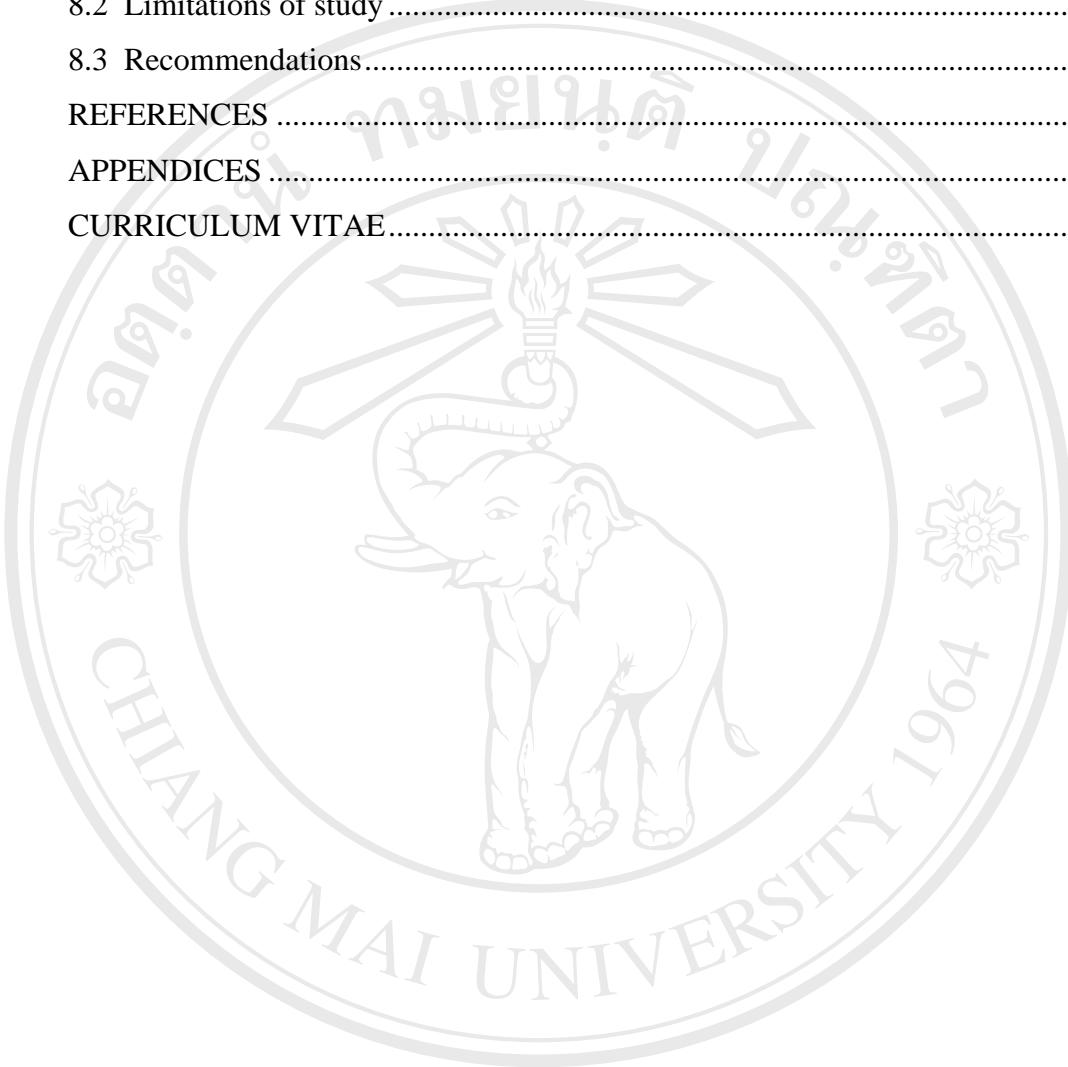


TABLE OF CONTENTS

	Page
Acknowledgements.....	iii
Abstract (Thai).....	iv
Abstract (English).....	viii
List of Tables.....	xv
List of Figures.....	xvii
Abbreviations.....	xviii
CHAPTER 1 INTRODUCTION	1
1.1 Background.....	1
1.2 Rationale of study	3
1.3 Objectives	4
CHAPTER 2 LITERATURE REVIEW	5
2.1 Concept of sustainable agriculture.....	5
2.2 Indicators of sustainable agriculture	7
2.3 Assessing sustainability	8
2.3.1 Analytic hierarchy process (AHP)	11
2.3.2 Sustainability indicator analysis (SIA)	13
2.3.3 The AMOEBA multi-dimensional reading.....	14
CHAPTER 3 CONTEXT OF NAM DONG DISTRICT	15
3.1 Geographical and topographical conditions.....	15
3.2 Soil characteristics	16
3.3 Climate characteristics	17
3.4 Hydrographic conditions.....	19
3.5 Social conditions	20
3.5.1 Communes and infrastructure	20
3.5.2 Demographic and labor	20
3.6 Economic conditions	21

3.7 Land use surfaces	24
3.8 Crop production systems	26
3.8.1 The change of cultivation pattern during the period of 1975-present.....	26
3.8.2 Cropping systems.....	26
3.8.3 Characterization of crop production	30
CHAPTER 4 RESEARCH METHODS	30
4.1 Conceptual framework.....	34
4.2 Identification of study areas and sampling methods.....	35
4.2.1 Criteria for classification of micro- zone in the district	35
4.2.2 Commune sampling	35
4.2.3 Household sampling.....	36
4.3 Methods and tools for data collection	36
4.3.1 Methods and tools for commune level	36
4.3.2 Methods and tools for household level	37
4.4 Framework for measuring sustainability indicators.....	38
4.4.1 Definition of measurable indicators.....	38
4.4.2 Measurement of indicators.....	38
4.4.2.1 Ecological sustainability	38
4.4.2.2 Economic sustainability	40
4.4.2.3 Social sustainability	41
4.5 Method of data analysis	41
4.5.1 Descriptive statistical analysis	42
4.5.2 AMOEBA approach.....	42
4.5.3 Assessing sustainability	43
4.5.3.1 Assumed indicators are equal importance	43
4.5.3.2 Assumed indicators are unequal importance	45
CHAPTER 5 CHARACTERIZATION OF STUDY SITE	48
5.1 Biophysical and socio-economic characterization.....	48
5.1.1 Land characteristics	48
5.1.2 Socio-economic characteristics.....	52
5.1.2.1 Social conditions.....	52
5.1.2.2 Economic orientation	54

CHAPTER 8 CONCLUSIONS AND RECOMMENDATIONS	113
8.1 Conclusions.....	113
8.2 Limitations of study	116
8.3 Recommendations	116
REFERENCES	119
APPENDICES	124
CURRICULUM VITAE.....	131



ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright © by Chiang Mai University
All rights reserved

LIST OF TABLES

Table	Page
3.1 Statistics on land types in the Nam Dong district	16
3.2 Population and density distribution by commune.....	20
3.3 Growth of total product value by economic domain	22
3.4 Total product value distributed by economic domain.....	23
3.5 Area of agricultural, forest, and fallow land in Nam Dong district	24
3.6 The cultivation area of each crop type in Nam Dong district in 2003	27
3.7 The past and current situation of crop area in Nam Dong district	29
4.1 Indicators used to assess sustainability of crop production systems.....	38
4.2 The AHP scales for paired comparisons.....	46
5.1 The topographical characteristics of Nam Dong district	49
5.2 Distribution of population by commune in Nam Dong district	52
5.3 Villages, population and households of study communes in 2003	54
5.4 Land surface and land use of three study communes in 2003	57
5.5 Agricultural land use in three study communes in 2003.....	57
5.6 The area of some crop types in three study communes (2000-2003)	58
5.7 Ecological potential of soil in Nam Dong district	62
6.1 Area of each agricultural land use type at households of three communes	69
6.2 Major crop production systems of three study communes	70
6.3 Land use and cropping systems of three study commune.....	73
6.4 Soil fertility management of households in the three communes	77
6.5 Pest-disease management of households in the three communes	79
6.6 Profitability of CPSs in the three communes	82
6.7 Input self-sufficiency of CPSs in the three communes	84
6.8 Yield stability of CPSs in the three communes	85
6.9 Family size and labor use correspond with each CPS in three communes	87
6.10 Food security of households in three communes.....	89

6.11 Structure of household's income in three communes	89
7.1 Indicators used in the AMOEBA diagram for three CPSs in Huong Loc	94
7.2 Indicators used in the AMOEBA diagram for three CPSs in Huong Phu	95
7.3 Indicators used in the AMOEBA diagram for three CPSs in Thuong Quang	97
7.4 Final ranking of crop production systems in Huong Loc (household level).....	100
7.5 Final ranking of crop production systems in Huong Phu (household level).....	101
7.6 Final ranking of crop production systems in Thuong Quang (household level)	102
7.7 Final ranking of crop production systems at household level (AHP method)....	103
7.8 Performance percentages of crop production systems at household level.....	106
7.9 Final ranking of crop production systems in Huong Loc (commune level)	108
7.10 Final ranking of crop production systems in Huong Phu (commune level)	108
7.11 Final ranking of crop production systems in Thuong Quang (commune level)109	
7.12 Final ranking of crop production systems at commune level (AHP method)...109	
7.13 Sustainability of crop production systems in Huong Loc (SIA method).....110	
7.14 Sustainability of crop production systems in Huong Phu (SIA method).....111	
7.15 Sustainability of crop production systems in Thuong Quang (SIA method)....112	

â€¢
Copyright © by Chiang Mai University
All rights reserved

LIST OF FIGURES

Figure	Page
3.1 The map of Thua Thien Hue province and Nam Dong district	15
3.2 The monthly average temperature in Nam Dong district.....	18
3.3 The monthly total rainfall in Nam Dong district	18
3.4 Percentage of contribution of economic domains in 2003.....	23
3.5 Agricultural land area distributed for each commune.....	25
3.6 The trend crop types from 1999 to 2003 in Nam Dong district.....	28
4.1 Conceptual framework of the study	34
4.2 AMOEBA diagram reveals integration of different indicators.....	43
4.3 Hierarchy for the determination of sustainability of CPS.....	45
5.1 Map of Nam Dong district and the position of the study communes	51
6.1 Crop proportion in Huong Loc commune.....	74
6.2 Crop proportion in Thuong Quang commune.....	74
6.3 Crop proportion in Huong Phu commune.....	75
7.1 Integration of sustainable indicators for three CPSs in Huong Loc.....	94
7.2 Integration of sustainable indicators for three CPSs in Huong Phu.....	96
7.3 Integration of sustainable indicators for three CPSs in Thuong Quang.....	97
7.4 Weight of seven indicators of farmers in three communes.....	99
7.5 Sustainability of crop production systems in Huong Loc (SIA method).....	104
7.6 Sustainability of crop production systems in Huong Phu (SIA method).....	105
7.7 Sustainability of crop production systems in Thuong Quang (SIA method).....	105
7.8 Weight of five indicators following authorities of three communes	107

ABBREVIATIONS

0 ‘ “	Degree-minute-second
°C	Degree of Celsius
%	percent
a.m.s.l	above mean sea level
km	kilometer
m	meter
cm	centimeter
mm	millimeter
m ²	square meter
ha	hectare
mil.	million
kg	kilogram
quil.	quintal
CPS	Crop Production System
CPSs	Crop Production Systems
HHS	Households
AHP	Analytical Hierarchical Process
SIA	Sustainability Indicator Analysis
SWOT	Strengths, Weaknesses, Opportunities, and Threats
PRA	Participatory Rural Appraisal
RRA	Rapid Rural Appraisal
VND	Vietnamese currency unit
Rice-A.Crop	Paddy rice-Annual crop
Rice-Fish-A.Crop	Paddy rice-Fish pond-Annual crop
I.A.Crop	Industrial annual crop
Fruit	Fruit trees
Fruit-I.P.Crop	Fruit trees-Industrial perennial crop
Equivalent:	1 USD = 16,000 VND (in 2004)