TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	i
ABSTRACT	HERE SIE
THAI ABSTRACT	vi
TABLE OF CONTENTS	ix
LIST OF TABLES	xiii
LIST OF FIGURES	xv
CHAPTER 1. INTRODUCTION	
1.1 Rationale	2
Productio	
1.1.2 Obstacles Crop Prod	of Further Boost of duction 3
1.2 Objectives	6
1.3 Review of Litera	
Production	n Causes of Agricultural on Growth 6 on Methods For Measuring
The Effe	cts of Technological Change tutional Factors
CHAPTER 2. METHODOLOGY	Chiang Mai Universit
	nework 13 Change in Institutions 13 ogical Change 14
2.2 Scope and Limit	tation 15

			Page
	2.3	Data Collection	16
	2.4	Data Gathered	18
	2.5	Analytical Framework	19
	2.6	Model Specification 2.6.1 Technical Efficiency Estimation 2.6.2 Selection of The Functional Forms	21 21 23
CHAPTER 3.	INS	ROSOCIO-ECONOMIC BACKGROUND,	01
	ADV	ANCEMENT OF TECHNOLOGY	27
	3.1	A General Introduction to Guizhou Province 3.1.1 Demographic and Climatic Profile of	27
		Guizhou Province	27
		3.1.2 Land Resources Endowments	28
		3.1.3 Changes in Structure of Agricultural Production of Guizhou Province	29
	3.2	Institutional Reform and Crop Production Grow	th 30
		3.2.1 The First Economic Reform (1949 - 195	59) 30
		3.2.2 Decreasing Development Period (1959 - 3.2.3 The Second Land Reform and Economic Professor (1978, 1999)	(1978) 31 c 32
		Reform (1978-1990)	32
	3.3	Advancement of Technology	37
	3.4	Crop Production	39
		3.4.1 Crops Planted	39
		3.4.2 Cropping Patterns	40
CHAPTER 4	AD	EVAILING INSTITUTIONS AND TECHNOL OPTION IN THE PRESENT CROP PRODUC STEM OF GUIZHOU PROVINCE	
	rig	nt by Chiang Mai	
	4.1	General Information About the Surveyed Villages	e r v 41e
	4.2	Family and Farm Operation Size	42
	4.3	Land Resources and Distribution	43

	1		Page
	4.4	Farmer's Investment on Land	. 46
,	4.5	Institutions of Irrigation Facility Maintenance	49
	4.6	Inputs Used	51
	4.7	Input and Output Marketing	53
	4.8	Technology Diffusion Institutions	57
CHAPTER 5.	INS	ACTS OF TECHNOLOGICAL CHANGE, TITUTIONAL REFORM, AND INPUT ON CROP PRODUCTION	60
	5.1	Estimation of Average Production Function and Frontier Production Function	63
	5.2	Production Elasticities of Inputs	68
	5.3	Production Efficiency Estimation	70
	5.4	Accounting for Crop Production Change in Different Periods	72
CHAPTER 6.	POI	LICY ANALYSIS AND IMPLICATION	79
	6.1	Increasing Chemical Fertilizer Use Is The Strategy to Increase Crop production	79
	6.2	Technology Development Is a Solution to Solv The Increasing Demand For Agricultural Produces in The Long Run	ve 87
	6.3	For a Sustained Crop Production Growth	Unive ₈₈ ity
			erved

	· · · · · ·	Page
CHAPTER 7.	SUMMARY, CONCLUSION AND RECOMMENDATION	91
*** *	7.1 Summary	91
	7.2 Conclusions and Recommendations	95
	7.3 Further Areas For Research	99
BIBLIOGRAP	HY	100
APPENDIX		103
I.	Methods to Measure Average Productivity and Marginal Value Product of Inputs A. Average Productivity of Inputs B. Marginal Value Product (MVP) of Inputs Descriptive Statistics of Relevant Variables	103 103 103
	Used in This Study	104
CURRICULU	M VITAE 41 UNIVERSIT	105

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่ Copyright[©] by Chiang Mai University All rights reserved

LIST OF TABLES

		Page
Table 1.	Spread of farmland classified by the number of locations	45
Table 2.	Distribution of man-land ratio (MLR in mu/person) in the three surveyed villages in 1992	46
Table 3.	Investment by farmers on their contracted land	47
Table 4.	Opinions towards existing land allocation	48
Table 5.	Water use conflicts and its causes	. 50
Table 6.	Level of input use in the three investigated villages in 1992	52
Table 7.	Machinery use in agricultural production processes in three surveyed villages in 1992	53
Table 8.	Urea prices at different markets in 1992	55
Table 9.	Output markets and prices in 1992	57
Table 10.	Ways to learn new production techniques for the three surveyed villages	58
Table 11.	Extension service by times visited by the extension worker in a year	58
Table 12.	Technique sources being trusted by farmers	59
Table 13.	The estimates of production functions	65
Table 14.	Production elasticities of inputs, 1952-1990	nive 69
Table 15.	Production (Technical) efficiency of crop production in Guizhou province in selected years	r V 70
Table 16.	Production efficiency of crop production	71

**		Page
Table 17.	Accounting for growth of crop production in terms of annual growth rate (%) in different time periods	. 74
Table 18.	Average productivity of inputs in 1952-1990	80
Table 19.	Marginal value product of inputs in selected years	81
Table 20.	Marginal value product (Yuan/man.day) of labor	81
Table 21.	Expected growth rate of inputs use to meet the population-induced demand for crop production, 1991-2000	85

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่ Copyright[©] by Chiang Mai University All rights reserved

LIST OF FIGURES

		Page
Figure 1.	Location map of social survey	17
Figure 2.	Effects on production growth of input increase, technological change, and efficiency improvement	20
Figure 3.	Share of each sector in total agricultural production	29
Figure 4.	Population growth vs. output growth in 1949-1990	31
Figure 5.	Increase in agricultural production in 1949-1990	33
Figure 6.	Increase in agricultural production in 1949-1990	34
Figure 7.	Frequencies of farm size at three villages in 1992	43
Figure 8.	Farmers' evaluation on irrigation facility maintenance	49
Figure 9.	Shortage of material input supply in surveyed villages	56

ลิขสิทธิมหาวิทยาลัยเชียงใหม Copyright[©] by Chiang Mai University All rights reserved