-owners rent 13,438 rai or 64 percent of the land they till.

Source: Department of Land Development, Land Policy and Planning Division.

No comparisons can be made between the 1967 and 1974 studies due to data discrepancies. One observation from the 1974 study should be noted: the high rate of landless farmers identified by the survey. It is unclear if these landless farmers lost their land or have been unable to acquire land for cultivation.

In 1975 the ALRO conducted a socio-economic survey of randomly selected farmers in the district and in the project area. The results from this study are shown in Table VI-7.

No trends or conclusions can be drawn from these studies due to the discrepancies in the data and the different methods used in conducting the surveys. One can make some speculations concerning tenancy in district Ban Na. Farm households operating as full tenants comprise between

20-30 percent of the total farm households and cultivate between 25-35 percent of the district's tillable land area. Part-owners make up 25-35 percent of the farm households and operate nearly 50 percent of the tillable land area of which approximately two-thirds is rented.

TABLE VI-7
LAND TENURE IN DISTRICT BAN NA AND
PROJECT AREA, 1975

	Project Area				District Ban Na			
	Farm Households		Area		Farm Households		Area	
	No.	%	Rai	%	No.	%	Rai	%
Owner	20	26	687	19	30	30	1,277	28
Part-Owner	28	36	1,755	49	50	50	2,386	52
Tenant	29	38	1,113	32	20	20	841	20
Total	77		3,555		100		4,504	

Source: ALRO socio-economic surveys for project area and district Ban Na.

The Pathum Thani Statistical Handbook contains 1963 data on land tenure, reporting 26 percent of the households as owner-operators, utilizing 34 percent of the cultivated area; cash and crop renters as 43 percent of the households, utilizing 42 percent of the cultivated area; and the remaining households as other holdings.¹ No definition was given to explain 'other'.

The Land Development Department's 1964 study did not contain any relevant data on Pathum Thani even though the province was surveyed. The first serious study was the Land Policy Division's 1967 study. This study reported that in Nong Sua 16, 9, and 75 percent were owner, part-owner,

¹National Statistical Office, Statistical Handbook, Table 2.2.

and tenant, respectively. Owners worked 17 percent of the cultivated area, owner-tenants--15 percent, and tenants--68 percent, as reported in Table VI-8.¹

TABLE VI-8
LAND TENURE IN DISTRICT NONG SUA, 1967

	Farm Families		Area	
	No.	%	Rai	%
Owner	427	16	30,266	17
Owner-Tenant	233	9	26,986	15*
Tenant	2,033	75	118,984	67
Total	2,693		176,236	

*Owner-tenants rent 13,541 rai or 50 percent of the land they till.

Source: Land Development Department, Land Policy Division.

The Land Policy Division recently completed a new land tenure survey of all agricultural units in the province. Provincial statistics show that 8, 6, 60, and 26 percent of the farm households are owners, part-owners, tenants, and landless, respectively. In district Nong Sua, 76 percent of the farm units are tenants who work 62 percent of the tillable land as shown in Table VI-9. Owners and part-owners make up 11 percent of the farm households and operate on 38 percent of the tillable land. Thirteen percent of the farm families consider themselves to be landless.²

¹Land Policy Division, Land Tenure Situation, Tables 43 and 44.

²Division of Land Policy and Planning, Agricultural Land Tenure Pathum Thani Province, 1975-1976 (Bangkok: Department of Land Development, 1977).

TABLE VI-9

LAND TENURE IN DISTRICT NONG SUA, 1976

	Farm		Area	
	Households		Rai	%
	No.	%		
Owner	166	7	48,138*	31
Part-Owner	89	4	10,467**	7
Tenant	1,834	76	96,483	62
Landless	311	13	---	--
Total	2,400		155,088	

*This figure has been extrapolated from the available data and may not be accurate.

**Part-owners rent 4,999 rai or 48 percent of the land they till.

Source: Department of Land Development,
Land Policy and Planning Division.

The ALRO's socio-economic survey reveals a similar land tenancy pattern. Table VI-10 shows that 80 percent of farmers are tenants, the highest of the three sets of figures.

TABLE VI-10

LAND TENURE IN DISTRICT NONG SUA, 1975

	Farm		Area	
	Households		Rai	%
	No.	%		
Owner	18	10	1,733	14
Owner-Tenant	19	10	2,269	19
Tenant	148	80	8,217	67
Total	185		12,219	

Source: ALRO socio-economic survey.

Even though comparison of these three sets of figures is difficult, it is surprising to find the drop in farm families and area between 1967 and 1976 since the Nong Sua area predominantly grows rice. A partial explanation may be found in the different survey methods. In 1967, only headmen of rice villages were interviewed. The 1976 survey contacted all village headmen not found in municipal areas, but some did not respond possibly biasing the sample. Also, employment opportunities in Bangkok and neighboring municipal areas may have encouraged some families to shift out of agriculture over the ten year period.

The high tenancy rates, reported in all three surveys, does substantiate the early historical record of the economic development of the Rangsit area as previously highlighted. The Land Policy and Planning Division reports that 72 percent of the absentee landlords who own land in Nong Sua live outside of the province¹ while in Ban Na only 13 percent live outside the province. Public policy concerning canal construction where large tracts were given as incentives has certainly affected the land tenure pattern of the Nong Sua area.

More detailed tenure information needs to be collected for both areas. Specifically, data concerning inheritance of property, ability of young farmers, tenants, and landless to move up the agricultural ladder to full ownership, and landlord-tenant relationships would be helpful in developing viable alternative solutions to the current tenure situation.

Rental arrangements. Tenancy per se may not be unhealthy even at levels as high as in Nong Sua and Ban Na if the rental arrangements are not extortionate. To improve the tenants' position the Land Rent Control

¹Land Policy and Planning Division, Agricultural Land Tenure Nakorn Nayok, Table 3.

Act was enacted setting the maximum rental rate at no more than one-third of the yield and establishing mandatory long term rental contracts, minimum length six years. This act was enacted in 1974. The ALRO socio-economic survey carried out in 1976 reveals the rental practices in the study areas. From this information, one can ascertain whether or not the tenants are being oppressed by excessive rental payments.

Table VI-11 shows the percentage of land under contract and the type of rental arrangements (cash or kind) found in both areas. Over 60 percent of the area rented did not have a contract. In the district-wide survey of Ban Na 73 percent of the families renting land did not have contracts. Breaking this figure down between part-owner and tenant reveals that 81 percent of the part-owners and 56 percent of the tenants do not have rental contracts. In Nong Sua 58 percent of the families do not have contracts, 79 percent of the part-owners and 55 percent of the tenants. The situation may not be as serious as the figures indicate because the number of families renting from kinsmen who would not necessarily give a contract is not known.

Rental payments in Ban Na are commonly made in-kind. The average in-kind payment is between 7-8 tang (70-80 kgs.) per rai, as shown in Table VI-12. Assuming a farm gate price of 1.8 Baht per kg., the market value of 70 kgs. of paddy is approximately 130 Baht or five times higher than the average cash payment of 20-30 Baht per rai. Payments of 70 or higher are above the legalized one-third maximum of 67 kg. per rai as reported in Table VI-14. It appears that 60 percent of the plots rented are paying more than is legally required.

TABLE VI-11

RENTAL CONTRACTS AND RENTAL ARRANGEMENTS

	Total Area Rented (rai)	% Rai under Contract	% Farmer under Contract	% Rai without Contract	% Farmer without Contract	% Rental Arrangement Cash Kind	
Ban Na:							
Part-Owner	1190	42	n.a.	58	n.a.	19	81
Tenant	1111	25	n.a.	75	n.a.	14	76
Total	2301	94	n.a.	66	n.a.	21	79
Nong Sua:							
Part-Owner	1166	28	21	72	79	53	47
Tenant	8212	52	45	58	55	55	45
Total	9378	40	42	60	58	54	46

Source: ALRO socio-economic survey.

TABLE VI-12

PAYMENT ARRANGEMENTS IN CASH AND KIND

Cash			Kind		
Rate Baht/rai	No. of plots	%	kg/rai	No. of plots	%
Project Area Ban Na					
0 - 19.99	3	30	0 - 29	9	19
20 - 29.99	4	40	30 - 39	1	2
30 - 39.99	-	--	40 - 49	2	4
40 - 49.99	1	10	50 - 59	3	6
50 - 59.99	-	--	60 - 69	4	8
60 - 69.99	1	10	70 - 79	5	11
70	<u>1</u>	<u>10</u>	80	<u>23</u>	<u>49</u>
Total	<u>10</u>	<u>100</u>		<u>47</u>	<u>100</u>
Project Area Nong Sua					
0 - 19.99	2	2	0 - 29	4	5
20 - 29.99	8	9	30 - 39	7	9
30 - 39.99	33	36	40 - 49	11	14
40 - 49.99	10	11	50 - 59	31	41
50 - 59.99	15	14	60 - 69	14	18
60 - 69.99	4	4	70 - 79	4	5
70	<u>19</u>	<u>21</u>	80	<u>5</u>	<u>7</u>
Total	<u>91</u>	<u>100</u>		<u>76</u>	<u>100</u>

Source: ALRO socio-economic survey.

Rental payments in Nong Sua, Table VI-12, are almost evenly split between cash and kind. The most frequently quoted rental rates in cash reange between 30-40 Baht per rai or over 70 Baht per rai. The mean was approximately 45 Baht per rai. In-kind payments average around 55 kgs. Assuming a farm gate price of 1.8 Baht per kig., payment in-kind correponds to a cash value of 99 Baht per rai, over twice the mean cash payment. The 55 kgs. per rai payment is below one-third the average yield of 75 kg. for two crops, see Table VI-19.

In both areas cash payments favor the tenant. Landlords who own storage facilities prefer in-kind payments because by storing grain he can realize a higher price in the future. Renters in Ban Na clearly pay higher rents than renters in Nong Sua. This is interesting because yields are higher in Nong Sua and this area shows more potential for intensive production. Overall, Nong Sua farmers seem to enjoy favorable rental payments.

The significant number of low payments in both cash and kind could suggest that those renting land from relatives and friends ask very low rental payments. In Chapter II, evidence was presented which supports this contention. Additional data needs to be gathered to determine if kinsmen actually receive preferential treatment in rental contracts.

An interesting rental procedure was revealed in an ALRO survey in the land reform area in Ban Na. Subinfeudation was found to be practiced on a number of Crown properties. There are three levels of tenancy involved in the subinfeudation process. The first tenant, called the Crown tenant, pays a rental rate of 12,570 Baht, and local taxes of 10,911 Baht, totaling 23,481 Baht, on 2,941 rai of Crown land¹ to the Crown Properties Bureau.

¹Figures obtained from Mr. Sirijit, Changwat Land Reform Officer, Nakorn Nayok.

The Crown tenant rents the land to the second-hand tenant, who may be a farmer, merchant, creditor, middleman, or local entrepreneur. No figures are available on what the second-hand tenant pays to the Crown tenant to rent the land.

The second-hand tenant rents the land to the third-hand who is the actual operator of the Crown land. Table VI-13 shows the rental rates paid by the third-hands. Converting the total rent in kilograms into Baht will show the difference between the original rent and the rent paid by the operator. The local farm gate price is about 1.8 Baht per kg. The value of the rice paid to the second-hand tenant is about 105,000 Baht or 4.5 times the original rental rate.

TABLE VI-13

THIRD-HAND RENTAL PAYMENTS ON CROWN LANDS

<u>Kg/rai</u>	<u>Rai</u>	<u>Total Rent (kg)</u>
50	459	22,950
30	243	7,290
20	182	3,640
10	<u>2,057</u>	<u>20,570</u>
Total	<u>2,941</u>	<u>58,450</u>

Source: Mr. Sirijit, Changwat Land Reform Office,
Nakorn Nayok

The second-hand tenant may be able to store the grain and realize a price of 2.0 - 2.2 Baht/kg when he sells. Using 2.2 Baht/kg as the selling price, the second-hand tenant could receive nearly 129,000 Baht, six times what the original Crown tenant paid to the Crown Properties Bureau. Storage capacity is the key to successfully accomplishing this course of action. In addition, the second-hand tenant must have the capital to finance the holdings of his stock.

There are no figures on how much the second-hand tenant keeps and how much he passes on to the Crown tenant. Though the rental payment by the actual operator is lower than the mean payment in Table VI-12, the profits earned by the Crown tenant are probably undeservedly high.

Agricultural Organization

Different cropping procedures are practiced in the two project areas. In Ban Na farmers can only cultivate one crop a year. For farmers in Nong Sua who are able to obtain water, two rice crops can be planted yearly. Yields and returns vary depending on the method used to plant rice and the operating costs associated with each method. To avoid confusion, each project area's agricultural practices will be examined separately in this section. During the discussion of agricultural support institutions, both areas will be looked at together.

Ban Na's Agricultural Situation

Cropping pattern. Two common methods of planting rice are practiced in the project area: the Na Wan Sam Ruay method, broadcasting dry seed on dry soil,¹ and the method of transplanting traditional rice varieties. Rice cultivation depends completely on natural conditions. With no facilities to control water, the area is subject to floods and prolonged periods of standing rain water. For these reasons, local long-stemmed varieties of rice are used by farmers. On the Crown lands where flooding is more pronounced, farmers can only follow the broadcast method. In other areas, farmers are able to transplant traditional rice varieties.

Cropping activities take place during the wet season. There is not enough water available for rice cultivation during the dry season. During

¹Lokaphadhana, Economic Comparisons, p. 27.

the dry season agricultural activities are limited to small garden plots on farm sites located along Klong Ban Na where sweet corn, peppers, and melons are grown.

Yields and returns. The average yield in the project area during the 1975 wet season was 209 kg. per rai. This yield was nearly 55 kilograms less than the average per rai for the district. In both surveys, the yield of owner-operators was higher per rai.

TABLE VI-14

RICE YIELDS IN 1975 WET SEASON FOR
DISTRICT BAN NA AND THE PROJECT AREA

	# of Families	Area Cultivated	Yield Total kg	Av. per rai (kg/rai)
District Ban Na:				
Owner	30	857	240,955	281
Part-Owner	50	2,132	536,490	252
Tenant	20	803	224,260	279
Total	100	3,793	1,001,745	264
Project Area:				
Owner	20	565	137,820	244
Part-Owner	28	1,576	320,415	203
Tenant	29	1,033	204,826	198
Total	77	3,174	663,061	209

Source: ALRO socio-economic surveys for District Ban Na and Project Area Ban Na.

The difference in yields between the project area and the district can be linked to the resource base. Acid sulphate soils are found extensively throughout the Changwat, but the acid concentration is much higher in the project area. The tenant farmers, cultivating Crown land in the northern portion of the project area, work the poorest soils (pH 3.5) and the water found in Klong 30 is of low quality and also highly acidic.

It is difficult to compare the project area with others, due to the differences in soils, water conditions, seed variety, and planting methods. The Nong Sua study area with the same soil types but less acidic reports similar yields during the wet season. In areas of the Central Plan region with better soil and water conditions, traditional rice varieties produce generally higher yields. Studies in the Chao Phya (sic) Irrigated Development project report average broadcast yields to be around 335 kilograms per rai.¹

Farmers receive a farm gate price of approximately 2.15 Baht per kg according to both surveys carried out by the ALRO. In the district survey the farm gate price range was 2.16 to 2.19 Baht per kg and in the project area this range was 2.07 to 2.2 Baht per kg. During personal interviews in May 1976, farmers said they were only receiving 1.8 Baht per kg. On June 30, 1976 The Nation reported that Ban Na farmers were receiving 1.6 Baht per kg. In later personal discussions with area merchants, the drop in the rice price was blamed on the poor quality of the rice because of its high moisture content. The rice price in this area has varied considerably over the last year. For computing the crop budgets, an average farm gate price of 2.15 Baht per kg will be used unless otherwise noted.

Operating costs. Before analyzing the crop budget for the project area, it would be helpful to review the production costs incurred by the farmer. In the ALRO survey, factor costs were divided into two groups. One group consisted of costs incurred in employing labor and plowing service either tractor hire or buffalo rental. The other group consisted of other production inputs such as fertilizers, pesticides, and herbicides.

¹ILACO, Chao Phya (sic) Project, p. 360.

Table VI-15 lists expenses for hired labor and tractor or buffalo hire services. The averages in these columns are derived by dividing total wages paid per activity by the total rai planted. It is questionable whether these averages can be used to infer relative wage rates in the cost-recovery analysis. More information is needed on hired labor costs and imputed family labor costs.

Table VI-16 lists expenses for other production inputs. The major input used, other than labor, is fertilizer. Since the other costs were statistically insignificant, averages less than one Baht per rai have not been listed in this table. No cost was incurred for seeds and organic fertilizers.

Table VI-15 provides some interesting insights into hired labor and plowing service transactions. Peak labor periods occur during harvesting when broadcasting rice, and during planting and harvesting when transplanting. On the average, 82 percent and 99 percent of the general costs for broadcasting and transplanting rice, respectively, can be assigned to peak labor periods. Contractual costs for renting water buffalo or hiring a tractor hire contractor for land preparation run about 15 Baht per eight hours and 40-100 Baht per rai respectively depending on the area. Average expenditures of 21 Baht per family would indicate that few families hire tractors for plowing.

In discussions with farmers within the project area, a general figure of 35 Baht per rai seemed to be the amount spent on hired labor per cropping season. A hired laborer generally throughout Thailand receives 55 Baht per rai for harvesting broadcast rice and slightly less for transplanted rice. The low expenditures for planting, weeding, and even harvesting would indicate that the labor requirements were usually met by family members. Farmers in the area tended to have two main reasons

TABLE VI-15

COSTS INCURRED FOR HIRED LABOR AND PLOWING
SERVICE IN WET SEASON, 1975 IN AVERAGE
BAHT PER RAI, AND AS PERCENTAGE
OF TOTAL COST

	Area Culti- vated	Soil Prep. Av.	%	Planting Av.	%	Weeding Av.	%	Harvesting Av.	%	Total Av.
Owner	565	23	42	9	17	0*	-	21	40	54
Part-Owner	1,576	20	36	12	20	0*	-	24	43	56
Tenant	1,033	22	37	7	11	0*	-	31	52	60
Total	3,174	21	37	10	17	0*	-	26	45	57

*Averages which are low tend to be meaningless. All these values were below an average one Baht/rai.

Source: ALRO socio-economic survey.

TABLE VI-16

COSTS INCURRED FOR OTHER PRODUCTION INPUTS IN
WET SEASON, 1975 IN AVERAGE BAHT PER RAI,
AND AS PERCENTAGE OF TOTAL COST

	Area Cultivated	Fertilizer Av.	%	All Others Av.	%	Total Av.
Owner	565	40	98	1	2	41
Part-Owner	1,576	30	94	2	6	32
Tenant	1,033	35	96	1	4	36
Total	3,174	33	95	2	5	35

Source: ALRO socio-economic survey.

for not using hired labor: (1) the cost of employing labor was too high, which was directly related to; (2) a shortage of labor during peak demand times. Some farmers mentioned that Bangkok had attracted many of the workers they had formally hired to plant and harvest rice.

Factor expenses, Table VI-16, point out that the major input used by area farmers is fertilizer. The average cost for fertilizer is between 5 - 5.5 Baht per kg at this distance from Bangkok. On the average a farmer uses about six kg per rai. Fertilizer applications are low in this area for two reasons: (1) crops do not respond to fertilizer applications on acidic soils; and (2) fertilizers cause the local grass to grow faster than the rice which severely reduces rice production.

Seed stock is maintained by retaining four percent of the season's harvest.¹ Other inputs not used by the majority of farmers will not be considered in crop budget discussion. (There were small expenditures in the "all other" category which can be attributed to the need for rodenticides to control a large influx of rats during the 1975 cropping season.)

Crop budget. An average project area farmer earns approximately 359 Baht per rai. Table VI-19 illustrates the crop balance sheet, assuming: (1) a farm gate price of 2.15 Baht per kg; (2) that fertilizer is the only non-labor input used; and (3) labor for weeding is provided by family labor. Total production costs are nearly 20 percent of the gross production value. This figure compares closely with findings in other traditional rice growing areas.²

¹This figure was obtained from the ALRO socio-economic survey for district Ban Na.

²See ILACO, Chao Phya (sic) Project, p. 242.

TABLE VI-17
AVERAGE CROP BALANCE SHEET FOR
PROJECT AREA, BAN NA

Item	Unit	Balance Sheet
Yield	kg/rai	209
Farm Price	Baht/kg	<u>2.15</u>
Gross Production Value	Baht/rai	449
Costs		
Soil Preparation	Baht/rai	21
Planting	Baht/rai	10
Harvesting	Baht/rai	26
Fertilizer	Baht/rai	33
Total Production Costs	Baht/rai	<u>90</u>
Net Production Value	Baht/rai	<u>359</u>

Source: Tables VI-15 and VI-16.

In Table VI-18, crop balance sheets have been prepared to see if there is a large difference in net production values between owner, part-owner, and tenant. The values used in this table have been taken from Tables 14, 15, and 16. The farm gate price of paddy rice is the average price each tenure group received as reported in the findings from the project area's socio-economic survey.

Returns to the owner are 28 percent and 20 percent higher per rai than the tenants and the part-owners respectively. Owners tend to use more fertilizer per rai than the other groups which could partially explain these higher returns. Less obvious reasons for higher returns, but not substantiated by the data, may be that owners cultivate better quality soil, use better seeds, or apply fertilizer with a higher nitrogen content. The owners appear to have a more favorable position in the market than

the tenants which could reflect the owners' ability to store grain for later sale or to seek out a rice trader who will pay a higher price.

TABLE VI-18
CROP BALANCE SHEET BY LAND TENURE FOR
PROJECT AREA, BAN NA

Item	Unit	Balance Sheet For		
		Owner	Part-Owner	Tenant
Yield	kg/rai	244	203	198
Farm Price	฿/kg	2.2	2.17	2.07
Gross Production Value	฿/rai	537	440	410
Costs				
Soil Preparation	฿/rai	23	20	22
Planting	฿/rai	9	12	7
Weeding	฿/rai	1	--	--
Harvesting	฿/rai	21	24	31
Fertilizer	฿/rai	40	30	35
Total Production Costs	฿/rai	<u>94</u>	<u>86</u>	<u>95</u>
Net Production Value	฿/rai	443	354	315

Source: Tables VI-15 and VI-16.

For the owner, 42 percent of his production costs goes for fertilizer, 26 percent for soil preparation, 22 percent for harvesting, and 10 percent for other labor costs. On these same items, the part-owner spends 35, 23, 28, and 14 percent respectively. The tenant allocates 37, 23, 32, and 8 percent respectively for these items. The owner spends about six percent more of his capital on fertilizer and he allocates less for labor costs than the other two groups. Production costs are 17, 20, and 23 percent of the gross production value for the owner, part-owner, and tenant respectively.

If the price of rice is the same for all operators, 2.15 Baht per kg the margin of returns to owner is reduced in favor of the tenant and part-owner. New figures would reflect that the owner would earn 19 percent and 20 percent more per rai than the part-owner and the tenant respectively. By keeping the price constant, the owner's higher returns can be attributed to use of more and better inputs and possibly a higher quality resource base upon which to cultivate.

Nong Sua's Agricultural Situation

Cropping pattern. Two cropping seasons are generally observed in this area. With water available during the dry season, farmers along the canals can grow rice twice a year. Lack of water control during the wet season forces most of the farmers to broadcast or transplant traditional local long-stemmed floating varieties of rice. In the dry season farmers are able to transplant improved local seed varieties (RD varieties approved by the Rice Promotion Board).

When engaged in double cropping, cropping intensities (how much land is cultivated each planting season) becomes important. The socio-economic survey revealed that of a total 11,513 rai designated as paddy 97 percent (11,213 rai) was cultivated in the wet season and 16 percent (1,857 rai) in the dry season. Breaking down cropping intensity by land tenure pointed out that those renting tended to cultivate more intensively than operators. This information can be found in Table VI-19.¹

¹There is no information presently available explaining why owners are leaving 14 percent of their paddy land idle. Labor shortages at peak labor times, late arrival of tractor hire services for land preparation, lack of seeds or fertilizer and lack of capital could all be possible reasons for not placing more land under cultivation.

TABLE VI-19

RAI PLANTED, CROPPING INTENSITY, AND
AVERAGE YIELD IN NONG SUA

	Rai Planted		Cropping Intensity		Average Yield kg/rai		Overall Average
	1*	2	1	2	1	2	
Owner	1,405	222	86%	14%	253	433	277
Part-Owner	1,995	349	92%	16%	257	415	281
Tenant	7,813	1,287	100%	17%	198	335	217
Total	11,213	1,858	97%	16%	215	362	236

*Number 1 refers to the wet season, and Number 2 to the dry season.

Source: ALRO socio-economic survey.

Yields and returns. Average yields during the 1975 wet season were approximately 215 kg/rai. Yields of this magnitude are nearly the same as in the Ban Na project area but not for district Ban Na (see Table VI-14). In Nong Sua, the yield obtained by part-owners were slightly higher than owner-operators.

By switching to the transplanting method and sowing improved seeds farmers' yields improved during the dry season. Average yields increased to 362 kg/rai. In fact, tenant yields nearly doubled. Unfortunately, the area devoted to dry season rice is small. Only farmers who can pump water out of adjacent canals can cultivate paddy during the dry season.

It is difficult to compare this area with others due to resource endowment and factor inputs. In other areas of the Central Plains, broadcast rice yields average about 355 kg/rai and transplanted local improved varieties yield about 520 kg/rai. These last two figures provide an approximate gage with which the Nong Sua area can be compared to other rice growing areas.

Farmers receive an average farm gate price for paddy rice of 2.09 Baht/kg. In the ALRO survey, the range of prices was 1.99 to 2.16 Baht/kg. The price of the paddy as reported in the survey is the average for both seasons. No distinction between wet season price and dry season price has been made in the survey results. In discussions with area farmers, the farmers generally felt they received a higher price for paddy during the dry season. No serious drop in the price of paddy has occurred here like in Ban Na. For computing the crop budget, an average price of 2.09 Baht/kg will be used unless otherwise noted.

Operating costs. Tables VI-20 and VI-21 refer to the average costs incurred for production inputs per rai in the wet season for broadcast and traditional transplant methods. Likewise, Tables VI-22 and VI-23 list the average costs incurred in dry season for transplanting improved high yielding rice varieties. Tables VI-20 and 22 list costs incurred for hiring labor and contracting plowing service for soil preparation. These figures were derived by dividing total amount paid for each activity by total rai planted. Tables VI-21 and 23 list the other costs incurred by farmers for inputs such as seeds and fertilizers. In Table VI-21 categories for organic fertilizer, insecticides, herbicides, and chemicals have been aggregated into one category, "all other," because the average values were so low making them statistically meaningless. For Table VI-23 the categories were not aggregated since the averages appear more significant.

During the wet season, hired labor costs for harvesting is the single largest expense averaging 48 percent of total cost for hired services. Combined costs for soil preparation and planting are also 48 percent of

TABLE VI-20

COSTS INCURRED FOR HIRED LABOR AND PLOWING
SERVICE IN NONG SUA, WET SEASON, 1975,
AVERAGE BAHT/RAI, AND AS PERCENTAGE
OF TOTAL COST

	Area Cultivated Rai	Soil Prep. Av.	%	Planting Av.	%	Weeding Av.	%	Harvesting Av.	%	Total Av.
Owner	1,405	17	15	24	22	9	8	60	55	110
Part-Owner	1,995	33	20	40	25	7	4	83	51	163
Tenant	7,813	17	29	14	24	1	2	26	45	58
Total	11,213	20	24	20	24	3	4	40	48	83

Source: ALRO socio-economic survey

TABLE VI-21

OTHER PRODUCTION COSTS IN NONG SUA, WET
SEASON, 1975, AVERAGE BAHT/RAI, AND
AS PERCENTAGE OF TOTAL COST

	Seeds		Fertilizers		All Others		Total
	Av.	%	Av.	%	Av.	%	Av.
Owner	8	14	48	83	2	3	58
Part-Owner	7	10	59	81	10	9	73
Tenant	6	9	55	87	3	4	64
Total	6	9	55*	85	4	6	65

*Average overall application was 10 kg/rai.

Source: ALRO socio-economic survey.

TABLE VI-22

COSTS INCURRED FOR HIRED LABOR AND PLOWING
SERVICES IN NONG SUA, DRY SEASON,
1975, AVERAGE BAHT/RAI AND AS
PERCENTAGE OF TOTAL COST

	Area Cultivated Rai	Soil Prep. Av.	%	Planting Av.	%	Weeding Av.	%	Harvesting Av.	%	Total Av.
Owner	222	35	22	81	50	0*	--	45	28	161
Part-Owner	349	41	14	78	27	10	3	162	56	291
Tenant	1,287	39	23	48	34	0*	--	53	38	141
Total	1,858	39	24	58	34	3	0	72	42	173

*Less than one Baht/rai

Source: ALRO socio-economic survey.

TABLE VI-23

OTHER PRODUCTION COSTS IN NONG SUA, DRY
SEASON, 1975, AVERAGE BAHT/RAI, AND
AS PERCENTAGE OF TOTAL COST

	Seeds		Ferti- lizers		Manure		Insect- icides		Herb- icides		Chem- icals		Others		Total
	Av.	%	Av.	%	Av.	%	Av.	%	Av.	%	Av.	%	Av.	%	Av.
Owner	2	2	93	93	--	--	3	3	2	2	--	--	--	--	100
Part-Owner	2	1	148	70	32	15	5	2	18	8	8	4	--	--	213
Tenant	8	5	150	86	0*	--	11		2	1	3	2	0*	--	175
Total	6	3	143**	83	6	3	9	5	5	3	4	3	0*	--	175

*Less than one Baht/rai

**Average overall application was 27 kg/rai.

Source: ALRO socio-economic survey.

total costs for hired services. These figures would suggest that some farmers are transplanting rice which calls for more soil preparation and hired labor to plant rice.

Fertilizer is the other major expense. Indications are that fertilizer applications are greater than 10 kg/rai on the farms applying fertilizer. Purchase of seeds is also a major expense for some farmers. Insecticides and herbicides are only used by a few farmers.

Expenses for owners and part-owners run to two to three times higher than for tenants. Since the average tenant holding is 57 percent as large as the part-owner and 30 percent as large as the owner-operator, it is possible to suggest that tenants are working the land more intensively substituting family labor for land. But, the lack of labor input data leaves this suggestion unclear. Tenants also appear to be substituting fertilizer for land to a greater extent than the other two groups.

During the dry season operating costs double or even triple. This reflects the shift to the transplanting of improved seed varieties which require the maintenance of a nursery plot prior to the actual transplanting of rice and increased fertilizer applications throughout the growing season. Planting requires additional labor as shoots must be transplanted in the puddled fields in clumps of three or four. The cost of transplanting is 57 percent of the general expenses for the owner and 27 percent for the part-owner. Tenants seem to rely more on family labor for transplanting rice as their average costs are much lower.

Hired labor is critically needed during the harvesting period to avoid heavy rains which would damage the crop and to clear the land in order to prepare the soil for the wet season's rice crop. The average

cost for hired labor during harvesting is approximately 50 Baht per rai. Part-owners appear to be paying three times that much. The differences in labor costs could be due to two factors: wage rates and variations in the amount of family labor used as a percent of total labor used in harvesting. If true, it would invalidate the statement that the relative wage rate for harvesting is 50 Baht per rai. Since no other labor data is available, the figures on harvesting costs found in Table VI-22 will have to apply in the following crop budgets.

Fertilizer use increases more than twofold, to 27 kg/rai, when transplanting. Varieties used during this period respond well to increased fertilizer applications. Notice should be taken of the wide use of organic fertilizers by part-owners. The use of insecticides and herbicides also increases.

Transplanting requires about 10 kg of seed per rai at a cost of about 25 Baht. The low expenditures for seed would suggest that only a part of the farmers use purchased seeds. The average from the cross-sectional data is not too helpful in this case. One should actually look at those who are purchasing seeds and see what the average expenditure is.

Crop budget. An average project area farmer earns approximately 700 Baht per rai a year: 300 Baht in the wet season and 400 Baht in the dry season. Table VI-24 illustrates the crop balance sheet assuming a farm gate price of 2.09 Baht/kg and the average costs found in the preceding tables. Total production costs are over 30 percent of the gross production value in the wet season and 45 percent in the dry season.

TABLE VI-24
AVERAGE CROP BALANCE SHEET FOR NONG SUA

Item	Unit	Wet Season	Dry Season
Yield	kg/rai	215	362
Farm Price	Baht/rai	2.09	2.09
Gross Production Value	Baht/rai	449	757
Costs			
Soil Preparation	Baht/rai	20	39
Planting	Baht/rai	20	58
Weeding	Baht/rai	3	3
Harvesting	Baht/rai	40	73
Seed	Baht/rai	6	6
Fertilizers	Baht/rai	55	143
Insecticides	Baht/rai	0*	9
Herbicides	Baht/rai	0*	5
Chemicals	Baht/rai	--	6
Total Production Costs	Baht/rai	<u>144</u>	<u>346</u>
Net Production Value	Baht/rai	305	411
Total Net Production Value for Two Seasons	Baht/rai		716

*Less than three Baht per rai.

Source: Tables VI-20, 21, 22, and 23.

Production costs in the wet season are allocated in the following manner: 40 percent to fertilizers, 27 percent to harvesting, and 13 percent to both planting and soil preparation. The distribution of costs during the dry season is similar, as 41, 21, 16, and 11 percent are appropriated for fertilizers, harvesting, planting, and soil preparation respectively. Farmers' net income increases by about 100 Baht per rai in the dry season.

Table VI-25 presents the crop balance sheet by land tenure classification. For this example, the price of paddy will be the average farm

gate price each group received as reported in the ALRO socio-economic survey. Total net production value tends to range between 650 and 950 Baht per rai with owners having a higher return per rai than the other groups. The net production value for the wet season show returns to owner to be 10 percent higher than the tenants, and slightly higher than part-owners. In the comparison of costs, owners and part-owners tend to have higher costs specifically for hired labor activities. As was mentioned in the previous section, it appears that tenants are substituting labor for land and as a result working their land more intensively. There is no evidence in the data to help explain why tenants yields are 20 percent lower than the other groups.

There is a large difference between net production values by tenure group during the dry season. The owners earn approximately 35-40 percent more per rai than part-owners and tenants. Owners appear to operate at a much lower cost per rai, nearly 50 percent less than part-owners. One noticeable difference is the amount spent on fertilizers--owners spending 30 percent less than the other groups. Owners' yields are also higher per rai. One can only speculate on the reasons for these differences. Such factors, as type of fertilizer, choice of seed variety, and quality of soil could cause the divergence between operators.

Credit

Working capital for most farmers comes from credit obtained prior to the cropping season. It is often difficult to determine what credit will be used for. Table VI-26 presents the reasons given by farmers for seeking credit.

The majority of credit, about 60 and 50 percent in Ban Na and Nong Suay respectively, is used to meet current production needs, such as,

TABLE VI-25

CROP BALANCE SHEET BY LAND TENURE FOR NONG SUA

		Balance Sheet For		
		Owner	Part-Owner	Tenant
<u>Wet Season</u>				
Yield	kg/rai	253	257	198
Farm Price	฿/rai	1.99	2.16	2.09
Gross Production Value	฿/rai	492	555	414
Costs				
Soil Preparation	฿/rai	17	33	17
Planting	"	24	40	14
Weeding	"	9	7	0*
Harvesting	"	60	83	26
Seed	"	8	7	6
Fertilizer	"	48	59	55
Insecticides	"	0*	0*	0*
Herbicides	"	0*	0*	--
Manure	"	--	--	--
Chemicals	"	--	0*	0*
Total Production Costs	"	<u>166</u>	<u>228</u>	<u>19</u>
Net Production Value	฿/rai	326	326	293
<u>Dry Season</u>				
Yield	kg/rai	433	415	355
Farm Price	฿/kg	1.99	2.16	2.09
Gross Production Value	฿/rai	862	896	700
Costs				
Soil Preparation	฿/rai	35	41	39
Planting	"	81	78	48
Weeding	"	--	10	0*
Harvesting	"	45	162	53
Seed	"	0*	0*	8
Fertilizer	"	93	148	150
Insecticides	"	0*	5	11
Herbicides	"	0*	18	0*
Manure	"	--	32	--
Chemicals	"	--	8	0*
Total Production Costs	"	<u>254</u>	<u>522</u>	<u>309</u>
Net Production Value	฿/rai	608	374	391
Total Net Production Value	฿/rai	934	700	684

*Average less than three Baht/rai

Source: Tables VI-21, 22, 23 and 24.

purchasing fertilizer and hiring workers. These loans are usually repaid immediately after each cropping season with the rice crop serving as a guarantee against default.

TABLE VI-26
PURPOSE OF CREDIT

	% Production	% Long Term Investment	% Consumption	% Debt Repayment
District Ban Na:				
Owner	45	20	35	--
Part-Owner	60	13	25	2
Tenant	70	--	30	--
Average	59	12	28	1
Project Area Nong Sua				
Owner	69	23	8	--
Part-Owner	45	27	14	14
Tenant	47	29	19	5
Average	47	29	18	6

Source: ALRO socio-economic survey.

A higher percentage of the credit is going for long term investment purposes in Nong Sua than in Ban Na where tenant farmers seem to be able to obtain long term loans. This is truly significant as tenants usually do not pursue ventures with long time frames when their duration of tenure is uncertain. There is no available information on what type of projects farmers are undertaking. On one visit to the land reform area, two owners were constructing canals and moving land for orchards. On another visit, the author met a young tenant who had been given a fifteen year lease for 12 rai, which he converted into an orchard. (His source of loan was outside the institutional lending market.) Other possible

long term investments could be the purchase of small tractors or water pumps. Long term loans are usually paid back in three to five years. In most cases, land serves as the collateral.

The remaining portion of the credit, 28 percent in Ban Na and 18 percent in Nong sua, is used to meet family consumption needs until the rice crop has been harvested. Some of this money is probably used to finance religious ceremonies, weddings and other festive occasions. Critics of expanding rural credit argue that much of the credit supposedly used for production purposes is actually used for consumption. Available data do not provide any information to support this claim as most of the credit obtained by these farmers goes toward production.

One of the biggest complaints of farmers is the lack of credit. Farmers can obtain loans from institutional sources which include private sector commercial banks, cooperatives, farm associations, and the BAAC, or from non-institutional sources, such as, merchants, relatives, neighbors, and landlords. Institutional sources have limits over which a farmer cannot borrow. Often the farmer does not receive enough to meet production costs especially in a more intensive agricultural situation. Other credit sources have to be found among merchants, relatives, and neighbors. Institutional sources supply 53 percent of the credit needs in the Ban Na project area, Table VI-27. The BAAC lends directly to farmer associations and cooperatives for short term purposes and to individual farmers who need long term loans. A cooperative lends directly to its members who are required to own land and shares of stock in the cooperative. Some tenants were allowed to borrow but at slightly higher rates. Many tenants have joined together in farmer associations to facilitate getting credit. Non-institutional sources supply 47 percent

of the credit needs. Relatives provide 16 percent of the total loans and merchants and neighbors provide another 31 percent.

TABLE VI-27
SOURCE OF LOANS

	BAAC	Farmer's Associa- tion or Co-op.	Merchant	Relative	Other*	Total
Project Area Ban Na:						
Owner	1	8	1	2	3	15
Part-Owner	5	4	1	2	6	18
Tenant	5	7	1	5	6	24
Total	<u>11</u>	<u>19</u>	<u>3</u>	<u>9</u>	<u>15</u>	
Percentage	53		47			
Project Area Nong Sua:						
Owner	8	1	8	2	n.a.	19
Part-Owner	7	1	7	3	n.a.	18
Tenant	55	2	79	12	n.a.	148
Total	<u>70</u>	<u>4</u>	<u>94</u>	<u>17</u>	<u>n.a.</u>	<u>185</u>
Percentage	40		60			

*Other sources include neighbors, village headman, and farm owner.

Source: ALRO socio-economic survey.

These percentages compare quite closely with the figures obtained from the ALRO's district survey. In this survey, 51 percent of the loans were received from institutional sources, and 49 percent from non-institutional sources. Within the non-institutional sources, there are some interesting comparisons. In the project area, merchants are the source of only six percent of the loans. In the district, however, they provide 13 percent of the credit. On the otherhand, 12 percent of the credit in the district comes from relatives while in the project area relatives are relied on for 16 percent of the credit needs.

Table VI-27 shows that 40 percent of the loans in Nong Sua come from institutions. Non-institutional sources provide 60 percent of the loans. Merchants are the largest single source of loans, over 50 percent. The BAAC and private commercial banks supply 37 percent. Cooperatives play only a very minor role in the area. Relatives provide the remaining 10 percent.¹

How much do farmers borrow? Table VI-28 summarizes the debt situation of the project area farmers. The average size of loans taken out per farm family is about 6,800 Baht which is approximately one-third their total income.

TABLE VI-28
AMOUNT OF LOAN IN BAHT FOR
PROJECT AREA, BAN NA

	Number taking loans	% of Farm Families	Av. Amount of Loan	Av. Amount Repaid	Av. Outstanding Debt
Owner	13	65	6,805	2,077	4,728
Part-Owner	16	57	9,156	3,188	5,968
Tenant	21	72	5,167	2,167	3,000
Overall Average	50	65	6,780	2,470	4,400

Source: ALRO socio-economic survey.

The survey does not break down the total amount of loan into repayment periods, making it difficult to determine when the loan is due. The survey was conducted in January 1976 just after harvesting of the 1975 wet season crop. The amount repaid could be for the money borrowed for production inputs at the beginning of the cropping season. The remaining outstanding loan could be for current consumption needs until the rice

¹The author talked to only a few farmers in this area, both indicated tight institutional credit and both received all their credit from family members.

crop is sold, purchasing inputs for the next season, and, in the case of some owners and part-owners, long term investments.

Over half the farmers indicated they were paying 12 percent interest on their loans. Approximately one-third paid higher interest rates and only a tenth received loans below 12 percent.¹ The BAAC lends money to member cooperatives and farmers' associations at an interest rate of 8 percent. The cooperatives and farmers' association in turn lend to their members at an interest rate of 12 percent. The BAAC will lend directly to owner-operators at an interest rate of 12 percent for short term credit and 5-8 percent for long term credit. A private bank will generally make loans available at interest rates between 12-15 percent. Non-institutional credit is usually available at various interests from a low of 0 percent to above 100 percent.

The average size of a new loan was approximately 6,000 Baht in Nong Sua. Farmers also have an average outstanding loan of about 3,000 Baht. Part-owners who operate the largest units have a particularly high average outstanding loan at over 12,000 Baht. The average repayment rate is 65 percent ranging from a high of 86 percent for part-owners to a low of 37 percent for owners. Table VI-29 summarizes the loan situation of Nong Sua farmers.

The survey does not categorize loans by their due date nor provide information on interest rates. One could speculate that interest rates may be higher in this area because of the heavy reliance on non-institutional sources especially merchants for obtaining credit.

¹Reported in the ALRO socio-economic survey for Ban Na.

TABLE VI-29

AMOUNT OF LOAN IN BAHT FOR PROJECT AREA, NONG SUA

	Loan Outstanding	Amount of New Loan	Repaid on New Loans	Left to Pay on New Loans
Owner	2,808	5,869	2,154 (37%)	3,715
Part-Owner	12,500	9,407	8,121 (86%)	1,286
Tenant	1,757	5,969	3,868 (65%)	2,101
Total	2,789	6,263	4,102 (65%)	2,161

Source: ALRO socio-economic survey.

Farmer Associations and Cooperatives

Neither of the socio-economic surveys contained questions concerning a farmer's membership in farmer associations or cooperatives. In a discussion with the headman of Ban Klong 30 in Ban Na project area, the author found that a number of tenants had formed a farmer association to gain access to credit. From the information in Table VI-27, cooperatives do exist in the area. Whether these cooperatives provide additional services, such as, providing production inputs and marketing outlets, is not known.

Extension

There are two government extension agents for the entire district Ban Na. Because the district is so large, these agents spend little time with project area families. In 1975 extension agents held one group meeting to explain the use of rodenticides. The apparent lack of extension support to farmers in the project area does not stem from a failure of the extension agents to perceive the area's problems. In talking with the head extension agent, it became clear that he simply does not have enough resources to begin a program in the project area.

In talking to farmers in the Nong Sua project area, the author found that the extension agent makes regular visits to talk with area farmers. One farmer said he saw the agent about every two weeks. The agent usually gives him information on seeds, fertilizers, and planting methods. It appears that the extension agent has a healthy relationship with the majority of the farmers in this area.

To aid extension workers and project planners, farmers were asked in the ALRO survey to rank what they thought their most pressing problems were. Table VI-30 ranks the problems from the highest percentage of response to the lowest percent.

TABLE VI-30
FARMER'S ECONOMIC PROBLEMS^a

	Owner	Part-Owner	Tenant	Total	%
Price of Rice	15	18	69	102	17
Not Enough Land	16	20	57	93	15
Poor Soil	18	19	53	95	15
Lack of Capital	12	13	40	65	11
Disease and Insects	7	6	49	62	10
Lack of Rain	4	14	37	55	9
High Interest ^b	1	4	37	42	7
Distance to Market	6	6	14	26	4
No Extension	4	7	11	22	4
Other ^c	10	12	73	95	15

^aNumber of responses for each reason.

^bAll responses in this category from Nong Sua farmers.

^cOther not defined.

Source: ALRO socio-economic survey.

Four major problem areas were identified: price of rice, not enough land, poor soils, and lack of credit. The concern over the price of paddy is understandable. The government has been attempting to change the rice price structure by guaranteeing the price of rice. The program has not worked out as planned so price of paddy has remained low in this area.

Many farmers consider the lack of land a problem, which is interesting considering the large size of farms in Nong Sua. Since most of the respondents were tenants, it could be speculated that they are voicing the desire to own land. It appears that the tenants feel the only way to improve his income is through increasing his farm size or improving the quality of the soil. Oddly enough no one complained about high rents.

With-Without Assessment for Ban Na

Because the proposed development projects for the two study areas are different, the with-without assessments were separated into two sections. This section covers the Ban Na project and the following section examines the Nong Sua project. The procedure which will be followed in the assessment will start by identifying the various sources of family income without the project. Next, the proposed development plan will be presented and its feasibility will be discussed. The important step begins by listing all the assumptions used throughout the test followed by the actual with-without test. The final step examines how sensitive the results are to changes in the assumptions, e.g., the price of rice. Results from these assessments will be used in the cost-recovery analysis in the following chapter.

Farmer's Income

Though the largest portion of the farmer's income is derived from the growing of rice, his total income is composed of returns from marketing upland crops, raising livestock, fishing, and off-farm activities. This section will analyze each component of the farmer's income. In the summary section, each component will be added together to arrive at the total yearly income of a farm family.

Income from rice. In Table VI-18, the net production value of one rai was calculated for each tenure class. Not all the rice is sold in the market. Farmers will have to use some of their rice to pay rent, hire labor, and repay debts. All farm families retain a certain percentage of the rice crop for household consumption. Table VI-31 reflects the distribution of rice output among various uses.

TABLE VI-31

DISTRIBUTION OF RICE OUTPUT IN PERCENT AND
CLASSIFIED BY TENURE PATTERN FOR
PROJECT AREA, BAN NA

	Total Crop kg	Distribution (%)				
		Consumption	Pay Rent	Hired Labor	Pay Debt	Sold in Market
Owner	137,820	27	--	--	--	73
Part-Owner	320,415	24	23	1	1	52
Tenant	204,826	22	22	0*	--	56
Total	663,061	24	18	0*	0*	57

*Less than .5 percent.

Source: ALRO socio-economic survey.

If the amount consumed appears high, it is probably due to the fact that the project area survey added together rice used for consumption purposes and rice held in storage for next year's cropping season. The district survey broke down this category into two parts and found that on the average four percent of the rice crop was retained for the next cropping season. This would reduce consumption for owner, part-owner, and tenant to 23, 20, and 18 percent respectively.

Comparing these last figures with the district survey percentages for consumption, it should be pointed out that the project area owners and tenants consume six percent more rice than their respective groups throughout the district. There is no obvious reason to explain this difference. Possibly more rice is consumed in the project area because of the following: (1) the lack of vegetable crops within the project area (see below); (2) rents could be lower for tenants allowing them to retain more rice (the percentage of rice used by tenants to pay rent throughout the district is 43 percent, considerably higher than the project area); or (3) the poor conditions of the resource base causing farmers in the project area to retain more seed for planting.

In determining the farmer's income, it will be assumed throughout this section that the entire crop is sold in the market. This means that a farm family would be able to purchase rice used for home consumption at the farm gate price. Since rice used to pay debts and other necessities is sold to the merchant at the farm gate price, it is not hard to extend this assumption to the total rice harvest.

Income from upland crops. The growing and marketing of upland crops does not play an important role in the project area. The soil surveys indicate

that upland crops could only be grown on a narrow strip of land along Klong Ban Na. On-site observation confirms this report. No additional income from upland crops will be attributed to project area farmers.

Income from domestic animals and fishing. Livestock and fishing provide small additional incomes to farmers. Fishing usually takes place in the klongs. The raising of pigs, poultry, and water buffalo provide most of the income from livestock. Table VI-32 points out that the overall average additional income attributed to fishing is 250 Baht, and to livestock production 210 Baht.

Income from off-farm activities. Nearly all of the farmers earn income from some sources off the farm. Some of these activities include the making of charcoal, carpentry and other craftsman jobs, civil service, and daily labor. There are no local handicrafts made in the area. In both surveys, the category "other" provided a sizeable percentage of the off-farm income. It is unclear what activities make up this category, though a category for trading and commerce is conspicuously missing from the table.

Another important source of income for farmers especially those with small farms is wages from farm labor. Table VI-32 shows that owners and tenants who tend to have smaller farm plots receive more income from farm wages than part-owners. Plowing services also provides additional income, but only to the very few who have the necessary capital to purchase a tractor. More owners seem to find employment with the civil service than part-owners or tenants.

TABLE VI-32

FARMER'S AVERAGE INCOME FROM NON-RICE ACTIVITIES,
PROJECT AREA BAN NA, IN BAHT PER RAI

	Farm Labor	General labor; Skilled labor	Charcoal	Fishing	Civil Service	Plowing Hire	Income from		Total Non-Rice Income
							Domestic Animals	Other	
Owner	355	280	---	471	2,304	---	180	2,532	6,122
Part-Owner	98	432	---	139	582	893	284	1,621	4,049
Tenants	628	1,416	103	197	655	---	154	546	3,699
Total	229	763	---	247	1,057	---	208	1,455	4,451*

*Includes income from charcoal and plowing.

Source: ALRO socio-economic survey.

Total yearly income. Total income per year has been calculated from data on average farm holdings based on land tenure, Table VI-4; on the average size of net crop budgets, Table VI-18; and average income from off-farm activities, Table VI-32. Total income is reported in Table VI-33.

TABLE VI-33

TOTAL FARM FAMILY INCOME PER YEAR ALL
SOURCES, PROJECT AREA, BAN NA

	Av. Size of farm (rai)	Net Produc- tion Value per rai	Income from Rice ฿	Income from Livestock & Fishing ฿	Off-Farm Activi- ties ฿	Total ฿
Owner	32	443	14,176	651	5,471	20,298
Part-Owner	60	354	21,240	423	3,626	25,289
Tenant	38	315	11,970	351	3,348	15,669
Overall Av.	44	359*	15,796	455	3,996	20,247
Percent			78	4	18	

*From Table VI-16.

Source: Tables VI-4, 17, 18 and 32.

The average annual income appears to be just over 20,000 Baht per family or \$1,000 U.S. This averages to about \$166 U.S. per family member or \$277 U.S. per working member. These figures cannot be directly compared to the total income reported in the district survey because the method used in arriving at district figures was slightly different. In the district survey, the overall average annual income is approximately 19,000 Baht. One noticeable difference between the district survey and

the project area survey is the smaller gap between the total income earned by different land tenure groups in the former survey.

The major component of total income is rice which is 78 percent of the farm family's income. Nearly 20 percent of total income is earned from off-farm activities. Income from livestock and fishing plays a minimal role in total family income. One final adjustment has to be made to annual income. Loans will have to be paid back. If the entire loan (Table VI-28) was liquidated the resulting incomes would be 13,893 Baht, 16,133 Baht, and 10,502 Baht for owner, part-owner, and tenant respectively prior to the initiation of the development project.

Project Feasibility

Resource constraints, especially acidic soils and insufficient and low quality water, have hindered the design of a feasible project for the land reform area. Between January and May, 1976, ALRO officials hoped that a year round irrigation system could be developed. Water flow studies showed that not enough water would be available in the dry season to successfully multiple-crop rice. In May, 1976, a new design was formulated which called for an irrigation system for only the Crown lands and limiting cropping to the wet season. New plans were submitted by the NESDB in November, 1976. These plans called for a smaller but more intensive development project which would be initiated on the Crown lands. The ALRO has accepted the basic concepts of the NESDB plan and will begin the initial phase of the project in February, 1977.

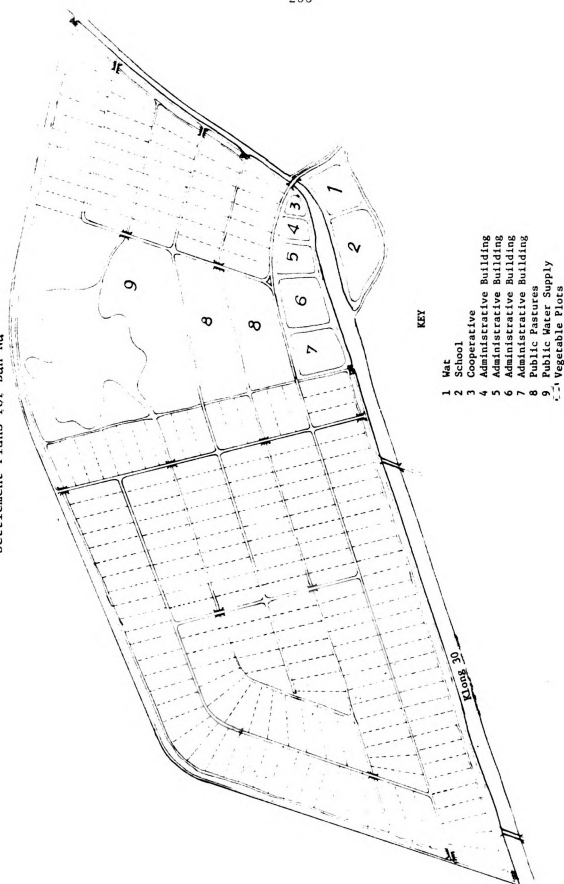
The plan as it is now conceived will allocate 25 rai to each farm family operating on plots within the boundaries of the Crown properties. Twenty-two rai will be allocated to rice production. No water control

system will be provided for these rai, thus, farming methods will follow traditional methods. A land improvement program applying lime over the acidic soils should help improve rice production on these rai. The remaining three rai will be intensively developed for year round vegetable cropping by developing a ditch and irrigation system. A house lot of about one-half rai will also be put on this three rai hence, cultivation will actually take place on 2.5 rai. Plans are to involve 200 families in this project which will develop about 600 rai. Map 7 illustrates the plans as they now exist. Referring back to Map 5 the development site can be located within the land reform area, signified by the large black A. The numbers indicate the following locations: (1) wat; (2) school; (3) cooperative; (4, 5, 6, 7) administrative buildings; (8) public pastures; and (9) public water supply.

To successfully carry out a development scheme such as this, a comprehensive extension program will have to accompany any on-farm development. Farmers will have to be educated in a whole new farming pattern which calls for new crops, new inputs, and new planting methods. Management skills will have to be improved in order to allocate efficiently a large number of production inputs, i.e., hired labor, family labor, fertilizers, insecticides, herbicides, etc. A helpful exercise would be to briefly review the characteristics of vegetable farming in Thailand to see what kind of crops are grown, what inputs are required, what the labor requirements are, and what magnitude of returns can be expected.

Vegetable farming in Thailand. Vegetable farming usually takes place near bigger cities which reduces the cost of transportation, provides grower with access to a market, and offers the buyer a better quality

Map 7
Settlement Plans for Ban Na



KEY

- 1 Wat
- 2 School
- 3 Cooperative
- 4 Administrative Building
- 5 Administrative Building
- 6 Administrative Building
- 7 Administrative Building
- 8 Public Pastures
- 9 Public Water Supply

0-100 Vegetable Plots

product. Though vegetable farming plays a significant economic role for a number of farmers little information exists in the Thai literature. Material for this section has been taken from work done by Dr. Chamnien Boonma at Kesetsart University and the reports of the multiple-cropping project currently being conducted by Chiang Mai University.

Home garden plots are found throughout the country, but their economic importance goes unappreciated by most students of Thai agriculture. Of more importance is the truck farms which supply vegetables to the urban markets. A wide variety of crops are usually available-- asparagus, sweet corn, cabbage, peas, carrots, lettuce, garlic, onion, tomatoes, greenpepper, and cucumber. These are the types of crops the project administrators will have to introduce and find a market for during the initial years of the project.

Farm layout. To farm vegetables, a farmer has to be able to control water. Excess water from heavy rainfall and poor field drainage can cause severe damage to crops while an insufficient water supply in the dry season will deter the growth of the vegetables. Farmers have developed a ditch and dike system which seems to work very well.

Farmers construct their own farm layout by first building up the beds upon which the crops are grown. These beds are about one meter high and vary in width from one to four meters. Next the ditches are constructed. The bed ditches are dug around the beds and are used for watering the vegetables. The farm ditch is the main on-farm ditch which actually regulates the water in the field by pumping in or discharging water when appropriate. This ditch may run through a number of farm plots. The final ditch is the small canal leading from the main water

source which supplies all the fields. Farmers will often build dikes around their field to protect the crops from flooding and act as a wind break. Figures VI-1 and 2 illustrate a typical farm layout and bed and ditch system as found in Changwat Ratchburi by Dr. Chamnien.¹

For the land reform project a large dike will be built around the farm units to prevent flooding. The dike is indicated by the dark blue lines around the outside of the farm units in Map 7. The ALRO will also construct the canals, which will supply water from or drain water to Klong 30 and the canal excavated from Klong Ban Na, and the major ditches. Farmers will be responsible for preparing their own vegetable beds and bed ditches plus maintaining the whole system.

Cropping pattern. Major vegetable farming activities begin in March when the soil is deeply cultivated, organic fertilizer is mixed with the soil, bed ditches are cleaned out and ditches and dikes are repaired. Soil preparation is important because different crops require different soil composition, i.e., root crops like fine, highly pulverized soils while beans grow best in loose soils.²

Dragging and lightly harrowing the field prior to planting reduces weeds. Crops will have to be weeded two to three times during the cropping season. Sowing in most cases is done by directly planting the seeds in the soil.

One unique practice of vegetable farmers is the flooding of their fields for a period of about one month during the rainy season. The purpose for flooding the land is to kill plant pests who are living in the soil.³

¹Chamnien Boonma, et al., Vegetable Production in Amphoe Damnoen Saduak, Changwat Ratchaburi, 1972-1973, Research Report No. 7, Kesetsart University, March 1974, p. 17.

²Ibid., p. 32. ³Ibid., p. 33.

Fig. VI-1--Typical Vegetable Farm Layout

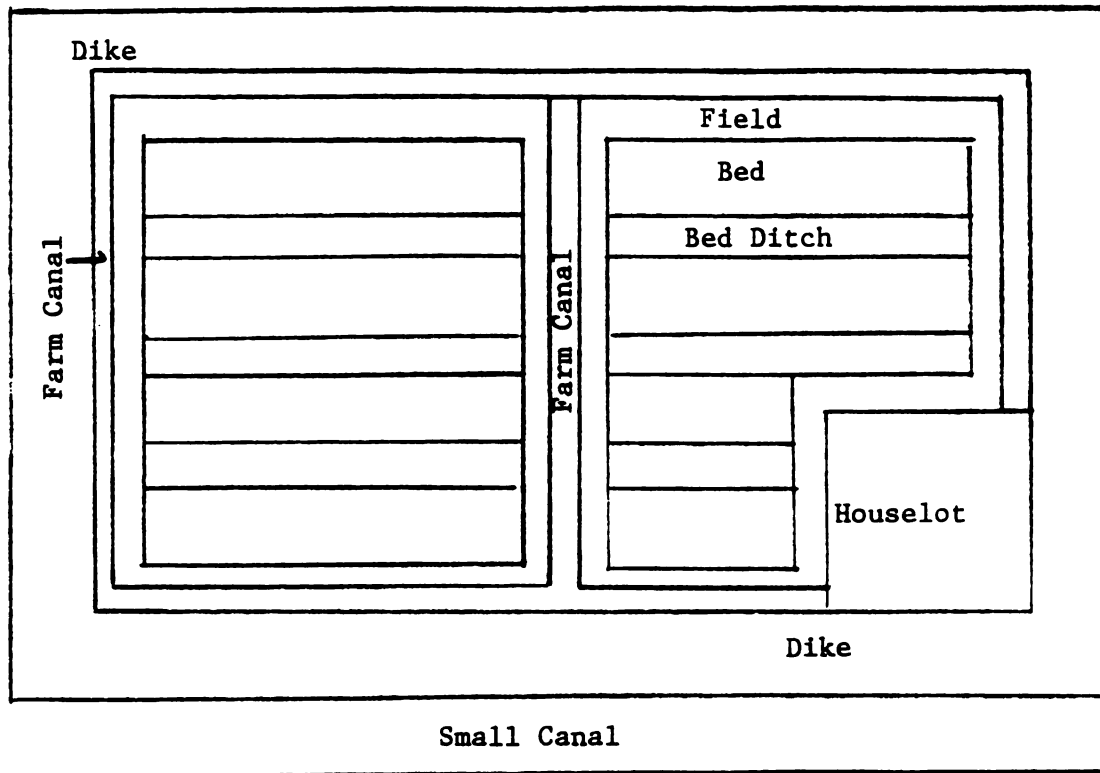
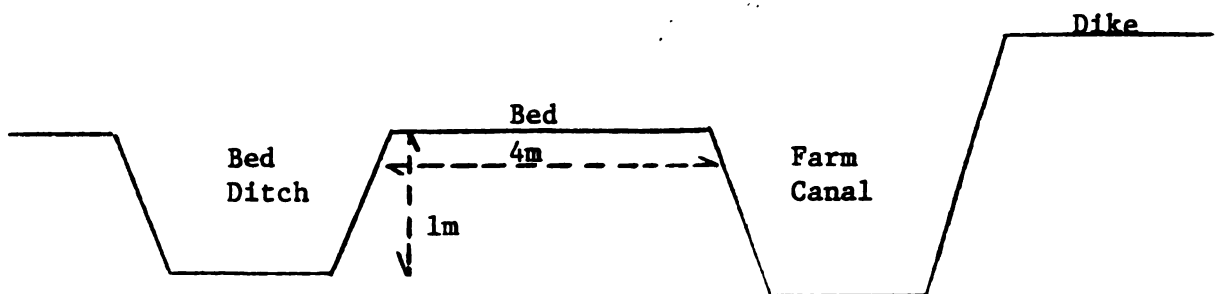


Fig. VI-2--Typical Vegetable Bed, Bed Ditch and Dike System



A variety of crops are grown in a vegetable area. Usually a farmer will grow two or three crops in pure stands or intercrop a fast growing crop with a slow maturing crop, such as, cabbage and sweet corn. On the average, there are two cropping periods though some farmers will crop three or more times a year. It is difficult to determine what type of cropping system will be used because of the number of possible crops available. At the multiple-cropping project at Chiang Mai, researchers suggest that possible winter crops would be potato, wheat, tomato, snapbean, peanut, soy bean and garlic, and that possible summer crops would be sweet corn, cabbage-sweet corn intercropped, mung bean, and sesame. They assume rice to be grown in the wet season.¹ These suggestions may not be adaptable to the project area because of the difference in climatic conditions.

Dr. Chamnien provides a crop calendar in his report which provides a number of cropping system alternatives.² Bananas and other fruit trees can be planted along the dikes while peanuts and taro can be planted along the edges of the bed ditches.

What crops are finally grown in the project area depends upon which crops can tolerate acidic soils. Vegetables grow best in soils with a pH range of six to eight. With liming the acidic conditions of the Ban Na soils will hopefully be reduced to around a level of pH 5. If vegetables do not respond well, an intensive soil rehabilitation program will have to be carried out before vegetables can be grown.

¹Alan R. Thodey, et al., Budget Analysis of Multiple-Cropping Systems Employing Improved Technology and Management, Agricultural Economics Report No. 3 (Chiang Mai: Faculty of Agriculture, Chiang Mai University, 1974), p. 25.

²Chamnien, Vegetable Production, p. 32.

Labor requirements. Labor requirements will change significantly in switching from rice to vegetable farming. Dr. Chamnien's report does not look at labor inputs per activity. In generally explaining vegetable activities, he points out two activities which farmers must perform regularly. First, each farmer performs maintenance of the dike once or twice a year. Sixty percent of the farmers repair their dikes once a year while 30 percent do repair work twice a year. Farmers frequently repair vegetable beds and bed ditches as many as four times a year.¹ Second, a farmer must take daily care of his crops which involves watering, some weeding and possibly fertilizing the vegetable beds.

Alan Thodey provides a more detailed picture of labor input in man hours per rai. Labor inputs vary with type of crops. Sweet corn only requires about 56 man hours per rai of labor while cabbage and garlic require approximately 400 man hours per rai. An average 179 man hours per rai was found for 13 different types of crops. Table VI-34 lists some of the crops that might be adaptable to the Ban Na area and their labor requirement as well as, includes the overall average for the thirteen different crops.²

Compared with labor requirements for rice (Chapter VII), an additional 30 to 100 man hours per rai are needed depending on the rice cultivation practice used in vegetable farming. For most farmers in the project area there will be a significant shift in labor usage when they begin vegetable farming. In some cases, they may have to forego off-farm employment opportunities because of the increased demand for labor.

¹Ibid., p. 25.

²Thodey, Budget Analysis, p. 7.

TABLE VI-34

LABOR INPUTS FOR VARIOUS VEGETABLE CROPS,
MAN HOURS PER RAI

Crop	Nursery	Land Prep- aration	Planting	Care of Crop	Harvesting	Total
Cabbage	160.00	11.34	48.00	41.50	128.40	389.24
Peanut	---	9.84	9.00	21.00	28.83	68.67
Potato	---	18.34	20.00	90.50	80.00	208.84
Snapbean	---	17.34	9.00	27.50	91.50	145.34
Soybean	---	9.34	4.00	40.00	82.00	135.34
Sweet Corn	---	---	9.00	18.50	28.00	55.50
Tomato	28.50	11.34	30.00	83.50	191.50	344.84
Average	14.50	12.11	31.88	40.69	79.58	178.76

Source: Alan Thodey, et al., Budget Analysis of Multiple-Cropping Systems, Table 3, p. 7.

Production costs. Production inputs requirements will change during the shift from rice to vegetables. One important input will be organic matter to build up soil fertility. Without organic matter, vegetables are subject to unfavorable soil conditions which reduces yield or results in crop failure.

Money spent on fertilizer will increase as most vegetables respond to ammosulphate fertilizers. More emphasis will be placed on the use of insecticides and herbicides to control insect pests, fungus, and weeds. Insecticides and herbicides will be most important after the tenth year because pest and diseases tend to become a serious problem in vegetable areas after ten years of cultivation. Expenses for insecticides and herbicides may be more than for fertilizers. In Dr. Chamnien's report, expenses for insecticides runs about five percent higher than fertilizers.¹

¹Chamnien, Vegetable Production, pp. 41-43.

Total production costs in Dr. Chamnien's report ran from a low of 70 Baht per rai for cucumbers to a high of 700 Baht per rai for grapes, with the average being around 240 Baht per rai. The costs included seeds (9 percent of total costs), fertilizers (22 percent), insecticides, including herbicides, (26 percent), family labor (22 percent), hired labor (16 percent), and other expenses, land tax, depreciation of farm equipment and fuel, (5 percent).¹ In Chiang Mai production costs are much higher running from a low of 266 Baht per rai for sweet corn-cabbage to a high of 2,329 Baht for potatoes. Looking at average costs for labor, supplies, and equipment, Thodey shows that 53, 27, and 20 percent respectively of total costs are assigned to these inputs.² Upon comparing the percentage of costs allocated to different activities, one finds a very close comparison on expenditures especially in percent spent on supplies in the two reports. Chamnien does not discuss equipment, but the figures may be hidden in the costs allocated to family and hired labor. Table VI- depicts the allocation of costs between different inputs.

Returns and yields. It is difficult to determine yields since crops are subject to so many variables. Yields are often low and farmers experience negative returns. Information on returns from Chiang Mai will not be useful in this section because the cropping system differs from the one planned for the land reform area. Chamnien presents some return figures for medium size farms, about 15 rai, which he feels adequately reflects the vegetable farming in his study area. His figures show returns for different cropping combinations, but do not specify crops which tend to vary from farm to farm. His results are presented in Table VI-35.

¹Ibid. ²Thodey, Budget Analysis, pp. 5-6.

TABLE VI-35

EXPENSES FOR DIFFERENT INPUTS AS PERCENT OF
TOTAL PRODUCTION COSTS

	Chamnien	Thodey
Supplies	57	53
Labor	38	27
Equipment	--	20
Other	5	--

Source: Generalized from Table 30,
Chamnien, Vegetable Production
and Table 6, Thodey, Budget
Analysis.

TABLE VI-36

NET RETURNS FROM SELECTED CROPPING
COMBINATIONS, BAHT PER RAI

Village	Crops in Combination					Average
	1	2	3	4	5	
Khun Phitak	---	2,156	3,939	4,637	8,140	4,718
Prasatsit	15,581	9,525	18,031	---	---	14,378
Don Kruai	6,802	16,984	15,827	24,817	13,278	14,698
Phaeng Phuai	---	3,630	---	---	---	3,630

Source: Chamnien, Vegetable Production, Table 31.

With-Without Test

Assumptions for with and without projections. Due to the uncertainty which exists concerning what the best development program for Ban Na actually should be, assumptions should be flexible to allow for any further changes in project design. The development program as presently conceived calls for two efforts: land improvement and irrigation development for vegetable cropping.

Rice farming will continue on the land located outside the vegetable plots. Without water control, traditional methods of broadcasting will still be practiced. Liming will be assumed to improve rice yields by 100 kg per rai.¹ One ton of lime will be applied per rai and will cost 70 Baht per ton. It will be assumed that yields will increase one percent a year over the life of the project. The poor quality soil in the area may make this assumption unwarranted unless soil improvement practices are followed when the land is idle, i.e., applications of organic matter to be used as compost.

Other inputs will not change much. Seeds will be supplied from the farmer's own seed stock. If fertilizer, containing 16 percent nitrogen, response is good, applications will increase to 20 kg per rai by the tenth year of the project. Each additional increase of five kg per rai will improve yields by 24 kg per rai (see p. 290). Being introduced to herbicides through vegetable farming, farmers will be encouraged to use herbicides to combat a short stem grass which seriously hinders rice growing in this area. Assuming fertilizer costs of five Baht per kg and

¹Preliminary results from the Land Development Department's liming project indicate that lime applications of one ton per rai improves rice yields by 100 kg per rai. This information was given to me by Prayong Saiprasert, project leader.

total expenditures for insecticides and herbicides of 20 Baht per rai, total costs will increase slightly over the life of the project.

Soil will be plowed once by tractor at a cost of 50 Baht per rai. Any additional plowing and puddling activities will be done with the family water buffalo. Labor for planting and weeding will be supplied by the family. Hired labor will be used for harvesting at a cost of 50 Baht per rai.

The maximum farm gate price for paddy rice will be assumed at 2.2 Baht per kg. Price levels have been much lower recently in this area and it may be realistic to expect rice prices to remain at approximately 1.8 Baht per kg. (For the reasoning behind the assumed rice price refer to p. 288.)

For vegetable farming, it will be assumed that a two crop combination planted twice a year will be introduced. In the eighth year, a third crop will be added. Cropping intensity for some farmers may well increase to three plantings a year. This factor will not be introduced in this report. It can be incorporated later if it is found that farmers are responding enthusiastically to vegetable farming.

Yearly net income is expected to average 2,000 Baht per rai in years one to three of the project. During the initial phases of the project, production may be erratic and net income could possibly vary widely. Losses on a number of plots should be expected. From years four to seven, net income should increase to 4,000 Baht per rai. A third crop, introduced in year eight, will increase net income to 6,000 Baht per rai for the period of years 8-14. From years 15 to 20, net income will average 8,000 Baht per rai. These figures should serve as guidelines only. It must be pointed out that crop failures can and will occur. Adjustments will have to be made in the income projection every few years.

Costs will be figured at 240 Baht per rai per planting. Costs per rai will be allocated between seeds (22 Baht), fertilizer (53 Baht), insecticides and herbicides (62 Baht), hired labor (38 Baht), land tax, if applicable, and depreciation expenses (12 Baht), and equipment for soil preparation and maintenance material (53 Baht). Applications of fertilizer, insecticides, and herbicides will vary depending on the crops selected for planting and pest and disease problems. After year ten, pests and disease could be a serious problem. Prices for inputs are bound to increase over time and inflation may well be expected to increase prices another 25 percent. Costs will be assumed to remain relatively constant over the life of the project except for increases in fertilizer, insecticide and herbicide usage. Yet, it should be known that cost estimates will probably be under actual market prices.

The farmers will receive all needed inputs through a cooperative set up by the government. It will be assumed that the government will provide all the inputs to the cooperative in time to meet the farmers' demand and cropping schedule.

Farmers will need organic fertilizer for their vegetable beds. There are no duck, chicken, or other livestock raising ventures in the area. Where organic fertilizer will come from and how much it will cost is not known at this time. A complementary project for this area would be a livestock program which will not only improve incomes, but provide a necessary input to the vegetable program.

Loans will be provided by the cooperative. Farmers will receive 300 Baht per rai per planting at 12 percent interest, for production purposes. This amount should be enough to meet the expenses farmers will incur especially during the early stages of the project.

It will be assumed that without the project the agricultural situation will remain the same. Few farmers will assume the risk involved in vegetable farming especially considering the poor resources of the area. Fertilizer applications will not increase unless more herbicides are used to control the grass. The fairest assumption to make is that area farmers will continue to operate as they have been and the soils will continue to slowly deteriorate.

Farmer's income with and without cases. Many questions arise concerning the validity of the income projections as summarized in Tables VI-37 and VI-38 (figures for all years can be found in Appendix C). The most serious uncertainty is the soil potential. Even with liming and increased fertilizer applications, yield response may be no more than 300-350 kg per rai. Poor soils can seriously hinder the introduction of vegetable farming. No pilot projects have been carried out to see if the area is conducive to vegetable farming. Hence, income projections for vegetable farming may be inconsistent with what will actually occur. Also, no crop failures have been introduced into the projections, but this factor cannot be easily dismissed. Only through a properly administered soil management program and an aggressive extension program will projected incomes actually become reality.

Table VI-39 reviews the total yearly net income a 25 rai farming unit can expect to generate with the project. The third column has been computed by multiplying the yearly rice income per rai by 22 rai and the yearly income per rai from vegetable farming by 2.5 rai and adding the results. These figures have not been discounted to reflect present value of future income streams.

TABLE VI-37

WITH AND WITHOUT PROJECT PROJECTIONS FOR
LAND IMPROVEMENT IN BAN NA

Item	Units	Without Case	With Land Improvement Project				
		Broadcast	Broadcast, Baht/rai				
Year:		0	1	5	10	15	20
<u>Capital</u>							
Yield	kg	209	309	345	386	406	426
Price of Paddy	฿	2.2	2.2	2.2	2.2	2.2	2.2
Gross Value	฿	460	680	759	849	894	939
Loan Funds	฿	150	300	300	300	300	300
Total Capital	฿	610	980	1059	1149	1194	1239
<u>Expenses</u>							
Soil Prep.	฿	21	50	50	50	50	50
Planting	฿	10	---	---	---	---	---
Harvesting	฿	26	50	50	50	50	50
Fertilizer	฿	33	50	75	100	100	100
Insecticide & Herbicide	฿	---	20*	20	30	40	50
Lime	฿	---	70	---	---	---	---
<u>Loans</u>							
Interest	฿	18	36	36	36	36	36
Repayment	฿	150	300	300	300	300	300
Total Expenses	฿	258	526	531	566	576	586
<u>Net Income</u>	฿	352	454	528	583	618	653

*With project expenses for insecticides and herbicides have been combined.

Source: Computations based on listed assumptions.

TABLE VI-38

WITH PROJECT PROJECTIONS FOR VEGETABLE
FARMING IN BAN NA

Item	With Case: Vegetable Farming						
	Baht/rai						
Year:	1*	3	5	8**	10	15	20
<u>Capital</u>							
Gross Estimated							
Production Value	2842	2842	4942	6942	7052	9052	9052
Loans	300	300	300	300	300	300	300
Total Capital	3142	3142	5242	7242	7352	9352	9352
<u>Expenses</u>							
Seeds	22	22	22	22	22	22	22
Fertilizer	53	53	75	75	100	100	100
Insecticides &							
Herbicides	62	62	90	90	120	120	120
Depreciation & Other	12	12	12	12	12	12	12
Soil Preparation &							
Maintenance	53	53	53	53	53	53	53
Sub Total: one planting	240	240	290	290	345	345	345
Sub Total: two plantings	480	480	580	580	690	690	690
Lime	70	---	---	---	---	---	---
Loans							
Interest	62	62	62	62	62	62	62
Payment	600	600	600	600	600	600	600
Total Expenses	1212	1142	1242	1242	1352	1352	1352
<u>Gross Estimated Net Income</u>	1930	2000	4000	6000	6000	8000	8000

*Two crop combination.

**Three crop combination.

Source: Computations based on listed assumptions.

TABLE VI-39
 YEARLY NET INCOME EXPECTED WITH
 THE PROJECT, IN BAHT

Year	Rice Income/rai	Vegetable Income/rai	Yearly Net Income
1	454	1,930	14,813
2	530	2,000	16,660
3	537	2,000	16,814
4	544	4,000	21,968
5	528	4,000	21,616
6	455	3,930	19,835
7	532	4,000	21,704
8	539	6,000	26,858
9	546	6,000	27,012
10	583	6,000	27,826
11	512	5,930	26,089
12	591	6,000	28,002
13	600	6,000	28,200
14	609	6,000	28,398
15	618	8,000	33,596
16	547	7,930	31,859
17	626	8,000	33,772
19	644	8,000	33,968
20	653	8,000	34,366

Source: Computations based on listed assumptions.

It appears that it will take about three to five years for a farmer's income to reach the level of yearly income from rice without the project. This is mainly due to the reduction in farm size which will accompany the land reform program. Actual returns per rai will increase after the project begins. On an average 25 rai farm, without the project yearly income is approximately 9,000 Baht. With the project, participants will double their income by year five of the project and by year twenty incomes can be expected to be almost four times higher.

Participants will probably be farming continuously throughout the year, if conditions permit. Some farmers may have to give up income from off-farm activities. On the average a farmer earns about 4,000 Baht from off-farm activities for a combined yearly income of 13,000 rai. Farmers will still be better off with the project even at the expense of losing off-farm income. Income from fishing and livestock will still be earned by the farmers. Even for owners and part-owners, participation in the project may accrue more benefits to the individual. Tenants will definitely improve their living conditions through the benefits of the project.

No sensitivity tests will be conducted for this section because of the rather arbitrary assumptions which have been made especially for vegetable farming. The most sensitive assumption for the rice projections concerns the rice price. Rice prices are currently around 1.8 Baht per kg in this area. Improvement in the rice price may not occur, so farmers may only receive 1.8 Baht per kg. If a lower rice price is received, total income should be adjusted downward, e.g., at 1.8 Baht per rai, incomes would be 18 percent lower.

The most sensitive issue with vegetable farming is the overall uncertainty of the area to support vegetable farming. Even though rather promising incomes have been forecast, it is uncertain if these levels can be attained. Again crop failure and sudden reductions in market price continually effect farm incomes. Neither of these factors has been considered into the projections.

In the cost-recovery analysis in Chapter VII, only the income from vegetable farming will be used since this is the only part of the project which involves irrigation development. Any improvement in rice production will come as a result of the efforts of the individual farmer.

With-Without Assessment for Nong Sua

This assessment will follow the same format as in the Ban Na section. Since there is a greater degree of certainty about the environment of rice production, than vegetable farming, it has been easier to carry out sensitivity tests to measure any changes in prices, interest rates, or other basic assumptions.

Farmer's Income

Farmer's income is mainly derived from growing rice. A farmer may supplement his income by performing off-farm tasks, raising livestock, fishing, and working for the civil service. Thus a farmer's total income may be composed of several different components, which will be reviewed in this section.

Income from rice. In Table VI-25, the net production value of one rai was calculated for each land tenure class. Farmers use rice to pay debts and rent, for family consumption, and to use as stock seeds. The distribution of rice output is shown in Table VI-40.

TABLE VI-40

DISTRIBUTION OF RICE OUTPUT, IN PERCENT, AND
CLASSIFIED BY TENURE CLASS, NONG SUA

		Use				
	Total Crop kg	% Consumption	% Debt & Rent	% Seed Stock	% Storage	% Market
Owner	451,080	7	4	5	2	81
Part-Owner	656,160	11	14	7	1	66
Tenant	1,965,600	18	24	7	2	49
Total	3,072,840	15	19	7	2	57

Source: ALRO socio-economic survey.

Rice consumption appears to be less in this area than in Ban Na, especially for owners. Owners sell 82 percent of their rice crop in the market. Tenants must retain portions of the crop to meet rental payments leaving them about 50 percent of their crop to sell in the market. Actually, the rice used to pay debts and rents will eventually be marketed. The total amount of rice which reaches the market is over 75 percent of rice harvested. In determining the farmer's income, it will be assumed that the entire crop is sold in the market. This means that a farm family would be able to purchase rice for consumption at the farm gate price.

Income from upland crops. The socio-economic survey provides no information on upland crops except that a small percentage of the land area is used for this purpose. This might indicate that upland crops exist mainly as garden crops. Garden crops may be very important to the family's diet. This is an important economic role, but one which is difficult to put a value on. For the purpose of this report, no income will be generated from upland crops.

Income from domestic animals and fishing. Livestock and fishing serve as a good source of additional income especially the raising of pigs and ducks. The canals provide opportunities for fishing, and a water supply for fish ponds.¹ Table VI-41 shows overall average additional income derived from livestock and fishing. Owners receive the most from fishing activities, about 270 Baht, while part-owners receive about 2,350 Baht from livestock.

TABLE VI-41

FARMER'S AVERAGE INCOME FROM NON-RICE
ACTIVITIES, IN BAHT, NONG SUA

	Ag. Labor	General & Skilled Labor	Fish- ing	Civil Service	Domestic Animals	Com- merce	Other	Total Add. Income
Owner	500	220	272	2,847	833	3,482	2,383	10,537
Part-Owner	500	126	158	1,316	2,350	79	---	4,529
Tenant	316	232	63	108	925	407	191	2,042
Total	358	220	93	498	902	672	384	3,122

Source: ALRO socio-economic survey.

Income from off-farm activities. Nearly all farmers earn some additional income off their farm. Activities included farm labor, off-farm labor, civil service, and commercial activities. The most important sources of income for the owners are civil service jobs, commercial enterprises, and an ambiguous 'other.' Civil service also provides most of the income for part-owners. Tenants take on a variety of activities which contribute in small amounts to total income.

¹On visiting the area, the author saw two good size fish farms.

Total yearly income. Total income per year has been calculated from data on the average size of farm, Table VI-4; crop budgets, Tables VI-24 and 25; and the income from off-farm activities, Table VI-41. Total income is reported in Table VI-42.

In determining total income from rice, it was assumed that a farmer would plant the entire area he operated during the wet season; but during the dry season, he would plant only 16 percent of his arable land. For example, an owner plants 84 rai in the wet season which returns 326 Baht per rai or 27,384 Baht total. In the dry season, he plants 13 rai ($.16 \times 84$) which returns 608 Baht per rai or 7,904 Baht total. In two cropping seasons, he would earn 35,288 Baht.

The average annual income is above 26,500 Baht per family or \$1,330 U.S. This comes out to approximately \$190 U.S. per family member or \$330 U.S. per working member. Unlike Ban Na where there was little disparity between tenure groups, Nong Sua has a large income gap between owners and part-owners, and tenants. Those who own all or part of their land earn twice the amount of full tenants. Farm sizes are so large in this area that they can easily distort how rice income is distributed. Since rice is the most important income source (88 percent), this data suggests that a program which would redistribute land in the favor of the tenants is warranted.

If adjustments were made to include repayment of new loans net income would be 42,110 Baht, 46,161 Baht, and 19,866 Baht for owner, part-owner, and tenant respectively prior to the project. If the loan outstanding was to be paid back out of 1975 income, part-owner incomes would have to be substantially adjusted downward.

TABLE VI-42
TOTAL FARM FAMILY INCOME PER YEAR, ALL SOURCES,
IN BAHT, NONG SUA

	Average Size of Farm (rai)	Net Production Value		Income from Rice	Livestock & Fishing	Off-Farm Activities	Total Income
		Season 1 (100%)	Season 2 (16%)				
Owner	84	326	608	(27,384 + 7,904) = 35,288	1,105	9,432	45,825
Part-Owner	111	326	374	(36,186 + 6,732) = 42,918	2,508	2,021	47,447
Tenant	56	293	391	(16,408 + 3,519) = 19,927	788	1,254	21,969
Overall Average	64	305	411	(19,520 + 4,110) = 23,630	955	2,127	26,752
Percent:				88	4	8	

Source: Tables VI-4, 24, 25 and 41.

Project Feasibility

The land reform area in Nong Sua has the potential for a successful irrigation development project. Water is plentiful and major canals already exist. The pH of the soils is not too serious and is correctable. A variety of crops are already grown in the area which will make diversification easier. Extension activities and information are already available to area farmers.

A design has not yet been developed for the land reform area, but the Dutch government is providing assistance on this activity. The project will begin in 1977 and will center around tracts of Crown land because private lands have not been purchased. With the slope less than one percent, irrigation construction will not be difficult and less costly. It will be assumed that the project design will be the most feasible for the area.

In addition to putting in an on-farm irrigation system, a concurrent land improvement program, using lime will be undertaken. This will reduce the acid content of the soil making it more responsive to fertilizers for both rice and upland crops.

Extension activities will have to be expanded as farmers begin double cropping and diversification activities. Improved seed variety will have to be made available as well as information on new planting techniques. Better education programs for farmers will also be needed to train farmers to drive tractors, raise livestock, and repair farm machinery.

With-Without Test

Assumptions for with and without projections. In double cropping, cropping intensities play a very important role. During the wet season,

farmers will plant rice on 100 percent of their tillable land. Cropping intensity in the dry season will start at 30 percent for the first four years. This will allow the farmer time to adjust to new methods and different cropping schedules. In years five to nine, intensity will increase to 50 percent; during years 10-15 intensity will be 75 percent; and, after year 15, intensity will level off at 85 percent. ILACO has found that cropping intensities seldom go higher than 85 percent during the dry season and usually fluctuate between 65-75 percent.¹

Currently, the highest cropping intensities in Thailand are found in the Chiang Mai area. Since cropping indices have not been calculated for other areas of Thailand, there is no reference point to gage how intensive agriculture activities may become. Central Plains' farmers, in general, have fallen short of expected production. ALRO officials feel confident that cropping intensities can be increased to 185 percent within the project area. For this reason, the initial assumption has been made that dry season cropping intensity will reach 85 percent. Later, consideration should be given to the possibility that cropping intensity will level off after year ten at about 50 percent.

The price of rice has been set at a maximum of 2.2 Baht per kg. This seems to be the maximum price for rice in the area. The government has talked about making 2.2 Baht the minimum acceptable farm gate price, but no official action has taken place. Another factor which suggests that 2.2 Baht per kg is a maximum price is the decline in prices in the world grain market since 1976. Good harvests for corn and wheat crops, especially in the U.S. and Russia, are expected and could depress the price of all grains. Consideration should be given to the possible decline in

¹Chao Phya (sic) Development Project, p. 266.

the rice price to around 1.8 Baht per kg due to fluctuations in the world market. Initial figures will be calculated using 2.2 Baht per kg.

Yields will be affected by a number of factors: liming, fertilizers, water control and planting techniques. Soil improvement by the addition of lime is expected to increase yields by 100 kg per rai. The farmer will have to pay 70 Baht per ton, enough for one rai, which will cover the cost of transportation. Lime will have to be applied every fifth year. Through better water control and planting techniques, yields will be assumed to increase at two percent for years one to ten in the wet season and years one to five in the dry season at 1.5 percent for years 11 to 15 in the wet season and years six to ten in the dry season and at one percent for years 16 to end of project in the wet season and years 11 to end of project in the dry season.¹ (Since yields are already higher in the dry season they will not expand as rapidly as wet season yields.)

Fertilizers are already widely used throughout the area. Applications will be increased in stages over the 20 years of the project. Initial application during the wet season will be 20 kg per rai, up from approximately 11 kilograms in the without case. In year six, application will be increased to 25 kg per rai; in year 11 to 30 kg per rai; and in year 16 to 35 kg per rai, the maximum application in the wet season. Dry season fertilizer usage is already high: 30 kg per rai will be applied in years one through five, 35 kg per rai in year six through ten, and 40 kg per rai in years 11 and over. The maximum application of fertilizer in the dry season will be 40 kg per rai.

¹These figures have been derived from a number of project reports and discussions with researchers. Most helpful were the ILACO reports and talks with researchers at the Rice Division, Ministry of Agriculture, Kesetsart University.

The additional use of one kilogram of nitrogen, 2.5 kilograms of a fertilizer containing 16 percent nitrogen, will be assumed to increase yields by about 12 kilograms per rai. This is a rather rigid assumption since the relationship is not linear but depends on the amount of fertilizer applied. Nitrogen fertilizers come in the form of ammophosphates with concentrations of 16, 18 and 20 percent nitrogen. Urea is also available with a nitrogen content of 45 percent. Fertilizer with 16 percent nitrogen will be applied throughout the life of the project with optimum applications ranging from 30 to 40 kilograms of fertilizer per rai. The average cost for one kilogram will be five Baht per kg.¹

Farmers will use 10 kilograms of improved seed varieties per transplanted rai. Seed costs approximately 22 Baht per 10 kg.

Insecticides and herbicides are already widely used throughout the area. A combined outlay of 25 Baht per rai for insecticides and herbicides will be assumed for the first four years of the project. This amount will gradually increase over the life of the project.

Size of loans have been based on the local amount a cooperative or farmers' association can lend a member for short term production purposes-- 7,000 Baht, approximately 300 Baht per rai for a 25 rai farm. Interest rates will be assumed to be 12 percent. Some general and rather shakey assumptions have been made concerning the ability of farmers to save. Double cropping will hopefully double farm income within a few years. If encouraged to save, farmers will rely less on loans and more on accumulated capital after the initial years of the project. For this reason,

¹Similar calculations can be found in ILACO, Chao Phya (sic) Project, p. 250 and 315.

loans have been slowly phased out over the life of the project.² An important reminder on the word 'encourage': there must be some force behind committing farmers to save, if not the 7,000 Baht received through cooperatives will not be enough leaving the farmer no choice but to return to merchants, moneylenders, and other sources for capital.

Labor costs sometimes fluctuate between areas, but on the whole the following assumed costs are standard for the Central Plains region. Though the land used for a nursery is small, non-cash labor requirements for nurturing the shoots until transplanting time are high. Farmers pay about 20 Baht per 100 bundles (enough for one rai) in preparing the plants for transplanting. This will be the assumed cost for this activity.

Generally, the soil is plowed twice, to insure good aeration and weed control and puddled with water buffalo prior to planting. Tractor charges are around 50 Baht per rai per plowing. For each cropping season, the charge for soil preparation would be 100 Baht per rai, assuming farmers use their own buffalos for puddling. Another alternative is the use of individually owned small tractors or rototillers which are already quite common in this area. A cooperative could rent small tractors to its members for a small rental fee. Since this latter alternative is not planned for the early stages of the project, an assumed cost of 100 Baht per rai for soil preparation will be made.

Standard labor rates of 30 Baht per rai for planting and 50 Baht per rai for harvesting will be assumed. A smaller charge of 10 Baht

¹From field observations in the Chainat irrigation area, it appears successful farmers have been able to phase out their need for yearly production credit and rely on personal savings to meet expenses.

per rai will be made for weeding, but most of the labor for this activity will be contributed by family members.

Labor availability may be a critical factor. No data are available on projected labor inputs. If labor inputs fall short of demands, farmers will probably not be able to crop as intensively as planned and will have to pay higher wages. No adjustments in the calculations will be made for a shortage in the labor supply even though the possibility exists. The possibility that the project could not have as promising results as expected should be kept in mind by the decision-makers.

No information is available on soil potential. Whether crops will respond as significantly as expected to fertilizer and liming applications is not known for sure. Satisfactory yields being presently obtained in the dry season by some farmers tend to indicate good soil potential. For the purposes of this section, yield projections have been kept low until more results are obtained on the actual soil potential.

A last necessary assumption deals with the agricultural situation without the project. It will be assumed that the current agricultural situation will not change significantly in the future. This is a rigid assumption since a number of new crops, e.g., oranges, watermelons, and flowers, have already been introduced in the area. Changes will still take place, but slowly only affecting a few farmers. An initial assumption concerning the with project case is that the cropping pattern will be two crops of rice a year for the duration of the project. Diversification should be actively considered by project administrators.

Farmer's income with and without cases. Table VI-43 projects farmer income out over the duration of the project using the assumptions listed above (figures for all years can be found in Appendix D). Table VI-44 summarizes the incomes earned throughout the life of the project. The column for the dry season has been calculated by multiplying the net income for each year by the corresponding cropping intensity. The without case has been added for comparison. These numbers have not been discounted to reflect present value of future income streams.

Throughout the project farmer incomes steadily improve. In year five, total income is 2.5 times higher, 3.5 times in year ten, 4.5 times in year 15, and six times in year 20 than the without case. In the twentieth year, a 25 rai farm where rice is grown on 23 rai will have an annual net income of 50,000 Baht (\$2,500 U.S.). The benefits to tenant farmers especially is significant. If incomes of this magnitude can be obtained, there will be a noticeable change in land use since one-fourth to one-half the land will be generating the same income as all the land without the case.

Sensitivity tests. If a drop in the rice price should occur or farmers are unable to maintain cropping intensities of 185 percent, drops in income will occur. The results depend also on input prices since yields are affected by the amount of inputs applied. The following discussion will look at the impact of a price reduction in rice to 1.8 Baht per kg and the leveling off of cropping intensity in the dry season at 50 percent. No changes will be assumed to take place in the price of or application of fertilizer.

TABLE VI-43

WITH AND WITHOUT PROJECT PROJECTIONS OF FARMER INCOME, NONG SUA

Year	Units	Without Case				With Case											
		Broadcast		Transplant		Transplant Both Seasons											
		A ^a	B ^b	1A	1B	3A	3B	5A	5B	8A	8B	10A	10B	15A	15B	20A	20B
Capital																	
Gropping																	
Intensity	%	100	16	100	30	100	30	100	50	100	50	100	75	100	75	100	85
Yield	kg	215	362	400	520	416	540	432	560	520	644	541	660	644	750	745	800
Price of Paddy	₱	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Gross Value	₱	473	796	880	1144	915	1188	950	1232	1144	1417	1190	1452	1417	1650	1639	1760
Loan Funds	₱	100	100	300	300	300	300	200	200	200	200	150	100	150	100	100	---
Total Capital	₱	573	896	1180	1444	1215	1488	1150	1432	1344	1617	1340	1552	1567	1750	1739	1760
Expenses																	
Nursery	₱	---	---	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Soil Prep.	₱	20	39	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Planting	₱	20	58	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Weeding	₱	---	---	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Harvesting	₱	40	73	55	55	55	55	55	55	55	55	55	55	55	55	55	55
Seeds	₱	6	6	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Fertilizer	₱	55	143	100	150	100	150	100	150	125	175	125	175	150	200	175	200
Insecticide & Herbicides	₱	---	9	25 ^c	25	25	25	35	35	35	35	45	45	55	55	55	55
Lime	₱	---	---	70	---	---	---	---	---	---	---	---	---	---	---	---	---
Loans																	
Interest	₱	12	12	36	36	36	36	24	24	24	24	18	12	18	12	12	---
Repayment	₱	100	100	300	300	300	300	200	200	200	200	150	100	150	100	100	---
Total Expenses	₱	253	445	776	756	706	756	604	654	629	697	583	587	628	622	597	510
Net Income	₱	320	451	404	688	509	732	546	778	715	938	757	965	939	1128	1142	1250

^aA = Wet Season ^bB = Dry Season^cWith project expenses for insecticides and herbicides have been combined.

Source: From computations based on listed assumptions.

TABLE VI-44

NET INCOME WITH THE PROJECT FOR BOTH GROWING SEASONS,
 ACCORDING TO CROPPING INTENSITIES,
 PER RAI, IN BAHT

Year	Wet Season	Dry Season	Total
1	404	206	610
2	492	213	705
3	509	220	729
4	527	226	753
5	546	389	935
6	601	451	1,052
7	698	460	1,153
8	715	469	1,184
9	737	478	1,215
10	757	724	1,481
11	800	814	1,614
12	889	824	1,713
13	909	834	1,743
14	929	843	1,772
15	939	846	1,785
16	999	982	1,981
17	1,085	997	2,082
18	1,100	1,010	2,110
19	1,120	1,025	2,145
20	1,142	1,063	2,205
Without Case:	320	72	392

Source: Table VI-43.

A reduction in the price of rice to 1.8 Baht per kg will reduce income by approximately 18 percent. Column 1 of Table VI-44 shows the total income after the price reduction occurs. In year twenty, the farmers would be receiving a total income that is five times higher than the without case. He would have a yearly net income of slightly over 41,000 Baht in year twenty.

TABLE VI-45

SENSITIVITY OF INCOME TO CHANGES IN
RICE PRICE AND CROPPING INTENSITY

Year	Total Income if the Price Dropped to 1.8 Baht/kg	Total Income if Dry Season Cropping Intensity Leveled off at 50%	Total Income if Dry Season Cropping Intensity is 50% and Price Dropped to 1.8 Baht/kg
1	500	610	500
2	578	705	578
3	598	729	598
4	617	753	617
5	767	935	767
6	863	1,052	863
7	945	1,153	945
8	971	1,184	971
9	996	1,215	996
10	1,214	1,242	1,018
11	1,323	1,280	1,050
12	1,405	1,375	1,128
13	1,429	1,405	1,152
14	1,453	1,432	1,174
15	1,464	1,445	1,185
16	1,624	1,519	1,246
17	1,707	1,612	1,322
18	1,730	1,635	1,340
19	1,759	1,663	1,364
20	1,808	1,692	1,387

Source: Computational adjustments of Table VI-44.

Leveling off the dry season cropping intensity at 50 percent after year ten would reduce incomes between years 10 and 20 by about 20 percent a year. Adjusted incomes are shown in Column 2. In year twenty, a farmer would have a net income of approximately 39,000 Baht. If both a price reduction and a leveling off in intensities occurred total incomes would be reduced by around 35 percent. Net income for 23 rai of paddy would come to about 32,000 Baht in year twenty.

Summary

This chapter deals with measuring the impacts of proposed agricultural development on project beneficiaries by examining incomes with and without the project. From information on the general setting of the selected land reform project areas, severe resource constraints exist. The deteriorated condition of the soil which is highly acidic in the Ban Na area and the uncertainty of a reliable water source contribute to the poor performance of the agricultural sector in these areas. Improvement of land and water resources should be the central focus in the design of an appropriate agricultural development project.

Population statistics suggest that the population has nearly stabilized, with out-migration balancing natural population growth. This suggests that the resources in this region do not have the capacity to support additional people under present conditions. Incomes for families in these areas are below income levels in the more fertile areas of the Central Plains and unskilled urban workers. Farmers produce enough rice and other agricultural products to maintain their existence above the subsistence level. The high rate of tenancy especially in Nong Sua, high rental rates especially in Ban Na, the low farm gate price of rice,

and weak agricultural institutions, perpetuate a situation which does not leave many opportunities for farmers to improve themselves.

In determining the various costs of rice production, labor costs are difficult to formalize. In this chapter and the following one, labor has been valued at the current wage rate for hired labor. This value may not correspond to the value family members place on their own labor inputs. In some cases, the values reflected in this report undervalue the cost and returns to family labor and, at other times, subsidizes these costs and returns. Handling labor in this manner may not be the most appropriate but, considering the available data, it is the easiest for this particular analysis.

With the land reform projects, farmers in the designated areas should see an improvement. The results predicted in this chapter are very optimistic about what can happen. The high income projections should be tempered because of the uncertainty surrounding vegetable farming in Ban Na, soil response to lime applications, and the ability of farmers to adjust to new methods and the ALRO to provide needed inputs. Irrigation development in Nong Sua has all the necessary ingredients to be successful and meet these income projections. Continued frustration over finding an acceptable solution to the problems in Ban Na certainly does not convey a feeling that projected incomes will be met. If the primary goal of the ALRO is to improve the welfare of these people, the projects described in this section should help to some degree in bettering the quality of life for project beneficiaries.

CHAPTER VII

COST-RECOVERY ANALYSIS

This chapter centers on the determination of the payments farmers should make for the on-farm development investments described in the previous chapters. The initial step is to estimate the returns to the different inputs in the production process: capital, labor, management, and land which includes the returns to water. These returns can be found by allocating the net income per rai according to a pre-determined allocation system between the different factors. Next, the chargeable amount, the return to water, is discounted. Discounting will give the net present worth of the chargeable amounts. As a final step, the cost stream for investment is compared with the expected benefits. This comparison permits calculation of the time period for recoupment of investments.

In assessing the farmer's capability for repaying development costs, it must be kept in mind that in implemented areas new agricultural techniques will be introduced. Higher production can only be realized if farmers are prepared to accept and apply modern agricultural methods. Labor requirements will be higher and better management skills will be needed. To assure willing participation by farmers, incentives must be high enough to induce farmer responses.

Since charges have not been previously assessed for irrigation developments, the only reasonable means for recouping project costs is to

charge farmers for the use of irrigation water as these charges can be based on the economic returns associated with the use of water and will leave farmers with fair returns for their other resource inputs of capital, management, and labor.

Returns to Inputs

In Table VII-1 and VII-2, the net income per rai has been listed in the second column. The year '0' is the without project case, and year '1' begins cultivation with the project (Appendix E presents calculations for all years). The net income represents the gross income less production costs, as computed in Chapter VI.¹ For the Nong Sua area, the net income has been adjusted for the appropriate cropping intensity. Project life will be extended to twenty-five years with net returns generated in year 20 being applicable to years 21 to 25.

An allocation of the net income has been made between the different factors. After making allocations to capital, labor, management, and land, the remainder of the net income is assigned to water. In Ban Na, the water component is based on vegetable farming while in Nong Sua the two seasons have been added together, Table VII-2C. Prior to on-farm development, some farmers in Nong Sua area were able to irrigate from the main canal system. In the '0' year of the dry season, a certain portion of the net income went to the water component. After on-farm implementation, the water component increased. In deriving the chargeable amount, the '0' portion was subtracted out of the water component for the years with the project. More details on how each factor's return was determined is given below.

¹The net income has not been adjusted for two factors: (1) a risk allowance or (2) land tax. For private owners within a project area, the land tax would have to be included in the operating costs usually five Baht per rai. Those renting from the ALRO will not have to pay a land tax.

TABLE VII-1

INCOME ALLOCATION TO PRODUCTION FACTORS FOR VEGETABLE
FARMING IN BAN NA LAND REFORM AREA

Years	Gross Income	Net Income Per Rai	Factor Allocation per rai				
			Capital	Labor	Management	Land	Water
0	460	352	10	132	46	164	0
1*	2842	1930	34	896	284	358	358
5	4942	4000	34	896	494	1288	1288
8	6942	6000	34	896	694	2188	2188
10	7052	6000	34	896	705	2181	2181
15	9052	8000	34	896	905	3082	3082
20	9052	8000	34	896	905	3081	3081
25	9052	8000	34	896	905	3081	3081

Year '0' Broadcast Rice
Year '1' Vegetable Farming

*Year for lime application.

Source: From computations based on listed assumptions and Table VI-29.

TABLE VII-2A
INCOME ALLOCATION TO PRODUCTION FACTORS FOR
RICE GROWING IN NONG SUA, WET SEASON,
CROPPING INTENSITY 100 PERCENT

Years	Gross Income	Net Income Per Rai	Factor Allocation per rai				
			Capital	Labor	Management	Land	Water
0	473	320	13	132	47	128	0
1*	880	404	22	320	88	--	--
3	915	509	22	320	92	65	--
5	950	546	22	320	95	109	--
8	1144	715	22	320	114	163	96
10	1190	757	22	320	119	163	133
13	1377	909	22	320	138	163	266
15	1417	939	22	320	142	163	292
20	1639	1142	22	320	164	163	473
25	1639	1142	22	320	164	163	473
Year '0' Broadcast							
Year '1' Transplant							

*Year for lime application.

Source: Calculations based on listed assumptions and Table VI-24.

TABLE VII-2B
INCOME ALLOCATION TO PRODUCTION FACTORS FOR
RICE GROWING IN NONG SUA, DRY SEASON

Year	Net Income					Factor Allocation, Baht per rai				
	Gross Income	Net Income	Cropping Intensity %	per cul- tivated rai	rai	Capital	Labor	Management	Land	Water
0	796	457	16	72	72	2	51	13	--	7
1	1144	688	30	206	206	3	96	34	35	38
3	1188	732	30	220	220	3	96	36	35	50
5	1232	778	50	389	389	10	160	62	35	122
8	1417	934	50	467	467	10	160	71	35	191
10	1452	965	75	724	724	14	240	109	35	326
13	1624	1112	75	834	834	14	240	122	35	423
15	1650	1128	75	846	846	14	240	124	35	433
20	1760	1250	85	1063	1063	16	272	150	35	590
25	1760	1250	85	1063	1063	16	272	150	35	590
Year '0'	Transplant - from main irrigation system									
Year '1'	Transplant - from on-farm system									

Source: Calculations based on listed assumptions and Table VI-24.

TABLE VII-2C

INCOME ALLOCATION TO PRODUCTION FACTORS FOR
RICE GROWING IN WET & DRY SEASON

Year	Gross Income	Net Income	Cropping Intensity %	Net Income per cul- tivated rai	Factor Allocation, Baht per rai					Charge- able Amount
					Capital	Labor	Management	Land	Water	
0	1269	771	116	392	15	183	60	128	7	--
1	2024	1092	130	610	25	416	122	35	38	31
3	2103	1241	130	729	25	416	128	100	50	43
5	2182	1324	150	935	32	480	157	144	122	115
8	2561	1649	150	1052	32	480	179	184	177	170
10	2642	1722	175	1481	36	560	228	198	459	452
13	3001	2021	175	1743	36	560	260	198	689	682
15	3067	2067	175	1785	36	560	266	198	725	718
20	3399	2392	185	2205	38	592	314	198	1063	1056
25	3399	2392	185	2205	38	592	314	198	1063	1056

Source: Calculations based on listed assumptions and Table VI-24.

Capital

Most of the equipment used by farm families involves the acquisition and use of traditional implements, such as, wooden ploughs, harrows, and threshers. Tractors are used by many operators for land preparation, but these tractors are owned by relatively few individuals. Expenses incurred for land preparation have been treated as a production cost. Returns to capital will deal with the returns to variable capital and not to fixed capital in land, buildings, or water structures. Returns to capital will be attributed to the investment in traditional implements and capital involved in the purchasing of seeds, fertilizer, insecticides, and hired labor.

The ALRO has no field data on the annual investment in traditional equipment by a farmer. From the experience of ILACO in the Central Plains, investigation has shown that investment is approximately 50 Baht per rai. If the interest rate is assumed to be 12 percent per annum, the return to this portion of capital is figured to be six Baht per rai per year.¹ It will be assumed that the same traditional equipment will be used throughout the life of the project.

An interest rate of six percent per planting season was used to determine returns to capital for seed, fertilizer, etc. The return for Ban Na would be about 28 Baht per rai per year and for Nong Sua approximately 18-20 Baht per rai. Though expenditures for these factors increase over the life of the project, these returns will remain constant throughout the life of the project. Total returns to capital will be approximately 34 Baht in Ban Na and range from 25-38 Baht in Nong Sua depending on the cropping intensity.

¹ILACO, Chao Phya (sic), p. 362.

Management

New rice production methods and vegetable farming require more management skills on the part of the farmer in organizing labor and making decisions. For this reason, the returns to management should increase over time as the farmer displays more ability in running his farm. International standards fix the return to management at five percent of the gross income.¹ Most U.S. management expects around ten percent return to management. Because of the need for sound management, skills returns to management will be set at ten percent of gross income. This should be a helpful incentive to farmers who are not sure about changing farming practices.

Labor

As cultivation shifts from broadcast methods to transplanting techniques, more man hours of labor are required. The majority of farm surveys available do not look at labor input requirements. Again, reliance must be put on field data collected by ILACO in their project areas. Table VII-3 presents their data for labor requirements in man hours per rai for rice.² In going from broadcast practices to transplanted improved varieties, the labor requirement almost triples.

Unskilled labor wages are set by the government at 18 Baht per day assuming an eight hour work day. A fair remuneration to a farmer would be 20 Baht per day for eight hours work. Using this as a base, a broadcast farmer would return about 132 Baht to his labor while a farmer transplanting rice would return about 320 Baht to his labor. (For these

¹Ibid., p. 364.

²Ibid., p. 363. Miss Tipaporn also presents labor requirements in her thesis but the ILACO data are more appropriate for meeting the requirements of this study.

calculations in Table VII-2 an average of 128 hours per rai transplanted has been used.) In the initial calculations the wage rate has been held constant over the life of the project. Undoubtedly the value of labor will increase over time. In Table VII-7, the chargeable amounts for water has been recomputed assuming the returns to labor increase at 2 percent and 3 percent per year respectively.

TABLE VII-3
LABOR REQUIREMENTS IN MAN-HOURS PER RAI FOR RICE

Cultivation Practice	Project Year	Labor Requirements
Broadcast		
Rainfed	0	53
Irrigated	0	60
Irrigated	10	64
Transplanted, Local Rice		
Rainfed	0	107
Irrigated	0	122
Irrigated	10	125
Transplanted, HYV		
Wet Season	0	126
	10	130
Dry Season	0	136
	10	155

Source: ILACO, Chao Phya (sic), p. 363.

Labor requirements for vegetable farming are quite different than rice farming. The labor requirements of 179 man hours per rai, as shown in Table VI-25, will be used for vegetable farming. At 20 Baht per eight hour day, the return to labor will be approximately 448 Baht per rai. In Table VII-6, the chargeable amount for water has been refigured assuming the returns to labor increase at 2 and 3 percent respectively.

Land

After factoring out the above items, the remaining portion of the net income can be considered the land rent, as described in Chapter IV. Actually, the return to land will be divided into two parts: land and water. Under rainfed conditions, the return to land in year '0' is the remaining portion after allocating returns to capital, labor, and management. Later, after on-farm development, any portion over and above the return to land is attributed to water.

In Nong Sua with two cropping seasons, the land portion was determined in the wet season under the rainfed conditions in year '0'. During the dry season, almost the whole return to land is allocated to water. Finally, both cropping seasons were added together to obtain one chargeable amount. In the year '0' of the dry season, water received an allocation of seven Baht per rai which has been subtracted out of the remaining water portions after project implementation as found in the chargeable amount column of Table VII-2C.

Nong Sua farmers will initiate land improvement practices through liming along with the on-farm irrigation system. Also, land leveling will generate a higher return to land if included in the project design. For the calculations in this chapter, the land improvements from liming are much more important.

It is difficult to assign a precise amount to the value of liming. Yield increases of 100 kilograms are expected. A rough approximation would value liming practices at 70 Baht per rai returning at least the expense of the lime to the farmer. This has been split evenly between the dry and wet season, 35 Baht for each season. This is a rather

arbitrary assumption and should be changed to reflect the actual value of liming once more data are available.

There is no reference point to work from in vegetable farming like the rainfed conditions in rice farming. Water is a critical input and few vegetables can be grown without it. When factoring the return to land between land and water, it will be assumed that each component shares equally (50-50) in the return. Until more research has been done on vegetable farming, this assumption will have to hold though it may be very questionable.

Repayment Capacity

To accurately present the present value of future chargeable amounts, the return to water has been discounted by 8, 10, and 12 percent. The discount rate should reflect the opportunity cost of capital. In most developing countries, the discount rate generally ranges between 8 and 15 percent.¹ The eight percent rate corresponds closely to the borrowing rate for the project (eight percent is also the interest rate on government bonds used to purchase land) which is another criteria which can be used to select this discount rate. Both 10 and 12 percent have been assumed to be illustrative of the opportunity cost of capital in Thailand.

Tables VII-4 and VII-5 present the discounted chargeable amounts for the first 25 years of the project. In the next two tables, VII-6 and VII-7, adjustments have been made in the chargeable amount to reflect yearly increases in the returns to labor of two and three percent. These figures have also been discounted at the same discount rates.

These discounted figures represent the repayment capacity of the farm or the maximum amount the farmer can be expected to repay each year

¹Gittinger, Economic Analysis, p. 61.

TABLE VII-4
CHARGEABLE AMOUNTS FOR WATER DISCOUNTED AT 8, 10,
12 PERCENT FOR BAN NA

Year	Chargeable Amount	Discounted at		
		8%	10%	12%
1	358	332	325	320
2	393	337	325	313
3	393	312	295	280
4	1293	950	883	822
5	1288	877	800	730
6	1253	789	707	635
7	1288	751	661	582
8	2188	1182	1022	884
9	2181	1091	925	787
10	2181	1010	842	702
11	2147	921	751	616
12	2181	866	696	561
13	2181	803	632	499
14	2181	742	574	447
15	3082	971	737	564
16	3047	890	664	497
17	3081	832	610	450
18	3081	770	555	401
19	3081	715	505	357
20	3081	662	459	320
21	3047	606	411	283
22	3081	567	379	255
23	3081	524	345	228
24	3081	487	314	203
25	3081	450	283	181

Source: Table VII-1 and discount tables in Gittinger, Economic Analysis, p. 212.

TABLE VII-5
CHARGEABLE AMOUNTS FOR WATER, DISCOUNTED AT 8, 10,
12 PERCENT FOR NONG SUA

Year	Chargeable Amount	Discounted at		
		8%	10%	12%
1	31	29	28	28
2	37	32	31	29
3	43	34	32	31
4	49	36	33	31
5	115	78	71	65
6	170	107	96	86
7	254	148	130	115
8	280	151	131	113
9	309	154	131	112
10	452	209	174	146
11	559	240	196	160
12	655	260	209	168
13	682	251	198	156
14	708	241	186	145
15	718	226	172	131
16	847	247	185	138
17	946	255	187	138
18	970	242	175	126
19	1002	232	164	116
20	1056	227	157	110
21	986	196	133	92
22	1056	194	130	88
23	1056	180	118	78
24	1056	167	108	70
25	1056	154	97	62

Source: Table VII-2C and discount tables in Gittinger, Economic Analysis, p. 212.

TABLE VII-6

BAN NA

CHARGEABLE AMOUNTS FOR WATER ASSUMING INCREASE IN LABOR
WAGE OF 2 and 3 PERCENT, PER YEAR, DISCOUNTED
AT 8, 10, and 12 PERCENT

Year	Chargeable Amount-2%	Chargeable Amount-3%	Discounted At					
			8%		10%		12%	
			2%	3%	2%	3%	2%	3%
1	340	331	314	307	309	301	304	296
2	357	338	306	279	295	307	285	269
3	338	309	268	245	254	232	240	220
4	1219	1180	896	867	833	806	775	750
5	1195	1144	814	779	742	710	678	649
6	1140	1078	718	679	643	608	578	545
7	1155	1081	673	630	592	554	522	489
8	2034	1948	1098	1051	950	910	821	787
9	2006	1907	1003	954	851	809	724	688
10	1963	1872	909	867	758	723	732	603
11	1929	1802	828	773	675	631	554	517
12	1941	1799	771	714	619	574	499	462
13	1918	1761	706	648	556	511	439	403
14	1895	1722	644	585	498	453	388	353
15	2772	2582	873	813	663	617	507	473
16	2713	2505	792	731	591	546	442	408
17	2722	2496	735	674	539	494	397	364
18	2697	2452	674	613	485	441	351	319
19	2671	2406	620	558	438	395	310	279
20	2645	2358	569	507	394	351	275	245
21	2584	2275	514	453	349	307	240	212
22	2591	2248	477	414	319	277	215	187
23	2553	2196	434	375	286	246	189	163
24	2525	2142	399	338	256	218	167	141
25	2496	2037	364	305	230	192	147	123

Source: Based on listed assumptions, Table VII-1 and discount tables in Gittinger, Economic Analysis, p. 212.

TABLE VII-7

NONG SUA

CHARGEABLE AMOUNTS FOR WATER, ASSUMING INCREASE IN LABOR
WAGE OF 2 AND 3 PERCENT, PER YEAR, DISCOUNTED
AT 8, 10, and 12 PERCENT

Year	Chargeable Amount-2%	Chargeable Amount-3%	Discounted at					
			8%		10%		12%	
			2%	3%	2%	3%	2%	3%
1	23	19	21	18	21	17	21	17
2	21	12	18	10	17	10	17	10
3	18	5	14	4	14	4	13	4
4	15	--	11	--	10	--	10	--
5	71	47	48	32	44	29	40	27
6	116	86	82	54	65	49	59	44
7	189	153	110	89	97	78	85	69
8	204	162	110	87	95	76	82	65
9	222	163	111	82	94	69	80	59
10	352	295	163	137	136	114	113	95
11	446	380	191	163	156	133	128	109
12	529	454	210	180	169	145	136	117
13	542	458	199	168	157	133	124	105
14	554	460	188	156	146	121	114	94
15	550	446	173	141	131	107	101	82
16	664	549	194	160	145	120	108	89
17	747	621	202	168	148	123	109	91
18	755	617	189	154	134	111	98	80
19	771	621	179	144	126	102	89	72
20	809	646	174	139	121	96	74	67
21	705	546	140	109	95	74	66	51
22	775	585	142	108	95	72	64	49
23	758	553	129	94	85	62	56	41
24	740	521	117	82	75	53	49	34
25	722	487	105	71	66	45	43	29

Source: Based on listed assumptions, Table VII-2C, and discount tables in Gittinger, Economic Analysis, p. 212.

over the life of the project. Before determining repayment periods and assessing charges, cost estimates must be presented.

Cost Estimates

Various estimates of investment costs are available depending on the design of the project. Cost data are available from the Sappaya project, Chao Phya (sic) project, and the RID projects. Each project requires different levels of project investment. The Sappaya approach is very intensive and requires a large amount of capital. This approach is too costly to be considered by the ALRO. Cost estimates will be based on the other project experiences. Estimates for these alternatives have been presented in Table VII-8.

Quite a difference exists between these two alternatives. The Chao Phya (sic) design calls for land leveling, but the RID tries to design its projects so land leveling is not necessary. The Dutch estimates also include an optional cost for rehabilitation of the main system. The RID cost estimates are much lower than the Dutch--less than half without rehabilitation. Current project designs in the ALRO are basically following the RID approach. For Nong Sua, the Dutch have been asked to prepare the irrigation design. In this case, it has been assumed that the estimates in alternative 1 are more applicable.

No costs estimates are available for the Ban Na project. Irrigation work of this kind has not been attempted before by a government agency. Almost all vegetable farming layouts have been done by the farmers themselves. In Ban Na, the government will build the dike, major canals and farm canals and the farmer will build the beds and bed ditches. ALRO officials expect the costs to be high especially for the dike, but as

TABLE VII-8

COST ESTIMATES FOR ON-FARM DEVELOPMENT, BAHT PER RAI

ALTERNATIVE 1		ALTERNATIVE 2	
Costs for On-Farm Development in Chao Phya (sic) Consolidation Project		Cost Estimates for RID Projects	
Items	Baht	Items	Baht
Survey & Issue Title		Surveying	18
Deed	70	Design	30
Design & Engineering	55	Land Clearing	50
Land Clearing	70	Making elevation for reference point	
Land Leveling	520	for digging canal	40
Road Construction	320	Construction of road & canals	535
Excavation of drains & ditches	90	Structures	40
Structures	110	Construct pipe to paddy field	25
Supervision & Administration	85		638
	1,320		
Rehabilitation of main system	300		

Source: ILACO, Chao Phya (sic), p. 366 and mimeo from
Engineering Section, ALRO.

yet cannot be specific. A conservative estimate would put costs between 1,000 - 1,500 Baht/rai. For the purposes of this study, costs of 1,250 Baht/rai will be used.

First costs to be collected will be operation and maintenance cost for on-farm irrigation works. O & M is assumed to be 20 Baht per rai.¹ Other O & M costs for headworks and the main system have not been considered at this stage of the analysis.

All the costs specified for repayment under the Land Consolidation Act have not been considered in these alternatives. Cost for installing public utilities, other than roads, have not been itemized here, as decided upon in Chapter V. Even if these costs were to be recovered, required investments for these activities are presently not available.

In the discussion on costs, it was assumed that the government would subsidize the cost of construction up to 35 percent. Table VII-9 shows the amounts that would be charged to farmers at different subsidy levels. The Land Consolidation Act states that the government would subsidize at least 10 percent, possibly more after consideration by the Land Consolidation Committee. Consideration will be given to other possible subsidy levels. Alternative 2 has been presented for projects without rehabilitation costs for the main system being included (2a) and with these costs included (2b).

Cost-Recovery

Each project site will have a different recovery period, depending on how the investment costs compare with the chargeable amounts. For this reason, Ban Na and Nong Sua will be described separately below. For each site, an appropriate grace period will be decided upon as will the

¹ILACO, Chao Phya (sic), p. 366.

type of collection procedure--either one set amount over a period of years or a gradually increasing amount each year.

TABLE VII-9

COSTS: AT VARIOUS LEVELS OF GOVERNMENT SUBSIDIES,
ASSUMING NO INTEREST CHARGES ON
INVESTMENT IN BAHT/RAI

Level of Subsidy	Cost Charged to Farmer		Ban Na Project
	Alternative 1	Alternative 2 (a) (b)	
0	638	1,320 1,620	1,250
10%	574	1,188 1,458	1,125
20%	510	1,056 1,296	1,000
30%	447	924 1,134	857
35%	415	858 1,053	812
40%	383	792 972	750
50%	319	660 810	625
60%	255	528 648	500
70%	191	396 486	375
80%	128	264 324	250
90%	64	132 162	125

Source: Calculations based on listed assumptions.

Ban Na

Table VII-10 briefly summarizes the data presented in Tables VII-4 and VII-6. The cost for on-farm O & M, 20 Baht per rai has been subtracted out of these figures leaving the amount available to charge against on-farm investments.

Participants in this project should have a grace period of three to five years before payments for on-farm development should begin. Farmers will need a few years to adjust to the new farming system. Production will likely level off in about five years after the initial year of the project. If the government subsidizes 35 percent of the costs, farmers will be able to repay for investments in one or two years if the whole chargeable amount is captured after the grace period.

TABLE VII-10

CHARGEABLE AMOUNTS FOR WATER LESS O & M COSTS
FOR ON-FARM SYSTEM IN BAN NA, BAHT/RAI

Annual % Increase to Returns of Labor	Years	Chargeable Amounts Discounted At		
		8%	10%	12%
0	5	857	780	710
	10	990	822	682
	15	951	717	544
	20	642	439	300
	25	430	263	161
2	5	794	722	658
	10	889	738	612
	15	853	643	487
	20	549	374	255
	25	344	210	167
3	5	759	690	629
	10	847	713	583
	15	793	597	453
	20	487	321	225
	25	285	172	103

Source: Calculations based on listed assumptions.

Because there are still a number of uncertainties associated with the project, particularly soil potential and the possibility of crop failure, the best procedure would be to collect a set amount from the year the farmer levels off production (third to fifth year) until the investment costs are recovered. If a 100 Baht fee was levied each year, investment would be recovered in eleven to thirteen years after the project begins. This is an acceptable repayment period. If the government decided investment costs were to be recovered by the tenth year of the project, payments of 116 Baht would have to be received from year three or 162 Baht from year five to meet the deadline.

Under conditions of an increasing labor wage, beneficiaries can still meet scheduled payments of between 100 and 162 Baht. Because the projected returns are high per rai, farmers still have funds even at high discount rates to cover project investments.

If the vegetable farming projections are realistic it would appear that the capital recovery rate would be fast enough to satisfy the government and the farmers would still benefit from the program. The grace period is short enough that the farmers will not neglect their obligations and keep them involved in the project. Another good indicator is that O & M costs can be recovered each year. It is likely that O & M costs have been understated for this project because of the systems continual use. Higher costs for O & M can be handled by the farmers. A fair assessment would be that a project of this kind would be beneficial to both farmers and the government. Again, the one big question seems to be the area's potential in supporting vegetable farming.

Nong Sua

Table VII-11 summarizes the data presented in Tables VII-5 and VII-7. The O & M cost, 20 Baht per rai, for the on-farm system has been subtracted from the original figures. For this project, cost alternative 2 will be used as the most reflective of actual project investment.

By capturing the total remaining chargeable amount, assuming a constant wage rate and a four year grace period, 90 percent of the investment funds (alternative 2a) can be recovered in the 13th, 14th, and 17th year of the project with discount rates of 8, 10, and 12 percent, respectively. An additional year is needed in each case to collect the cost of rehabilitating the main system. In this case, investments can be recovered in 9 to 12 years after the grace period, an acceptable repayment period.

TABLE VII-11

CHARGEABLE AMOUNTS FOR WATER, LESS O & M COSTS
FOR ON-FARM SYSTEM IN NONG SUA,
BAHT/RAI

Annual % Increase to Returns of Labor	Years	Chargeable Amounts Discounted At		
		8%	10%	12%
0	5	58	51	45
	10	189	154	126
	15	206	152	111
	20	207	137	90
	25	134	77	42
2	5	28	24	20
	10	143	116	93
	15	153	111	81
	20	154	101	64
	25	85	46	23
3	5	12	9	2
	10	117	94	75
	15	121	87	62
	20	119	76	47
	25	51	25	9

Source: Calculations based on listed assumptions.

At increased levels of returns to labor the projected repayment periods are slightly longer. For an increase of two percent in labor returns, repayments would be made by the 15th, and 17th year of the project at discount rates of eight percent and ten percent respectively. These repayments would cover both alternatives 2a and 2b. Between 17 and 22 years are needed if returns to labor increase by three percent and are discounted at eight percent and ten percent respectively. With chargeable amounts discounted at 12 percent, three or four additional years will be needed to pay off costs.

Subsidizing costs up to 35 percent, farmers can repay the remaining costs within seven to ten years (11th to 14th project year) from initiating

payments assuming a constant return in labor at discount rates of 8, 10, and 12 percent. Moreover, assuming an increase of two percent in returns to labor, it would take an additional two years to repay on costs and an additional four or five years if returns to labor increased by three percent.

Under a program whereby participants repay a specified amount which increased over the project each year at a constant return to labor, a five year grace period, and discounted at eight percent, the investment costs could be recovered within almost the same amount of time. For example, collecting 50 Baht in year five, 75 Baht in year six, 100 Baht in years seven through nine, 150 Baht in year ten, and 200 Baht in years 11-14, 65 percent of the costs are recovered by year 12 and 90 percent by the end of year 14 (alternative 2a). Assuming higher discount rates would mean a longer repayment schedule, but investments could be recovered by the 20th year of the project.

Table VII-12 looks at two types of repayment schedules and how they compare in length of time needed to make repayments of 65 percent of the investment costs. A fixed schedule collects a set fee every year. In this example, at a constant return to labor, 50 Baht has been charged in year five, 75 Baht in year six, 100 Baht in years seven through nine, 150 Baht in year ten, 200 Baht in years 11-14, and 100 Baht in years 15-20. When labor returns increase at two percent annually, a slightly different schedule has been set up, whereby 25 Baht is collected in year five, 50 Baht in year six, 75 Baht in years seven through nine, 125 Baht in year ten, and 150 Baht in years 11-20. Higher fees could be set in both cases during the middle years of the project. The amounts selected here have been arbitrarily selected. The other type of schedule which captures the whole chargeable amount available each year is referred to

TABLE VII-12

CUMULATIVE PAYMENTS AS A PERCENT OF TOTAL COSTS,
 ASSUMING PAYMENT OF 65 PERCENT OF THE COSTS
 BY NONG SUA FARMERS AND EITHER A FIXED
 OR VARIABLE SCHEDULE

Year	Constant Return to Labor				2% Increase in Returns to Labor			
	Fixed Schedule		Variable Schedule		Fixed Schedule		Variable Schedule	
	8%	% Repaid	8%	% Repaid	8%	% Repaid	8%	% Repaid
1	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--
5	50	5	58	6	25	3	28	3
6	125	13	145	15	75	8	90	9
7	225	23	273	28	150	15	180	18
8	325	33	404	41	225	23	270	28
9	425	44	538	55	300	31	361	37
10	575	59	727	75	425	44	504	52
11	775	70	947	97	575	59	675	70
12	975	100	1187	122	725	75	865	89
13	1175	120	1418	136	875	90	1044	108
14	1375	141	1639	169	1025	105	1212	124
15	1475	152	1845	190	1175	120	1365	140
16	1575	160	2072	213	1325	136	1539	158
17	1675	170	2327	239	1475	151	1621	167
18	1775	180	2569	264	1625	166	1790	184
19	1875	190	2801	285	1775	182	1949	200
20	1975	200	3028	310	1925	198	2103	216

Source: Based on data found in Table VII-5 and VII-7.

as the variable schedule. In this table, the amounts paid are presented as a running total. The column heading 'percent repaid' refers to the cumulative payments in year X as a percent of investment costs to be repaid. For example, in year seven of a fixed schedule (at constant labor returns) a total of 225 Baht (50 Baht year five plus 75 Baht year six plus 100 Baht year seven) has been repaid. This is 23 percent of the total amount which has to be repaid.

It can be seen that with a fixed schedule it would take slightly longer, about one year, to recover investment costs than with a variable schedule. At constant returns to labor, the number of years to make repayments are the same--seven years. When returns to labor are increasing at two percent annually, the repayment period is lengthened and the fixed schedule takes one year longer than the variable. A fixed schedule may be more appropriate as it is easier to set up and is more flexible when uncertainties arise.

The calculations have been carried out to year 20. There is no legal provision that payments must stop after all the investment costs have been recovered. The government may find an annual water charge a useful tool in encouraging farmers to use water more efficiently. Though a decision of this nature may be postponed for awhile, water conservation could well be the agricultural problem facing the nation before too long.

The Nong Sua project seems to have the potential to generate a high enough 'with' project net income to pay for the investment costs. Some doubt still exists as to the real soil potential of the area, but this does not appear to be as serious as in Ban Na. The best approach would be to collect a scheduled fee over a specific period of time to allow for any uncertainties, such as, crop failures or rice price changes.

Land Purchase and Rental Rates

A broader interpretation of the sections of the Land Reform Act dealing with the selling of land to land reform participants has altered the initial position of ALRO officials regarding the original assumption that farmers would rent their lands. Originally only land purchased from private owners would be resold. Land belonging to the public or Crown would be held by the ALRO. In Section 39 the law stipulates that land acquired through land reform can only be transferred to heirs, to a farmer institution, or to the ALRO. This safety feature which prevents land from moving back into the hands of absentee or large landlords appears to satisfy the doubts of government officials who previously felt the government should retain control of public and Crown lands. The prevailing attitude expresses the opinion that the best course of action may be to make farmers full owners. However, the question arises: does the farmer earn enough to pay for the land and to repay investment costs at the same time?

Land acquisition cost incurred by the ALRO in purchasing land from private owners or the Crown will be the price passed on to farmers. In the pilot project area in Ban Na the Crown sold the land for approximately 1,800 Baht/rai. Negotiations have not taken place in Nong Sua yet, but it is expected that the acquisition price will be around 4,000 Baht per rai.

Hire-purchase payments can be paid out of the amount allocated to the land factor in Tables VII-1 and VII-2C for Ban Na and Nong Sua respectively. The factor share will have to be discounted to reflect present values. Discounted values for Ban Na can be found in Table VII-4 since the land and water factors are the same. Table VII-13 lists the

discounted values for the Nong Sua area. No adjustments have been made for increases in the return to labor as these increases were absorbed by the water factor.

The situation is unclear in Ban Na. The returns to the land in vegetable farming is high enough to purchase the three rai involved in this activity. It is questionable whether the returns to the 22 rai in rice production will be high enough to allow for large payments for land purchase. The expected returns to rice land is not expected to be higher than 230 Baht/rai. Discounted, this amount would have an approximate value of between 100 and 150 Baht per rai between years four and twelve of the project. Farmers may want to use returns to vegetable farming to pay for their rice field. If 150 Baht is collected per rai, it would take the farmer approximately thirteen years to purchase the land.

If the price of land in Nong Sua sells at a high price, it appears that the farmers may have problems in purchasing the land. Discounted at eight percent, the chargeable amount for land is only about 100 Baht per rai for years four through eleven. This totals only 800 Baht which is far short of the acquisition price. To purchase the land by the fifteenth year of the project, farmers would have to pay 265 Baht a year assuming the costs was 4,000 Baht/rai. If the purchase period was extended to twenty years, the farmers would have to pay 200 Baht or twice the amount of the amounts listed in Table VII-13.

A subsidy may have to be given Nong Sua farmers if the ALRO expects the farmers to purchase land. This may be even more important if payments for land purchase and on-farm development reduce net income substantially that income targets are not met.

TABLE VII-13
CHARGEABLE AMOUNT FOR LAND DISCOUNTED AT
8, 10, AND 12 PERCENT, NONG SUA

Year	Chargeable Amount	Discount Rate		
		8%	10%	12%
1	35	32	32	31
2	95	81	78	76
3	100	79	75	71
4	127	93	87	81
5	144	98	89	82
6	184	116	104	93
7	198	115	102	89
8	198	107	92	80
9	198	99	84	71
10	198	92	76	64
11	198	85	69	57
12	198	79	63	51
13	198	73	57	45
14	198	67	52	41
15	198	62	47	36
16	198	58	43	32
17	198	53	39	29
18	198	50	36	26
19	198	46	32	23
20	198	43	30	21
21	198	39	27	18
22	198	36	24	16
23	198	34	22	15
24	198	31	20	13
25	198	29	18	12

Source: From Table VII-2C and discount tables, Gittinger, Economic Analysis, pg. 212.

For those farmers who opt to rent their land, a fair rental rate for both areas would be between 70 and 100 Baht per rai. It may be best to have the farmers pay a lower rate during the initial period, i.e., years one to five, and then increase the rate once production levels off which is expected in year five.

For those previously paying in kind, this rental range is slightly less than the rental rate before the project. The range of 70 to 100 Baht/rai is almost the same as cash payments were before the project. One would speculate that farmers would not object to paying rents at this level.

Target Income

Even though the government wants to recover investment costs and will encourage the farmers to purchase their land, the projects are expected to generate enough returns per rai so that farmers will receive at least a minimum target income. An acceptable annual income range would be between 15,000 to 40,000 Baht. ALRO officials hope to achieve a minimum income of 20,000 Baht in the reform areas.

Table VII-14 has been prepared to show yearly incomes after charges for on-farm development and land purchase have been deducted. Farmers will also be responsible for O & M costs which would be collected prior to other charges. Assuming a charge of 20 Baht/rai for O & M, farmers in Ban Na would be assessed 50 Baht and in Nong Sua 500 Baht a year. These charges have also been deducted from yearly income beginning in the second year of the project.

For Ban Na, the total yearly net income listed in Table VI-30 has been reduced by the annual charges for O & M, land and water. Fees of a 100 Baht per rai for land purchase and 100 Baht per rai for on-farm

TABLE VII-14
YEARLY INCOME AFTER CHARGES FOR PROJECT RECIPIENTS
IN BAN NA AND NONG SUA

Year	Ban Na			Nong Sua		
	Yearly Net Income from Vegetables & Rice	Yearly 0 & M, Land and Water Charges	Remaining Income	Yearly Net Income	Yearly 0 & M, Land and Water Charges	Remaining Income
1	14,813	---	14,813	27,300	---	27,300
2	16,660	50	16,610	30,070	500	29,570
3	16,814	50	16,764	31,025	500	30,525
4	21,968	50	21,918	32,025	500	31,525
5	21,616	5,050	16,566	33,000	8,000	25,000
6	19,835	5,050	14,785	37,680	8,000	29,680
7	21,704	5,050	16,654	40,325	8,000	32,325
8	26,856	5,050	21,800	41,325	8,000	33,325
9	27,012	5,050	21,962	42,300	8,000	34,300
10	27,826	5,050	22,776	43,050	8,000	35,050
11	26,089	5,050	20,939	47,125	8,000	39,125
12	28,002	5,050	21,368	49,675	8,000	41,675
13	28,002	2,550	25,650	50,525	8,000	42,525
14	28,398	2,550	25,848	51,350	5,500	45,850
15	33,596	2,550	31,046	51,675	5,500	46,175
16	31,859	2,550	29,309	53,850	5,500	48,350
17	33,772	2,550	31,222	56,450	5,500	50,850
18	33,970	2,550	31,420	57,200	5,500	51,700
19	33,968	2,550	32,418	58,150	5,500	52,650
20	34,366	2,550	32,816	59,800	5,500	54,300
21	33,191	2,550	31,631	59,625	5,500	54,125
22	34,366	2,550	23,816	59,800	5,500	54,300
23	34,366	50	34,316	59,800	5,500	54,300
24	34,366	50	34,316	59,800	5,500	54,300
25	34,366	50	34,316	59,800	500	59,300

Source: Tables VI-30 and VII-2C.

development have been collected each year after a four year grace period. The time period to purchase the land and to repay 65 percent of the investment cost will be 18 and 8 years, respectively.

For Nong Sua the net income found in Table VII-2C has been multiplied by 25 rai to obtain total yearly net income. This figure has been reduced by charges of 200 Baht/rai for land purchase, 100 Baht/rai for on-farm development, and the previously mentioned O & M costs. After a four year grace period, land purchase will be completed in 20 years and repayment of 65 percent of the investment costs will be completed in nine years.

In both cases, it appears that farmers' incomes will be within the target income range. It will take Ban Na farmers about seven years before income levels off at above 20,000 Baht. Nong Sua farmers appear to have a solid income of between 30,000 and 40,000 Baht annually. These figures have not been discounted so they do not reflect present values.

In comparing with the average current incomes received in the project areas with those expected with the projects, it appears that in Ban Na the incomes will be about the same until year eight. Current income from rice is about 16,000 Baht but the farm sizes are 10 to 25 rai larger. If the participant must give up off-farm sources of income, the project may not be as favorable to him until about the tenth year of the project. Probably most civil service jobs will be retained and this income plus 'with' project income may make the project appear more favorable to the farmer. If the returns to vegetable farming are greater than the farmer's opportunity cost for off-farm employment, the farmer will probably participate in the project.

The large farm units which currently exist in Nong Sua distort the income picture when compared with 'with' project incomes. A 25 rai 'with' project unit will be earning yearly income comparable to what is now earned on units four times larger. Tenant incomes will be improved the most as a result of the project though owners will not realize the same income from rice until the fifteenth year of the project. Since owner-operators will not have to give up too much of their land (they will be allowed to retain at least a 100 rai), their incomes will certainly increase through year round irrigation. Again, the opportunity cost of off-farm income will play an important role in whether farmers will participate in the project, but not as much as in Ban Na. Rice farmers should be able to engage in most off-farm activities throughout the year. Only a few activities may have to be given up which may not seriously effect income.

Based on the assumptions and expectations in this analysis, minimum income targets will probably be achieved in the project areas. With proper extension and cooperative assistance, it appears that over time farmers' incomes will steadily improve. At the same time, farmers will be able to meet their obligations with respect to investment costs and land purchase.

Collection of Charges

Two additional questions still need to be answered: How much should farmers be charged and who should act as the collection agency? This paper has already addressed the question of whether the government is justified in charging for on-farm development. From the figures presented in the previous sections, it appears the project participants will receive an adequate remuneration to all the resources they use in the production

process. Since the government will develop the water resources, claims made on part of the benefits seem justifiable. Also, water is becoming more of a scarce resource which should not be put at the disposal of a limited group of people without some arrangements for payment. It would be socially unjust to let a few farmers prosper at the expense of others. To avoid any misconceptions the charges levied should not be construed as taxes.

The establishment of a collection system and a collection agency are political decisions. Only a few suggestions will be given here.

Two collection systems have been identified: a fixed predetermined schedule and charging according to the full amount of the repayment capacity. The latter method requires a lot of work since yields will have to be measured each cropping season and production costs and the rice price will have to be checked periodically. Yields and prices will fluctuate frequently causing the chargeable amounts to vary every year. This type of system would be difficult to manage. A more fixed schedule should be opted for as suggested in the preceeding sections.

The examples already presented in this chapter have increased charges over the life of the project as farmers' income improves. One problem which may be encountered with this approach will be in justifying increases to the farmers. Unless rules have been prepared prior to the project, periodic increases in charges may lead to misunderstandings.

Two other options are available. First, charges can be set high during the early phases of the project and then gradually taper off, i.e., during years five and six charge 150 Baht, years seven and eight 100 Baht, and 50 Baht in each year thereafter. A second approach would have the government specify the time period in which costs must be recovered. If the time limit is set at 15 years, a charge of 55 Baht can

be levied each year assuming investment costs of 800 Baht/rai. For a shorter time period, the rates would be slightly higher.

Consideration should be given to the fact of any drop in yields or in the rice price would effect the chargeable amount. A drop to 1.8 Baht/kg in the rice price would cause the chargeable amount in Nong Sua to drop between 50-100 percent. If cropping intensities cannot be maintained, the reduction in expected yields could seriously effect chargeable amounts. This is due to the fact that the water factor is the last factor which is allocated returns and would absorb any of the effects of shifts in prices or yields. For this reason, a fixed schedule should remain flexible so changes can be made in the predetermined charges.

In regards to when the actual payments should be made, there is a strong case for making two payments a year, one after the wet season and one after the dry season. This avoids collecting the charges from one crop which may not be as productive as expected.

Three charges are being collected at the same time: O & M costs, investment costs, and land purchase. A number of organizations could be involved in handling these charges. The RID may feel responsible for O & M charges, the ALRO or the BAAC, depending on the source of project funds, for the investment costs, and the ALRO for the land purchase. A very confusing situation may arise if farmers have to run to different agencies to pay their fees.

Since all project farmers must join the cooperative established in the project area, a special collecting section, under the direction of the ALRO could be set up in the cooperative. Farmers would pay their fees directly to this section which in turn would distribute the fees according to the different categories of charges. This has two advantages: (1) it simplifies the payment procedure for farmers, and (2) it provides

the ALRO with more internal control over the functioning of the project. One difficulty may be in finding qualified personnel to run the collecting section.

This alternative would not be feasible in a project area where farmers are not required to join a cooperative. In this case, the collecting agency would have to be a group of government departments collecting their own specific fees.

One word of caution: the collecting section should not be closely tied to the other services in the cooperative. A close tie may curtail growth of the other functions of the cooperative especially if discrepancies or problems arise over charges. Since the ALRO will be directly supervising the cooperative, they have the ability to keep the collection section separate.

Summary

In this chapter the repayment capacity of project beneficiaries has been determined for a number of pertinent cases. The results are by no means the appropriate answer, but the results provide some guidelines from which the ALRO can base their charges. It appears that if crop yields are as high as expected, rice prices remain around 2.2 Baht/kg, and farmers can adapt to new technologies, farmers will be able to purchase their allocated land, meet O & M expenses, and make payments on investment costs.

The approach taken in calculating the repayment capacity follows closely to the method used by ILACO in the Chao Phya (sic) land consolidation project though a number of the assumptions have been altered to meet the particular characteristics of the land reform projects and the concept of land rent has been followed much more closely. After actual

'with' project data has been gathered, the ALRO may consider using the formulae presented in Chapter IV to determine if the prevailing conditions, i.e., yield and prices, actually warrant the charges being levied on the farmers. Since the data used in this report is based on assumptions and not actual field surveys, no attempt has been made to use the ILACO formulae. Yet, it should be kept in mind that these formulae are useful in monitoring the actual field situation.

The statistical indices of the World Bank are helpful in seeing what the costs incurred by the public sector are and what effects payments have on income distribution. Using the ratio for the cost-recovery index in Chapter V the public incurs a cost of 30 to 35 percent of the public investment. This can be expected since the government will be subsidizing the projects to that extent. The benefit recovery index shows that farmers in Ban Na pay out 18 percent of their net income in year ten for charges, and in Nong Sua about 14 percent in the same year. As a descriptive tool these indices indicated that beneficiaries receive a good portion of the expected benefits while the government recovers a majority of the costs. A comparison of these percents with those found in Chapter IV (page 48, footnote 1) shows that the ALRO projects could be very favorable to both recipients and the public sector.

Based on the assumptions of this analysis, it is clear that the government will not recover all costs. No mention has been made of the interest on the loans the government will need to finance the projects. Also land taxes have been assumed away. These costs are usually recovered from project beneficiaries in other countries. Thus, the government will only be attempting to partially recover costs. Some priorities should be used to rank costs that should be recovered.

O & M costs are usually always given top priority. Lack of proper maintenance to the irrigation system will effect the productivity of the project. For this reason, O & M costs should be collected first. A serious problem in irrigation development planning is the underestimation of O & M costs. The estimates in this study, 20 Baht/rai, may be too low. By collecting O & M costs first adjustments can be made in the charges reflecting the real situation.

Whether payments for on-farm investment costs or land is given second priority is a political decision. It would be fair to speculate that having each farmer own his land would be the ideal situation. The government may want to move in this direction; if so, priority should be given to land purchase.

Only a few alternatives are available in developing countries to collect charges as prescribed in this chapter. Water metering is not feasible in most countries. One feasible alternative would be to recover costs through an increase in the land tax. Though logical, an approach such as this would present problems in Thailand. The tax laws already favor farmers and any changes would require a revision of the tax laws. These changes would certainly effect individuals who are not involved in irrigation projects or who have built on-farm systems through their own initiative, i.e., Chiang Mai farmers. Public pressure would probably be against any alterations in the tax law.

The approach presented in this chapter may not be the best approach. At least it presents some guidelines and establishes some procedures for cost-recovery which meet the objectives of the ALRO. Other methods may present themselves and each should be examined closely and the merits of each weighed to find the most effective approach.

CHAPTER VIII

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

Landownership is an integral part of any nation's economic, political and social structure. Landownership determines the distribution of wealth, influences political power and public policy decision-making, and establishes a social hierarchy. This implies that economic opportunity and political freedom depend on the control of land resources. Many governments are aware that their existing landownership patterns are skewed in favor of a few at the expense of the total population. As inequities widen, pressures build up which threaten to break the economic, political and social fibers of society.

To adjust or modify the existing rights to land so that more people can enjoy property ownership, nations have carried out land reform programs. These programs have varied from mild regulations which minimize the more exploitative features of the tenure system to complete appropriation of all lands by the state. Since the end of World War II, many developing countries where large numbers of the population rely on agriculture for food and income have initiated land reform programs.

Today, Thailand is faced with increasing pressures throughout the rural sector. Land is rapidly becoming scarce, population pressure continues to increase, yields are low, while rents are high, capital is not readily available, and what does exist is obtained at high interest

rates, modern inputs are not always available when needed, and farm families are unable to advance up the agricultural ladder. To relieve these pressures, the Thai government in 1975 had enacted an agricultural land reform program.

In order to implement the program, the ALRO needed information on the prevailing environment for land reform and guidelines for recovering irrigation investment costs made in behalf of reform beneficiaries. Not having sufficient personnel to conduct this research, the ALRO requested research assistance from the Department of Resource Development, Michigan State University. This study is the result of this request.

This study focused on the institutional setting for land reform and cost-recovery procedures. In the first case, a review of the literature and personal observations provided insights into the factors influencing the behavior of specific institutions within the country. An exploratory approach based on land rent theory and several proposed methods for cost-recovery was utilized to prepare a flexible cost-recovery policy.

The study had several specific objectives. First was a comprehensive examination of the institutional setting for land reform in order to identify the major participants in the land reform implementation process. Among those identified were the religious institution, the monarchy, the political establishment, the rural population, the civilian bureaucracy, and the landlords. Several important behavioral characteristics were identified which influence their perceptions of land reform including: the individualistic nature of each individual in society, the highly structured, hierarchical structures of all institutions,

and the paternalistic attitude of superiors to subordinates. These hierarchical and paternalistic arrangements have contributed to stability and order within the country by maintaining the status quo.

A second objective was to determine the repayment capacity of project recipients. Repayment schedules were based on a with-without project examination of the beneficiaries' income. The net increase in returns was allocated to the various factors of production and the land component was singled out as the portion from which charges would be extracted. The cost-recovery procedures provided a framework for analyzing different types of projects and established guidelines for collecting charges to cover various selected costs of project development. The criteria employed in this study have been explicitly detailed to allow for adjustments in the choice of benefits, cost estimates, and production assumptions by other analysts. Conceptually, these procedures and criteria have provided a useful tool in understanding the impacts of various public projects.

The third objective was to use the cost-recovery analysis as a device to evaluate the proposed development schemes and to make suggestions for possible alternative development strategies. Serious resource limitations, particularly the quality of the land base, will have to be considered in each scheme as well as the capability of the agricultural infrastructure to support these programs. Several alternatives will be discussed below as possible recommendations to the ALRO program.

In attempting to determine what can be achieved by land reform, it should be remembered that the underlying issues are very complex--ingrained in a traditional cultural, social, political, and economic structure. For

this reason improvement in land tenure arrangements will not solve all the problems Thailand faces. Land reform is one of many tools which will have to be employed to facilitate economic growth and improve the quality of life for the rural population.

Conclusions

An overall theme, improving rural welfare through sound resource development practices, emerges from this study. Two important steps have been identified in Thailand as necessary to improve rural welfare. First, a land reform program needs to be implemented which can distribute ownership rights to farm families who rely on the soil for their livelihood. This is followed by step two, a sound land and water development project, supported by various agricultural services. To insure that as many people as possible can benefit from land reform, project beneficiaries are required to make payments covering all irrigation development costs. Cost-recovery becomes a key feature of the land reform program. In fact, the interrelationship of land reform and cost-recovery is very important. While agrarian reform composed of a wide assortment of development projects designed to improve rural welfare does not require land reform as a pre condition, land reform does need to be followed by development projects to insure the reform's success in the future. Cost-recovery promotes continuity in the land reform by generating capital which can be allocated to new development projects. It is important to keep this relationship between land reform and cost-recovery in mind.

Prior to initiating this research study, a review of the available literature and discussions with ALRO officials formulated an impression

that tenancy was a serious problem throughout much of the country. Based on this initial information, the study's first hypothesis was that the land tenure pattern was skewed with a small number of land-owners and a large number of tenants. Closely associated with this impression was the hypothesis that the environment for land reform was favorable for successful implementation. These two hypotheses were examined in the first parts of this study.

A large portion of the study focused on the second component for improving rural welfare, the agricultural development program. To reach target incomes, agricultural opportunities have to be expanded through a land and water improvement program. To support these new opportunities, services were needed from various elements of the agricultural infrastructure. Two hypotheses were made: first, that the projects designed for the reform areas were economically feasible and that project participants were capable of repaying investment costs made in their behalf and, second, that the agricultural infrastructure is capable of providing the necessary services required to support agricultural activities for the life of the project.

The author's expectations were based on the belief that land reform was a good idea which was supported by agricultural development and the principles of cost-recovery. Since there are several major components to this study and specific conclusions can be drawn about each, this section will briefly examine these components individually. A final recapitulation will follow which will compare the author's initial expectations with the findings.

Tenancy

Implementation of land reform requires solid basic data on the existing ownership patterns in the country. Various reports from government agencies and private research studies have provided some interesting statistics on land tenure. Unfortunately, they are at best fragmentary and prove to be inadequate and inconsistent. The result is that the general description of the tenancy situation is based on inference. For example, many observers of Thailand like to describe the country as composed of small independent farmers who own their own land. However, this generalization has little meaning if the actual land distribution is unknown. Land policy based on limited facts can hardly be expected to influence landowners to pursue a particular course of action.

Other problems concerning the data also exist particularly the differences in definitions of key concepts, interpretation of data, and survey methods. These problems limit the usefulness of available data especially its applicability to the existing agricultural situation.

A major factor contributing to these problems is the ambiguous and complicated titling procedure. The titling process does not clearly reveal who the owner actually is. In some cases, the farm operator may have to share landed interests with others.

Who actually owns land in Thailand? If land ownership is viewed as a set of relationships between individuals with respect to an object, the social and cultural patterns of society may make it difficult to identify landowners. In many cases, the landowners are protected by a set of hierarchical social arrangements. The problems of obtaining

data about landowners are exacerbated by a titling system and social structure which easily masks the identity of the actual owners.

Another factor making it difficult to evaluate the land tenure situation is the absence of a land market which reflects the true market value of land. Defects in the land market include: lack of information, inaccurate description of the land, imperfect specifications of ownership rights, ineffective credit system to support market, unclear method of title transfer, absence of a court system to facilitate transfer, and the divisibility of the product. In most cases, the market price understates the true value of the land. Without an appropriate measure of the land value, analysis of the distribution of wealth and other impacts of a skewed tenure pattern is harder and more costly.

This study shows tenancy to vary widely throughout the country, with the highest tenancy rates found in the Central Plains region. In several of the high tenancy areas, internal improvement programs have encouraged large landholdings. Land speculation is also a problem, especially around Bangkok and in areas designated for on-farm irrigation development.

No official statement has been issued stating what level of tenancy is unacceptable. What tenancy is acceptable depends on the landlord-tenant relationship and the rental arrangements arrived at during their contract bargaining. In some areas, tenants enjoy favorable rental contracts because of close and friendly relationships with their landowners. Throughout the Central Plains landlord-tenant relationships are not considered good. This situation is reflected in the extortionary rental payments tenants are required to make in some areas.

Because of these problems, it is very difficult to measure the severity of the tenancy situation. Present indications suggest that serious tenancy situations do exist and should be corrected; however, nationwide the situation does not appear to be as serious as other agriculturally related problems particularly the destruction of the nation's watersheds.

Land Reform Legislation

Thailand's land reform legislation directs the government to redistribute land among the tenants and landless and to provide better methods of cultivation for poor farmers through improved credit and marketing facilities, cooperatives, and new technology. An accompanying land rent control act establishes rent ceilings and provides for security of tenure.

The problem with rent reductions, as past attempts point out, is that these acts are very difficult to enforce. As population pressure on land resources continues to increase, competition for land will likewise increase allowing the bargaining power to shift in favor of those who already own land. There is no indication that the government will actively enforce the newest rent control acts.

Land reform legislation attempts to accommodate both landlord and tenant. In essence, the government recognizes the fact that all tenancy will not be eliminated. This reform does not involve any drastic redistribution of the property, income, political power, or social status, currently enjoyed by the landlords. Attempts to satisfy all parties involved in the land reform process will limit the effectiveness of the legislation in improving the conditions of those individuals who actually till the soil.

Two of the major weaknesses of land reform legislation are the liberal land ceilings and the ambiguous compensation rules. Landlords are able to retain certain portions of their lands, from 50 rai to 1,000 rai, depending on the agricultural circumstances surrounding their enterprise. Even absentee landlords are allowed to retain a certain amount of their holding. Since evasion of land ceilings is relatively easy, one can assume that Thailand's land reform will not be far-reaching. In fact, current land reform activities have focused on public and Crown lands.

Compensation rules for paying for property taken from landlords have not been clearly defined. Even though the ALRO has a formula for deriving the value of the land, prevailing market prices do not reflect a true value for the land. In most cases, the price agreed upon is arbitrary and usually favors the landlord who is in a more advantageous bargaining position because of his political power and social position.

Effective implementation depends on the administrative and technical skill of the implementing agency and political climate of the country. The ALRO lacks a well-trained staff, knowledgeable of land tenure concepts and experience in agriculture. In time, this problem will be overcome. A more immediate threat to implementation is the instability of the political institution. Five changes of government within two years has slowed down, if not retarded, the land reform effort. Without strong political will and leadership, land reform is nothing more than a well written document.

In effect, the land reform act has been weakened by liberal exemptions and ambiguous procedures. Whether this was done on purpose by those responsible for its content is not known; the weakness of the political

establishment could lead someone to such a conjecture. Without strong political will there is little chance that land reform will be successfully implemented.

Institutional Setting

Often overlooked or purposely ignored is the important role the institutional (cultural, social, and political) setting plays during the implementation process. The behavior of each actor directly influences the direction land reform will take. Of all the actors identified in this report, the most important is the civilian bureaucracy. Within the bureaucracy the ALRO does not have high social status even though its functional role is recognized by other agencies. Because its functional role impinges on existing programs and its social position is not secure enough to exert any pressure on key decision-makers within the bureaucracy, the ALRO faces some serious resistance to implementing their land reform program

Most ALRO officials seem to refuse to recognize that other agencies are attempting to block the ALRO from undertaking various aspects of their projects. These obstructions can be very subtle, e.g., slowly responding to requests for assistance, or assigning poorly qualified staff members to ALRO projects, or they can be flagrant, e.g., outright refusal to cooperate. Most agencies will not go to the extreme because of the behavioral characteristics displayed within the bureaucracy. Regardless, as long as the ALRO pursues activities which duplicate other departments, animosities will continue to grow.

Because of the impact the institutional setting has on the implementation process, it must be recognized as an important variable by ALRO officials and policy analysts. In fact, foreign observers, whether students

of land reform or politicians from countries contemplating land reform, can find by observing the Thailand situation just how influential the country's institutions are. Even if a reform is economically feasible, they may be unacceptable to other social, cultural, and political institutions of society.

Ironically, the bureaucracy will also insure the continued existence of the ALRO, even if it does obstruct ALRO programs. One of the main functions of the bureaucracy is to employ college graduates. Currently the civilian bureaucracy does not have enough jobs for the number of available graduates. By creating a new agency such as the ALRO, numerous new jobs are made available in Bangkok and the provinces. The ALRO staff has grown rapidly and will continue to grow as more areas come under reform. As long as the ALRO continues to provide jobs for college graduates, their programs will not be eliminated by the government.

Development Projects

From the available information, it appears that the projects designed for the Nong Sua and Ban Na land reform areas are economically feasible and that project beneficiaries can repay 65 percent of the irrigation investment costs. Two factors, the condition of the resource base and the capability of the agricultural infrastructure to provide services, cast some doubt over the validity of these figures. Project estimates are very optimistic in light of the limitations of the soil and water resources. Early reports from land improvement programs indicate the soils are responding to lime treatments, but for how long and to what degree? Only in Ban Na have project officials recognized the

area's resource limitations. In other areas, project implementation proceeds without a thorough examination of the resource base. This leads to faulty expectations and promises.

The weakest link in the entire ALRO program is the agricultural infrastructure. At the present time, the various agricultural institutions, especially credit marketing (inputs and outputs) and extension, do not possess the capabilities to provide the necessary services to sustain the land reform movement. Cooperatives have helped improve the situation, but they are still in their infancy and can only perform certain functions. Unless the ALRO is willing to put a lot of money and man hours which they do not have into building the agricultural infrastructure, expectations must be adjusted accordingly.

Cost-Recovery Analysis

The cost-recovery analysis was designed to provide guidelines and information on issues related to the capability of project beneficiaries to reimburse the government for investments made in their behalf. Only a limited group of farmers will be sharing in the benefits of the land reform projects. Those who receive water, a scarce resource needed for year round cultivation, should be obligated to pay for its on-farm delivery. It would be socially unjust to allow one group of farmers to benefit at the expense of the rest of the nation. Since all factors in the production process will be fairly remunerated, the government is justified in leveling charges on farmers for on-farm development.

Historical precedent does not support this type of approach. Farmers in other irrigation development projects have not been required to pay for investment costs. Even in the highly controlled Hupkapong project, participants were not assessed water usage fees. Too often

government projects are viewed simply as gifts so the people do not feel obligated to pay for the costs incurred in their behalf. At the same time, government officials are reluctant to use coercive measures to collect charges because action of this nature runs counter to the prevailing social and cultural attitudes between the government and the rural people.

When a procedure for recovering investment costs is established, charges should be specifically related to operation and maintenance costs, land leveling, and on-farm irrigation construction costs.

Returns from the proposed projects appear to be high enough that farmers can meet repayment requirements under a number of assumed conditions. There are several alternative approaches that can be taken to collect charges, each requiring a different amount to be paid. A fixed predetermined fee schedule or fees, capturing the full amount of the repayment capacity are the two best alternatives. A predetermined fee schedule is preferred because it does not require the continual measurement of yields, production costs, and rice prices. If payments are made semiannually, farmers should be able to meet the payment schedules.

Adjustments have been made to account for adverse cropping seasons, price declines, and lower cropping intensities than expected. Nong Sua farmers should be able to adjust to most situations and still reimburse the government. Ban Na farmers will have problems adjusting to adverse conditions unless they receive assistance from the government.

Cost estimates have not been adjusted and may be too conservative. If costs are higher than presented in this report, Ban Na farmers could possibly be unable to meet the desired payment schedule and attain target incomes.

This analysis indicates that under most conditions farmers will not only be able to repay investment costs but should be able to purchase the land they are allocated and retain enough earnings to achieve minimum target incomes.

A major benefit of the land reform program will be greater rural stability. Increased emphasis has been placed on improving the political situation in rural areas, since the political disturbances in October, 1976. At least 25 percent of the development costs can be subsidized by the government to account for the intangible benefits accruing from rural stability. The government should be prepared to subsidize more of the costs if the land reform program effectively allays political unrest in rural areas.

Recapitulation

In briefly summarizing this study's findings with respect to its initial expectations, three areas of concern should be highlighted. First, this study questions the severity of the tenancy situation. The study does recognize that pockets of high tenancy exist in the country and should be corrected. A more insightful and appropriate conclusion would place Thailand at a crossroads--the pressures on the land are at a point the country could follow a path toward highly distorted land ownership patterns or follow a path toward a more responsible land management program. Currently, development and settlement patterns proceed with a total disregard for natural resource conditions. This attitude has led to the destruction of the nation's forest causing, in turn, flooding and extensive soil erosion. Without purposely forgetting the importance of an equitable land tenure system, the Thai government

should focus its attention and energy on developing a ecologically sound resource management program. Resource management goes hand in hand with land ownership. Proper stewardship insures the productivity of the land making it valuable to own.

Second, the environment for land reform is not as favorable as ALRO officials contend. Plagued by numerous changes in government during its first two years, the ALRO has had to rejustify its existence on several occasions. Bureaucratic resistance is another obstacle to successful implementation. This resistance is very subtle and not public knowledge, but it is very potent especially in areas where ALRO functions overlap or duplicate with another agency. Another form of bureaucratic resistance is the ability of several departments to retain functions which are keys to the ALRO program. One such example finds the Land Department with the power to issue title deeds--certainly a key function of the land reform program. Depending on the attitude of Land Department officials, the final stages of land reform, when full title is transfered to the former tenant, can be delayed. Bureaucratic obstacles cast doubt on the ability of the ALRO to successfully carry out land reform on a broad scale.

Third, the projects as currently designed appear to be economically feasible and beneficiaries can make payments to cover development costs. Though economically rational, the cost-recovery guidelines and policy are socially and culturally unacceptable. In fact, there is no historical precedent for this type of action. Rural people have traditionally viewed investments made by the government as gifts. This attitude follows from the behavioral relationships between the people and the state. Unless the government is willing to use some type of coercive procedure,

collecting these charges will be very difficult. ALRO should not rely on cost-recovery to generate capital flows for new projects.

From all the findings, both fact and inference, it appears that the land reform program will proceed slowly. Most of the lands affected by reform will be Crown lands and public domain. Private holdings will not be expropriated; only private owners selling at a favorable price will opt to deed their lands to the ALRO. The ALRO also should not expect their development projects to produce instant success. Because of the limitations mentioned above, many reform projects will need hours of supervision if they are to succeed. Initial setbacks should be expected and included in ALRO projections.

Recommendations

The decision to enact land reform legislation is a political one. The solutions to the issues raised during the implementation of the land reform program will also have to be found within the political process. In light of the political situation at this time, it would be inappropriate to make recommendations with obvious political overtones. The following recommendations pertain to the functional aspects of the land reform program.

Data Improvements

Better land ownership data is needed to improve the conceptual and empirical understanding of the land tenure situation. Two steps need to be taken. First, all relevant property units should be observed to identify owners, to list the land's basic characteristics, and to determine the value of the property. The second step involves the sampling of the general population to gather information on tenancy, rental

arrangements, sources of income, etc. which can be used to develop land policy. Though this latter step has been carried out in the past, no acceptable benchmark has been established because of inconsistencies in survey methods.

Both steps require different methods. The first step is a continual monitoring effort in order to record all land transaction. At this time, the ALRO does not perform this function regularly or comprehensively. More attention should be given to gathering this type of information. In the second step, a survey method should be established which will reproduce reliable land tenure information on successive samplings.

One area where information is needed concerns tenure mobility. The evidence is not clear on whether a young farmer can eventually become a full owner. Mobility up the agricultural ladder is a clue to any possible tenancy problems. Such information would be helpful to decision-makers in planning alternative strategies.

Besides improving its data gathering techniques, the ALRO should be more aware of its information needs: what data are really necessary to make land reform decisions? Because Thailand is at a crossroads concerning its land resources, time wasted in collecting the wrong data could affect future policy decisions. Exactly what data are collected depends on the intentions of the ALRO. Based on these intentions, ALRO officials should articulate carefully their research needs.

Alternative Project Recommendations

Any agricultural project designed for and implemented in the Ban Na land reform area will be costly and benefits will accrue slowly because of resource limitations. If the vegetable farming project is carried

out, a complementary livestock project, e.g., ducks, should be initiated. Organic fertilizer will be needed for the vegetable beds and duck manure is the best source. The potential of Ban Na soils are so questionable that other alternatives must be seriously considered. One alternative would be a water buffalo project where the land supports natural grasses to graze buffalo. Cattle manure could be spread over the soil to improve its quality.

If the soil continues to deteriorate rapidly, another alternative would be to shift the area out of agricultural production completely turning the area into an industrial park. A number of small industries can employ the people of the area at wages which will keep them from migrating to Bangkok. In both cases the government should be prepared to provide direct subsidies to the farm families for subsistence until the projects are underway.

In Nong Sua, heavy reliance has been placed on rice cultivation. Officials feel that three crops of rice can be grown yearly. Because the rice price is susceptible to fluctuations in the world market and continuous mono-planting jeopardizes soil quality, a crop diversification program is recommended for Nong Sua. The area already produces a large number of crops, e.g., oranges, melons, flowers, and vegetables. Crops requiring less water would make excellent choices. Serious consideration should be given to alternative cropping patterns.

The policy decision has been made to begin projects without first acquiring private lands. This decision should be critically reviewed. A common experience in other countries reveals that once Crown and public lands have been reformed enthusiasm for the program disappears and no private lands are reformed. If irrigation projects are initiated

before all lands are acquired by the ALRO and something should happen to curtail the land reform program, the only persons who would benefit are the landlords.

Agricultural Infrastructure

Farmers have long viewed credit as a gift. The farmers must begin to distinguish between credit as credit and credit as a gift. This is a learning process which calls for a managed credit program. Possibly the private banks can participate in setting up such a program.

One way to avoid the gift concept is to involve the private sector in the design and implementation of development projects on a pilot project basis. Since they will be investing their own money, the private sector will expect returns and results which will come through a soundly managed program. There are some members in the private sector who have indicated a willingness to participate in the land reform program. The ALRO should seriously consider using private sector management on a pilot project basis.

Cooperatives will be the key to the successful operation of the land reform projects. Past performance of cooperatives indicate that they seldom provide what is expected. Most cooperatives only serve as a vehicle to supply credit to farmers. An effective cooperative can provide additional services such as providing inputs and technical information, plowing service, and marketing functions. The cooperatives set up by the ALRO should provide all the services required by the farmers. This will take considerable planning and involvement by the ALRO staff.

The key to successful cooperatives and to a successful land reform program is leadership. Many times a well planned program fails because

those in charge of the project are not capable leaders. It is recommended that incentives be high enough to attract and retain well qualified individuals to manage the land reform cooperatives.

Cost-Recovery

Cost-recovery is only one of several ALRO objectives. The ALRO should establish a set of priorities for these objectives. Objectives addressed to attaining target incomes, recovering investment costs and purchasing land may at times conflict. It is important to know which objective should be given top priority in case of controversies. Setting priorities will also facilitate the establishment of rates to be charged per year for land purchase and recoupment of investment costs.

By setting forth its object on target incomes, the ALRO has made in effect certain promises to project participants. If these promises cannot be realized, the government should rescind the obligations of the participants reciprocally. Quite often expectations cannot be met; it is wiser to reduce the obligations of those involved than to lose their total participation in the project.

If the political situation should stabilize and a government divorced from the bureaucracy established, two additional recommendations are offered. Should land reform remain a top priority, it is suggested that all land functions and agencies performing these functions be assembled in one ministry. Instead of having an ALRO, a land reform commission should supervise all these agencies coordinating their activities. If handled tactfully, the agencies will not lose social or functional power and land reform will be implemented.

Legally, two changes should be made in existing land related legislation. First, less complicated and a more understandable land titling

procedure should be enacted to facilitate the transfer of public domain to private ownership. Next, the Land Reform Act should be amended to eliminate the liberal exemptions to land ownership. Successive land reforms will have to be carried out since the rural distribution of wealth was not affected by the current reform program. Another amendment should carefully detail the necessary steps in the expropriation and compensation process.

Even though this study focuses on the importance of land reform in improving the agricultural situation in Thailand, the most serious problem appears to be the continual deforestation and degradation of the upland watersheds. The ALRO is in an excellent position to emphasize the need for a sound resource management program. From their position as agents for developing land policy, it seems warranted that the ALRO take the leadership role in designing and implementing this type of program. Without a land and water management program, the future of all land related activities are in jeopardy including the ALRO's development projects.

APPENDIX A

LAND TENURE DATA

A-1

LAND CERTIFICATES HELD BY OWNER-OPERATORS IN ELEVEN
CENTRAL PROVINCES, 1965

Province	Title Deed %	Exploitation Testimonial %	Reserve License %
Bangkok	100	---	---
Thonburi	100	---	---
Smut Prakarn	100	---	---
Chachoengsao	100	---	---
Nakorn Pathom	98	---	2
Petchburi	94	5	1
Karnchanaburi	0	24	76
Saraburi	89	6	5
Chainat	12	27	61
Sing Buri	81	13	6
Supan Buri	64	22	14
Average	76	9	15

Source: Department of Land Development, Relation of Land Tenure and Production in Eleven Provinces in the Central Plains, 1965 (Bangkok: Ministry of National Development, 1969).

LAND CERTIFICATES HELD BY LANDLORDS IN TWENTY-TWO PROVINCES, 1974-1977

Province	Title Deed			Exploitation			Reserve			Other				
	No.	Area		No.	Testimonial		No.	Licence		No.	Certificates			
		%	(rai)		%	(rai)		%	(rai)		%	(rai)		
Nakorn Nayok	3424	69	232365	76	1163	23	52341	17	8434	3	184	4	14296	5
Chainat	694	29	22887	28	1449	62	50327	62	4591	6	41	1	3208	4
Phetchabun	74	3	5221	3	1309	46	64629	40	4885	3	1300	45	86191	54
Chon Buri	3857	83	153459	67	429	9	34052	15	18093	8	245	5	23009	10
Supan Buri	5979	63	205151	62	2983	31	100688	30	4491	1	304	4	19008	7
Chachoengsoa	9667	95	485644	95	408	4	19152	4	989	.2	97	1	4431	.8
Ang Thong	3508	90	74711	90	309	8	7302	9	155	.2	54	1.5	982	.8
Nakorn Sawan	1444	24	61824	22	2875	48	125175	44	39381	16	1053	18	56000	24
Phitsanulok	700	30	20606	24	1015	43	43336	51	7672	9	336	15	13105	16
Sing Buri	1803	86	47814	89	230	11	4156	8	155	.3	54	25	1809	27
Lop Buri	3488	57	136176	52	626	10	21988	8	3382	1	1825	31	99044	39
Kanchanaburi	186	12	5865	11	1001	66	30671	58	--	--	425	22	16039	31
Samut Prakan	2555	99	130031	99	40	1	758	1	--	--	2	0	44	0
Samut Sakhon	2702	98	76895	99	48	1.5	806	1	--	--	19	.5	342	.5
Samut Songkhram	2443	99	35344	97	24	1	881	2	--	--	5	0	164	1
Nakorn Pathom	7396	95	260247	95	463	6	10735	4	--	--	169	2	3207	1
Nontha Buri	3083	100	91436	100	4	0	42	0	--	--	--	--	--	--
Pathum Thani	4825	100	388025	100	18	0	914	0	--	--	7	0	11	0
Ayutthaya	19773	98	543687	100	119	0	1060	0	--	--	57	0	373	.1
Prachin Buri	1304	42	102875	41	2459	54	125000	51	--	--	390	8	20276	7
Tak	294	24	3727	17	425	34	9670	43	--	--	552	44	9007	40
Lampang	544	20	9140	30	1849	67	18384	61	--	--	408	14	2789	9

Source: Department of Land Development, Agricultural Land Tenure Surveys, (Bangkok: Ministry of National Development, 1974-1977).

A-3

LANDOWNER AND TENANT CULTIVATORS BY REGION, 1963

Region	Owner Cultivator			Tenant Cultivator			Total	
	No.	%	Area (rai)	No.	%	Area (rai)	No.	Area (rai)
Central Plains	540,000	75	15,426,000	183,000	23	3,955,000	723,000	19,381,000
South	414,000	84	9,787,000	79,000	16	1,538,000	493,000	11,325,000
Northeast	1,103,000	90	24,006,000	118,000	10	2,413,000	7,221,000	26,419,000
North	576,000	74	10,065,000	202,000	26	2,473,000	778,000	12,557,000
Total	2,633,000	82	59,284,000	582,000	18	10,379,000	3,215,000	69,682,000

Source: Royal Thai Government, Census of Agriculture, 1963.

A-4

PERCENTAGE OF TENANT FARMERS BY REGION, 1969

Region	% of Tenant Farmers
Central Plains	41
South	14
Northeast	3
North	18
Total	

Source: Royal Thai Government, National Statistics
Office

A-5

TENURIAL SITUATION BY REGIONS, 1968

Region	Selected Provinces	Total No. of Rice Farming Families	Tenure in Percent		
			Owners	Part-Owners	Tenants
North		723,755	82	4	14
	Phichit	42,501	62	10	27
	Chiang Mai	94,477	66	7	27
	Uthai Thani	14,322	67	9	24
Central		498,232	59	16	25
	Pathum Thani	17,097	17	12	71
	Phra Nakhon	12,853	18	19	63
	Thonburi	4,568	27	12	61
Northeast		1,183,989	97	.6	2
	Korat	121,042	93	1.3	5
	Surin	69,944	95	1.4	3
	Chaiyaphum	67,281	97	.4	3
South		360,974	84	8	7
	Pukhet	2,496	70	.4	30
	Ranong	2,086	81	4	15
	Phangnga	6,243	77	8	14
Thailand		2,766,950	85	5	10

Source: Adul Niyomwipat, Under-Secretary of State, (unpublished research paper, Ministry of Agriculture and Cooperatives, 1972).

A-6

LAND TENURE OF RICE FARMERS IN TWENTY-SIX
CENTRAL PLAINS PROVINCES, 1967

Province	No.	Farm Households			Agricultural Area		
		% Owner	% Part-Owner	% Tenant	Amount rai	% Owned	% Rented
Prachin Buri	23,785	73	12	15	956,491	79	21
Ang Thong	19,424	53	28	19	409,973	67	33
Uthai Thani	12,973	73	9	18	424,810	78	22
Phichit	21,236	82	4	14	798,934	84	16
Phitsanulok	31,078	91	3	6	750,688	94	6
Phetchabun	21,125	94	1	5	396,581	95	5
Saraburi	19,495	46	23	31	620,801	57	43
Lop Buri	20,403	55	16	29	586,306	57	43
Supan Buri	42,168	60	22	18	1,238,538	72	28
Petchaburi	15,472	58	29	13	324,064	67	33
Kanchanaburi	11,116	85	9	6	253,055	90	10
Nakhon Pathom	26,135	47	22	31	717,681	58	42
Ayuthaya	36,302	27	37	36	1,217,277	45	55
Nakhon Nayok	11,072	21	25	54	629,607	38	62
Chachoengsao	21,953	34	20	46	903,384	44	56
Sukhothai	24,838	96	1	3	546,621	97	3
Kamphaeng Phet	13,284	90	3	7	470,364	92	8
Ratchaburi	20,952	61	24	15	449,985	70	30
Nontha Buri	6,790	58	14	28	211,893	65	35
Samut Prakan	7,679	24	16	60	272,079	36	74
Pathum Thani	15,738	23	16	61	745,358	32	76
Sing Buri	14,280	56	24	20	355,679	68	32
Chainat	25,500	65	17	18	679,908	75	25
Nakorn Sawan	50,428	78	5	17	1,577,565	81	19
Phra Nakhon	97,378	23	18	59	266,126	36	64
Thonburi	3,379	37	10	53	85,383	45	55
Total	524,253	62	16	22	15,889,151	67	33

Source: Land Policy Division, Land Development Department, Land Tenure Situation in Twenty-Six Changwats of Central Plains Region, 1967-68, Table 1 and 2.

A-7

LAND TENURE ALL AGRICULTURAL UNITS IN TWENTY-TWO PROVINCES, 1974-1977

Province	No.	Farm Households					Agricultural Area				
		% Owner	% Part-Owner	% Tenant	% Landless	Amount (rai)	% Owner-Operated	% Rented			
Nakhon Nayok	16,242	33	12	31	24	727,682	61	39			
Chainat	31,353	79	5	8	8	814,420	89	11			
Phetchabun	70,273	85	2	6	7	1,597,382	93	7			
Chon Buri	42,436	83	4	8	5	1,220,313	87	13			
Supan Buri	65,757	72	8	11	9	1,867,829	84	16			
Chachoengsao	38,016	50	8	27	15	1,297,959	61	39			
Ang Thong	21,061	47	15	14	24	448,738	78	22			
Nakhon Sawan	59,679	78	4	10	8	1,959,173	89	11			
Phitsanulok	44,588	84	3	5	8	1,122,638	93	7			
Sing Buri	16,515	58	10	13	19	368,889	79	21			
Lop Buri	56,867	57	10	15	18	2,001,587	82	18			
Kanchanaburi	22,240	91	2	3	4	1,642,840	98	2			
Samut Prakan	7,361	19	4	46	31	194,757	38	62			
Samut Sakhon	13,428	58	5	16	21	312,419	80	20			
Samut Songkram	12,984	58	3	15	24	192,494	85	15			
Nakhon Phatom	41,680	61	7	18	14	1,008,870	75	25			
Nontha Buri	17,385	61	5	17	17	296,223	67	33			
Phatum Thani	12,971	8	6	60	27	655,512	42	58			
Ayutthaya	51,191	19	18	25	38	1,199,276	51	49			
Prachin Buri	55,132	76	5	7	12	1,975,554	88	12			
Tak	26,723	84	2	5	9	452,682	95	5			
Lampang	96,100	90	2	2	7	945,165	97	3			

Source: Division of Land Policy and Planning, Department of Land Development, Agricultural Land Tenure, 1974-1977.

APPENDIX B
PRODUCTION UNIT MODEL

APPENDIX B

PRODUCTION UNIT MODEL

Comprehensive land reform schemes where the emphasis is placed on on-farm irrigation require detailed planning. To assist project planners the ALRO has developed a model land development, called the production unit model. The design for the production unit was modeled after the Hupkapong Agricultural Cooperative which was sponsored by the king. The Hupkapong project has been considered a success by most observers though much of the credit must be given to the excellent technical assistance and management skills of the Israeli advisors to the project.

The ideal production unit is made up of cooperative farms which will cultivate 10,000 rai of the 12,000 rai within the unit. The remaining 2,000 rai will be used for family housing, a health center, schools, a commons for grazing, fish ponds, roads, canals, and future community expansion. Each unit will support 400 families, each responsible for 25 rai of irrigated farm land. Each family will have one rai for a home site and garden plot.

Spatial arrangements call for the community to be clustered in the center with the agricultural land surrounding the community. This arrangement has been supported by the military who believe it will be easier to defend clustered communities from possible guerilla attack. Some modifications will have to be adopted in areas where linear

community arrangements are prevalent. The Ban Na project provides an example of the basic production unit though it has been modified for vegetable farming (see Map 7, p. 266).

One controversial aspect of the production unit model are the preliminary target income figures. Based on ILACO studies in land consolidation areas and the success of pilot farmers, the ALRO figures that net income will be approximately 40,000 Baht. This figure is based on the assumption that a farmer double cropping rice will harvest a minimum 500 kg/rai per crop and will receive a farm gate price of 2.3 - 2.5 Baht/kg. Gross income would be approximately 60,000 Baht. Assuming production costs of 800 Baht/rai for each cropping season, adjusted net income would be 40,000 Baht.

Though these figures are not unrealistic only a small percentage of Thailand's agricultural area can support income levels of this magnitude. Many land reform areas face serious resource constraints which suggest that these income projections are too high. In light of the difficulty in finding an appropriate development scheme for Ban Na, income projections have been revised to an annual income range of 15,000 to 40,000 Baht.

APPENDIX C

WITH AND WITHOUT PROJECTIONS FOR BAN NA

APPENDIX C-1

WITH AND WITHOUT PROJECT PROJECTIONS FOR LAND IMPROVEMENT, BAN NA

Item	Units	Without Case Broadcast			With Case Land Improvement Project Broadcast, Baht/rai						
		1	2	3	4	5	6	7	8	9	10
<u>Capital</u>											
Yield	kg	309	312	315	318	345	348	351	354	358	386
Price of Paddy	฿	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Gross Value	฿	460	686	693	700	759	766	773	780	787	849
Loan Funds	฿	150	300	300	300	300	300	300	300	300	300
Total Capital	฿	610	986	993	1000	1059	1066	1073	1080	1087	1149
<u>Expenses</u>											
Soil Prep.	฿	21	50	50	50	50	50	50	50	50	50
Planting	฿	10	---	---	---	---	---	---	---	---	---
Harvesting	฿	26	50	50	50	50	50	50	50	50	50
Fertilizer	฿	33	50	50	50	75	75	75	75	75	100
Insecticide and											
Herbicides	฿	---	20*	20	20	20	30	30	30	30	30
Lime	฿	---	70	---	---	---	70	---	---	---	---
Loans											
Interest	฿	18	36	36	36	36	36	36	36	36	36
Repayment	฿	150	300	300	300	300	300	300	300	300	300
Total Expenses	฿	258	456	456	456	531	611	541	541	541	566
Net Income	฿	352	454	530	537	528	455	532	539	546	583

APPENDIX C-1 - Continued.

Item	Units	Without Case		With Case Land Improvement Project										
		Broadcast		Broadcast, Baht/rai										
			11	12	13	14	15	16	17	18	19	20		
<u>Capital</u>														
Yield	kg	209	390	394	398	402	406	410	414	418	422	426		
Price of Paddy	฿	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2		
Gross Value	฿	460	858	867	876	885	894	903	912	921	930	939		
Loan Funds	฿	150	300	300	300	300	300	300	300	300	300	300		
Total Capital	฿	610	1158	1167	1176	1185	1194	1203	1212	1221	1230	1239		
<u>Expenses</u>														
Soil Prep.	฿	21	50	50	50	50	50	50	50	50	50	50		
Planting	฿	10	---	---	---	---	---	---	---	---	---	---		
Harvesting	฿	26	50	50	50	50	50	50	50	50	50	50		
Fertilizer	฿	33	100	100	100	100	100	100	100	100	100	100		
Insecticide and														
Herbicides	฿	---	40*	40	40	40	40	50	50	50	50	50		
Lime	฿	---	70	---	---	---	---	70	---	---	---	---		
Loans														
Interest	฿	18	36	36	36	36	36	36	36	36	36	36		
Repayment	฿	150	300	300	300	300	300	300	300	300	300	300		
Total Expenses	฿	258	646	576	576	576	576	656	586	586	586	586		
Net Income	฿	352	512	591	600	609	618	547	626	635	644	653		

*With project expenses for insecticides and herbicides have been combined.

Source: From computations based on listed assumptions.

APPENDIX C-2

WITH PROJECT PROJECTIONS FOR VEGETABLE FARMING, BAN NA

Item Year	With Case: Vegetable Farming Baht/rai																			
	1*	2	3	4	5	6	7	8**	9	10	11	12	13	14	15	16	17	18	19	20
Capital																				
Gross Estimated Production Value	2842	2842	2842	4842	4942	4942	4942	6942	6942	7052	7052	7052	7052	7052	9052	9052	9052	9052	9052	9052
Loans	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
Total Capital	3142	3142	3142	5142	5242	5242	5242	7242	7242	7352	7352	7352	7352	7352	9352	9352	9352	9352	9352	9352
Expenses																				
Seeds	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Fertilizer	53	53	53	53	75	75	75	75	75	100	100	100	100	100	100	100	100	100	100	100
Insecticides & Herbicides	62	62	62	62	90	90	90	90	90	120	120	120	120	120	120	120	120	120	120	120
Hired Labor	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Depreciation & Other	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Soil Preparation & Maintenance	53	52	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53
Sub Total:																				
1 Planting	240	240	240	240	290	290	290	290	290	345	345	345	345	345	345	345	345	345	345	345
2 Plantings	480	480	480	480	580	580	580	580	580	690	690	690	690	690	690	690	690	690	690	690
Lime	70	---	---	---	---	70	---	---	---	---	70	---	---	---	---	70	---	---	---	---
Loans																				
Interest	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
Payment	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
Total Expenses	1212	1142	1142	1142	1242	1312	1242	1242	1242	1352	1422	1352	1352	1352	1352	1422	1352	1352	1352	1352
Gross Estimated Net Income	1930	2000	2000	4000	4000	3930	4000	6000	6000	6000	5930	6000	6000	6000	8000	7930	8000	8000	8000	8000

*Two crop combination. **Three crop combination.

Source: From computations based on listed assumptions.

APPENDIX D

WITH AND WITHOUT PROJECTIONS FOR NONG SUA

APPENDIX D
WITH AND WITHOUT PROJECT PROJECTIONS OF FARMER INCOME, NONG SUA

Year	Without Case			With Case											
	Units	Broadcast	Transplant	Transplant Both Seasons, Baht/rai											
	Aa	Bb		1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	7A
Capital															
Cropping															
Intensity	z	100	16	100	30	100	30	100	30	100	30	100	50	100	50
Yield	kg	215	362	400	520	408	530	416	540	424	550	432	560	628	510
Price of Paddy	฿	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Gross Value	฿	473	796	880	1144	898	1166	915	1188	933	1210	950	1232	1100	1382
Loan Funds	฿	100	100	300	300	300	300	300	300	300	300	200	200	200	200
Total Capital	฿	573	896	1180	1444	1198	1466	1215	1488	1233	1510	1150	1432	1300	1582
Expenses															
Nursery	฿	---	---	20	20	20	20	20	20	20	20	20	20	20	20
Soil Prep.	฿	20	39	100	100	100	100	100	100	100	100	100	100	100	100
Planting	฿	20	58	35	35	35	35	35	35	35	35	35	35	35	35
Weeding	฿	---	---	10	10	10	10	10	10	10	10	10	10	10	10
Harvesting	฿	40	73	55	55	55	55	55	55	55	55	55	55	55	55
Seeds	฿	6	6	25	25	25	25	25	25	25	25	25	25	25	25
Fertilizer	฿	55	143	100	150	100	150	100	150	100	150	100	150	125	175
Insecticide &	฿	---	9	25 ^c	25	25	25	25	25	25	25	35	35	35	35
Herbicides	฿	---	5	70	---	---	---	---	---	---	---	---	---	70	---
Lime	฿	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Loans															
Interest	฿	12	12	36	36	36	36	36	36	36	36	24	24	24	24
Repayment	฿	100	100	300	300	300	300	300	300	300	300	200	200	200	200
Total Expenses	฿	253	445	776	756	706	756	706	756	706	756	604	454	699	629
Net Income	฿	320	451	404	688	492	710	509	732	527	754	546	778	601	903

APPENDIX D - Continued

Year	Units	Without Case		With Case													
		Broadcast A ^a	Transplant B ^b	8A	8B	9A	9B	10A	10B	11A	11B	12A	12B	13A	13B	14A	14B
Capital																	
Cropping																	
Intensity	z	100	16	100	50	100	50	100	75	100	75	100	75	100	75	100	75
Yield	kg	215	362	520	644	530	652	541	660	608	726	617	732	626	738	635	744
Price of Paddy	฿	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Gross Value	฿	473	796	1144	1417	1166	1434	1190	1452	1338	1597	1357	1610	1377	1624	1397	1637
Loan Funds	฿	100	100	200	200	200	200	150	100	150	100	150	100	150	100	150	100
Total Capital	฿	573	896	1344	1617	1366	1634	1340	1552	1488	1697	1507	1710	1527	1724	1547	1737
Expenses																	
Nursery	฿	---	---	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Soil Prep.	฿	20	39	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Planting	฿	20	58	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Weeding	฿	---	---	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Harvesting	฿	40	73	55	55	55	55	55	55	55	55	55	55	55	55	55	55
Seeds	฿	5	6	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Fertilizer	฿	55	143	125	175	125	175	125	175	150	200	150	200	150	200	150	200
Insecticide &	฿	---	9	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Herbicides	฿	---	5	35c	35	35	35	45	45	45	45	45	45	45	45	45	45
Lime	฿	---	---	---	---	---	---	---	---	70	---	---	---	---	---	---	---
Loans																	
Interest	฿	12	12	24	24	24	24	18	12	18	12	18	12	18	12	18	12
Repayment	฿	100	100	200	200	200	200	150	100	150	100	150	100	150	100	150	100
Total Expenses	฿	253	445	629	697	629	679	583	587	688	612	618	612	618	612	618	612
Net Income	฿	320	451	715	938	737	955	757	965	800	1085	889	1098	909	1112	929	1125

APPENDIX D - Continued

Year	Units	Without Case				With Case													
		Broadcast		Transplant		Transplant Both Seasons, Baht/rai													
		A ^a	B ^b	A ^a	B ^b	15A	15B	16A	16B	17A	17B	18A	18B	19A	19B	20A	20B		
Capital																			
Cropping																			
Intensity	z	100	16			100	75	100	85	100	85	100	85	100	85	100	85		
Yield	kg	215	362			644	750	712	757	719	765	726	772	735	780	745	800		
Price of Paddy	฿	2.2	2.2			2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2		
Gross Value	฿	473	796			1417	1650	1566	1665	1582	1683	1597	1698	1617	1716	1639	1760		
Loan Funds	฿	100	100			150	100	100	---	100	---	100	---	100	---	100	---		
Total Capital	฿	573	896			1567	1750	1666	1665	1682	1683	1697	1698	1717	1716	1739	1760		
Expenses																			
Nursery	฿	---	---			20	20	20	20	20	20	20	20	20	20	20	20		
Soil Prep.	฿	20	39			100	100	100	100	100	100	100	100	100	100	100	100		
Planting	฿	20	58			35	35	35	35	35	35	35	35	35	35	35	35		
Weeding	฿	---	---			10	10	10	10	10	10	10	10	10	10	10	10		
Harvesting	฿	40	73			55	55	55	55	55	55	55	55	55	55	55	55		
Seeds	฿	5	6			25	25	25	25	25	25	25	25	25	25	25	25		
Fertilizer	฿	55	143			150	200	175	200	175	200	175	200	175	200	175	200		
Insecticide &	฿	---	9			---	---	---	---	---	---	---	---	---	---	---	---		
Herbicides	฿	---	5			55 ^c	55	55	55	55	55	55	55	55	55	55	55		
Lime	฿	---	---			---	---	70	---	---	---	---	---	---	---	---	---		
Loans																			
Interest	฿	12	12			18	12	12	---	12	---	12	---	12	---	12	---		
Repayment	฿	100	100			150	100	100	---	100	---	100	---	100	---	100	---		
Total Expenses	฿	253	445			628	622	667	510	597	510	597	510	597	510	597	510		
Net Income	฿	320	451			939	1128	999	1155	1085	1173	1100	1188	1120	1206	1142	1250		

^aA = Wet Season ^bB = Dry Season^cWith project expenses for insecticides and herbicides have been combined.

Source: From computations based on listed assumptions.

APPENDIX E
INCOME ALLOCATIONS TO PRODUCTION FACTORS

APPENDIX E-1

INCOME ALLOCATION TO PRODUCTION FACTORS FOR VEGETABLE
FARMING IN BAN NA LAND REFORM AREA

Years	Gross Income	Net Income Per Rai	Factor Allocation per rai				
			Capital	Labor	Management	Land	Water
0	460	352	10	132	46	164	0
1*	2842	1930	34	896	284	358	358
2	2842	2000	34	896	284	393	393
3	2842	2000	34	896	284	393	393
4	4842	4000	34	896	484	1293	1293
5	4942	4000	34	896	494	1288	1288
6*	4942	3930	34	896	494	1253	1253
7	4942	4000	34	896	694	1288	1288
8	6942	6000	34	896	694	2188	2188
9	6942	6000	34	896	705	2181	2181
10	7052	6000	34	896	705	2181	2181
11*	7052	5930	34	896	705	2147	2147
12	7052	6000	34	896	705	2181	2181
13	7052	6000	34	896	705	2181	2181
14	7052	6000	34	896	705	2181	2181
15	9052	8000	34	896	905	3082	3082
16*	9052	7930	34	896	905	3047	3047
17	9052	8000	34	896	905	3081	3081
18	9052	8000	34	896	905	3081	3081
19	9052	8000	34	896	905	3081	3081
20	9052	8000	34	896	905	3081	3081
21*	9052	7930	34	896	905	3047	3047
22	9052	8000	34	896	905	3081	3081
23	9052	8000	34	896	905	3081	3081
24	9052	8000	34	896	905	3081	3081
25	9052	8000	34	896	905	3081	3081

Year '0' Broadcast Rice

Year '1' Vegetable Farming

*Year for lime application

Source: From computations based on listed assumptions and Table VI-29.

APPENDIX E-2A

INCOME ALLOCATION TO PRODUCTION FACTORS FOR
RICE GROWING IN NONG SUA, WET SEASON,
CROPPING INTENSITY 100 PERCENT

Years	Gross Income	Net Income Per Rai	Factor Allocation per rai				
			Capital	Labor	Management	Land	Water
0	473	320	13	132	47	128	0
1*	880	404	22	320	88	---	---
2	898	492	22	320	90	60	---
3	915	509	22	320	92	65	---
4	933	527	22	320	93	92	---
5	950	546	22	320	95	109	---
6*	1100	601	22	320	110	149	---
7	1122	693	22	320	112	163	76
8	1144	715	22	320	114	163	96
9	1166	737	22	320	117	163	115
10	1190	757	22	320	119	163	133
11*	1338	800	22	320	134	163	161
12	1357	889	22	320	136	163	248
13	1377	909	22	320	138	163	266
14	1397	929	22	320	140	163	284
15	1417	939	22	320	142	163	292
16*	1566	999	22	320	157	163	337
17	1582	1085	22	320	158	163	422
18	1597	1100	22	320	160	163	435
19	1617	1120	22	320	162	163	453
20	1639	1142	22	320	164	163	473
21*	1639	1072	22	320	164	163	403
22	1639	1142	22	320	164	163	473
23	1639	1142	22	320	164	163	473
24	1639	1142	22	320	164	163	473
25	1639	1142	22	320	164	163	473
Year '0' Broadcast							
Year '1' Transplant							

*Year for lime application

Source: Calculations based on listed assumptions and Table VI-24

APPENDIX E-2B

INCOME ALLOCATION TO PRODUCTION FACTORS FOR
RICE GROWING IN NONG SUA, DRY SEASON

Year	Gross Income	Net Income	Cropping Intensity %	Net Income per cul- tivated rai	Factor Allocation, Baht per rai			
					Capital	Labor	Management	Land Water
0	796	457	16	72	2	51	13	-- 7
1	1144	688	30	206	3	96	34	35 38
2	1166	710	30	213	3	96	35	35 44
3	1188	732	30	220	3	96	36	35 50
4	1210	754	30	226	3	96	36	35 56
5	1232	778	50	389	10	160	62	35 122
6	1382	903	50	451	10	160	69	35 177
7	1399	920	50	460	10	160	70	35 185
8	1417	934	50	467	10	160	71	35 191
9	1434	955	50	478	10	160	72	35 201
10	1452	965	75	724	14	240	109	35 326
11	1597	1085	75	814	14	240	120	35 405
12	1610	1098	75	824	14	240	121	35 414
13	1624	1112	75	834	14	240	122	35 423
14	1636	1125	75	843	14	240	123	35 431
15	1650	1128	75	846	14	240	124	35 433
16	1665	1155	85	982	16	272	142	35 517
17	1683	1173	85	997	16	272	143	35 531
18	1698	1188	85	1010	16	272	145	35 542
19	1716	1206	85	1025	16	272	146	35 556
20	1760	1250	85	1063	16	272	150	35 590
21	1760	1250	85	1063	16	272	150	35 590
22	1760	1250	85	1063	16	272	150	35 590
23	1760	1250	85	1063	16	272	150	35 590
24	1760	1250	85	1063	16	272	150	35 590
25	1760	1250	85	1063	16	272	150	35 590

Year '0' Transplant - from main irrigation system. Year '1' Transplant - from on-farm system.

APPENDIX E-2C
INCOME ALLOCATION TO PRODUCTION FACTORS FOR
RICE GROWING IN WET & DRY SEASON

Year	Gross Income	Net Income	Cropping Intensity %	Net Income per cul- tivated rai	Factor Allocation, Baht per rai				Charge- able Amount
					Capital	Labor	Management	Land	Water
0	1269	771	116	392	15	183	60	128	7
1	2024	1092	130	610	25	416	122	35	31
2	2064	1202	130	705	25	416	125	95	37
3	2103	1241	130	729	25	416	128	100	43
4	2143	1281	130	753	25	416	129	127	49
5	2182	1324	150	935	32	480	157	144	115
6	2482	1504	150	1052	32	480	179	184	170
7	2521	1613	150	1153	32	480	182	198	254
8	2561	1649	150	1182	32	480	185	198	280
9	2590	1692	150	1215	32	480	189	198	309
10	2642	1722	175	1481	36	560	228	198	452
11	2935	1885	175	1614	36	560	254	198	559
12	2967	1987	175	1713	36	560	257	198	655
13	3001	2021	175	1743	36	560	260	198	682
14	3033	2054	175	1772	36	560	263	198	708
15	3067	2067	175	1785	36	560	266	198	718
16	3231	2154	185	1981	38	592	299	198	847
17	3265	2258	185	2082	38	592	301	198	946
18	3295	2288	185	2110	38	592	305	198	970
19	3333	2326	185	2145	38	592	308	198	1002
20	3399	2392	185	2205	38	592	314	198	1056
21	3399	2322	185	2135	38	592	314	198	986
22	3399	2392	185	2205	38	592	314	198	1056
23	3399	2392	185	2205	38	592	314	198	1056
24	3399	2392	185	2205	38	592	314	198	1056
25	3399	2392	185	2205	38	592	314	198	1056

Source: Calculations based on listed assumptions and Table VI-24.

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