

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	1
II. A THEORY AND STRATEGY FOR AGRICULTURAL AND RURAL DEVELOPMENT	4
2.1 A Simple Model of the Roles of Research and Extension in Increasing Incomes and Productivity	4
2.2 The Role of Institutional Change in Increasing Incomes and Productivity	8
2.3 The Growth of Incomes and Productivity in Northeast Thailand	8
2.4 The Potential for Rapid and Sustained Growth of Incomes and Productivity in Northeast Thailand	11
2.4.1 Paddy	11
2.4.2 Upland Crops	12
2.5 An Area Development Approach to Rural/ Agricultural Development: A Search for a Viable Strategy for Northeast Thailand	12
2.5.1 Agricultural Sector and Rural Development	13
2.5.2 Area Based Agricultural Research	16
2.5.3 On-Farm Testing and Package Development	16
2.5.4 A Strategy for Rainfed Farmers	17
III. PROJECT ELEMENTS	18
3.1 Cropping Systems	18
3.1.1 Upland Crops	19
3.1.2 Paddy	25

3.2	Management of Water Resources for Increased Production	26
3.2.1	Supply Considerations	27
3.2.2	Water Use Considerations	28
3.2.3	Better Utilization of Rainfall	29
3.2.4	Steps in Planning and Implementation of Supplemental Water Projects	31
3.3	Livestock	32
3.4	Fisheries	33
3.5	Farming Systems	34
3.6	Land Tenure	34
3.7	Marketing and Processing	40
3.7.1	Rice Marketing	41
3.7.2	Cassava	41
3.7.3	Kenaf	41
3.7.4	Livestock	42
3.7.5	Groundnut	42
3.8	Project Approach, Extension, and Site Selection	42
3.8.1	Project Approach	42
3.8.2	Extension	43
3.8.3	Site Selection	44
3.9	Problems for Immediate Attention	47
3.9.1	Site Selection	47
3.9.2	Additional Research and Field Testing	47
1.	INSTITUTIONAL, ORGANIZATIONAL, AND ADMINISTRATIVE ASPECTS	50

4.1	Agriculture, and Area Development: Institutional Linkages	50
4.2	Opportunities for Project Management	51
V.	SUMMARY AND RECOMMENDATIONS	56
	ANNEXES	59
I.	Meetings with RTG Officials and Others	60
II.	Sites of Visits	61
III.	Level and Average Annual Rate of Growth of Gross Regional Product Per Capita, by Province	62
IV.	Availability of Rice Per Head of Rural Population, Paddy Yield and Standard Deviation of Yields, 1963-77, by Province	63
V.	Rates of Growth of Area Planted to Paddy, Northeastern Thailand, by Province	64
VI.	Note on the Use of Azolla in Rice Cropping	65
VII.	Table 1: Percentage Distribution by Province of Area Planted to Maize in Northeast Thailand, 1973-78	68
	Table 2: Percentage Distribution by Province of Area Planted to Peanut in Northeast Thailand, 1973-78	69
	Table 3: Percentage Distribution by Province of Area Planted to Kenaf in Northeast Thailand, 1973-78	70
	Table 4: Percentage Distribution by Province of Area Planted to Cassava in Northeast Thailand, 1973-78	71
VIII.	Time Trends in Area and Yield of Paddy, Northeast Thailand, 1959-1978	72
IX.	Paddy Yield Trends, by Province	74
X.	Considerations on the Potential of Direct Seeding of Photo-insensitive Paddy Varieties Under Rainfed Conditions in Northeast Thailand	75

XI.	A Brief Description of the Soils of Northeast Thailand	77
XII.	Note on Cassava Fertilization Research and Economics	78
XIII.	Estimated Crop Water Needs for Four Crops Grown During Different Seasons Under Various Irrigation and Storage Water Efficiency Conditions	81
XIV.	Water Resource Management	82
XV.	A Brief List of Key Irrigation/ Water Management Professionals and Institutions in Thailand	84
XVI.	Selected Northeast Thailand Research Institutions and Capabilities for Rainfed Crops	86
XVII.	Cropping Time Chart for Major Crops Grown in Northeast Thailand	87
XVIII.	Northeast Rainfed Agricultural Development Project Organization Chart	88
IXX.	Research Studies in Water Management Which Would Support the Northeast Rainfed Project	89
XX.	Criteria/Guidelines for District Selection	91