ผลกระทบของโครงการประมงของคณะกรรมการลุ่มน้ำโขงต่อการพัฒนาอย่างยั่งยืนใน บ้านอ่างน้ำหุมและบ้านห้วยน้ำเย็น เวียงจันทน์ สาธารณรัฐประชาธิปไตยประชาชนลาว



นางสาวบังอร สันตวสี

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต สาขาวิชาเอเชียตะวันออกเฉียงใต้ศึกษา (สหสาขาวิชา) บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย ปีการศึกษา 2548

ISBN 974-17-5754-9

ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

### IMPACTS OF MEKONG RIVER COMMISSION'S FISHERIES PROGRAMME ON SUSTAINABLE DEVELOPMENT IN ANGNAMHOUM AND HOINAMYEN VILLAGES, VIENTIANE, LAO PDR



Miss Bangone Santavasy

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Arts Program in Southeast Asian Studies (Inter-Department)
Graduate School
Chulalongkorn University
Academic Year 2005
ISBN 974-17-5754-9

Copyright of Chulalongkorn University

Thesis Title	IMPACTS OF MEKONG RIVER COMMISSION'S		
	FISHERIES PROGRAMME ON SUSTAINABLE		
	DEVELOPMENT IN ANGNAMHOUM AND		
	HOINAMYEN VILLAGES, VIENTIANE, LAO PDR		
Ву	Miss Bangone Santavasy		
Field of Study	Southeast Asian Studies		
Thesis Advisor	Mrs. Saikaew Thipakorn		
Thesis Co-advisor	Mya Than, Ph.D.		
Accepted by the Graduate School, Chulalongkorn University in Partial Fulfillment of the Requirements for the Master's Degree			
<i>/</i>	Dean of the Graduate School		
(Assistant Pro	ofessor M.R. Kalaya Tingsabadh, Ph.D.)		
THESIS COMMITTEE			
(D), (A)	sa Solthange Chairman		
	rofessor Withaya Sucharithanarugse, Ph.D.)		
Thesis Advisor			
(Mrs. Saikaew Thipakorn)			
	Thesis Co-advisor		
(Mya Than, I	(Mya Than, Ph.D.)		
ACULTE Member			
(Sunait Chutintaranond, Ph.D.)			

บังอร สันตวสี: ผลกระทบของโครงการประมงของคณะกรรมการลุ่มน้ำโขงต่อการพัฒนาอย่าง ยั่งยืนในบ้านอ่างน้ำหุมและบ้านห้วยน้ำเย็นเวียงจันทน์ สาธารณรัฐประชาธิปไตยประชาชนลาว (IMPACTS OF MEKONG RIVER COMMISSION'S FISHERIES PROGRAMME ON SUSTAINABLE DEVELOPMENT IN ANGNAMHOUM AND HOINAMYEN VILLAGES, VIENTIANE, LAO PDR) อ.ที่ปรึกษา: นางทรายแก้ว ทิพากร, อ.ที่ปรึกษาร่วม: ดร.มยา ทัน, 160 หน้า ISBN 974-17-5754-9.

ตลอด 2 ทศวรรษที่ผ่านมา ประเทศในภูมิภาคลุ่มแม่น้ำโขงโดยเฉพาะสมาชิกใหม่ของอาเซียน ได้จัดโครงการพัฒนาทั้งเศรษฐกิจและสังคมเพื่อขจัดความยากจน ประเด็นที่สำคัญประการหนึ่งในการ จัดการกับความยากจนที่เกิดควบคู่กับการเพิ่มขึ้นของประชากรคือความมั่นคงทางอาหาร ในการนี้ คณะกรรมการลุ่มแม่น้ำโขงหรือ Mekong River Commission – MRC ได้จัดทำโครงการประมงที่ใช้ แนวทางของการพัฒนาอย่างยั่งยืนและการมีส่วนร่วมของประชาชนในการพัฒนา บริหารจัดการ และ อนุรักษ์สัตว์น้ำในลุ่มแม่น้ำโขง

วิทยานิพนธ์นี้ได้เลือกหมู่บ้านอ่างน้ำหุมและห้วยน้ำเย็น กรุงเวียงจันทร์ ประเทศลาว เป็น กรณีศึกษาเพื่อประเมินผลของการดำเนินโครงการของ MRC

ผลการวิจัยพบว่า โครงการประมงที่เรียกว่า MRRF II 2000-2005 ได้ส่งผลกระทบในทางบวก ต่อการพัฒนาชีวิตความเป็นอยู่อย่างยั่งยืนในสองหมู่บ้านที่ทำการศึกษาทั้งในด้านทรัพยากรธรรมชาติ กายภาพ ทรัพยากรมนุษย์ การเงิน และสังคม ชาวบ้านมีความพึงพอใจในความอุดมสมบูรณ์ของ ทรัพยากร มีปริมาณปลาที่จับได้มากขึ้น การประมงทำให้ชาวบ้านถึง 1 ใน 3 ของประชากรมีรายได้และมี งานทำมากขึ้น รายได้ของชาวประมงสูงถึง 1,000 ดอลลาร์ต่อปี นอกจากนี้โครงการประมงยังส่งเสริมให้ ชาวบ้านเข้ามามีกิจกรรมร่วมกันมากขึ้น มีเครือข่ายมากขึ้น และมีความผูกพันกันทางสังคมมากขึ้น ซึ่งจะ นำไปสู่การพัฒนาที่ยั่งยืนต่อไป

อย่างไรก็ตาม โครงการ MRRF II ก็มีข้อด้อยที่สมควรได้รับการปรับปรุง กล่าวคือ 1) การส่งเสริม อาชีพประมงอาจทำให้เกิดการจับปลาได้มากเกินกว่าปริมาณการเพิ่มของปลาในอ่างน้ำ 2) การลงทุน เพื่อซื้ออุปกรณ์จับปลาจากต่างประเทศอาจเป็นการลงทุนที่ไม่คุ้มค่า และ 3)ชาวประมงที่จับปลาในเวลา กลางคืนเป็นการเสี่ยงต่อการติดเชื้อมาเลเรีย ประเด็นเหล่านี้สมควรได้รับความสนใจ นำมาพิจารณา ประกอบเพื่อหาทางป้องกันปัญหาในอนาคต

สาขาวิชา เอเชียตะวันออกเฉียงใต้ศึกษา (สหสาขาวิชา)

ปีการศึกษา 2548

## 4689549720: MAJOR SOUTHEAST ASIAN STUDIES

KEY WORDS: MEKONG RIVER COMMISSION / SUSTAINABLE FISHERIES PROGRAMME DEVELOPMENT

BANGONE SANTAVASY: IMPACTS OF MEKONG RIVER COMMISSION'S FISHERIES PROGRAMME ON SUSTAINABLE DEVELOPMENT IN ANGNAMHOUM AND HOINAMYEN VILLAGES, VIENTIANE, LAO PDR. THESIS ADVISOR: MRS. SAIKAEW THIPAKORN, THESIS CO-ADVISOR: MYA THAN, Ph.D., 160 pp. ISBN: 974-17-5754-9.

Over the last two decades, countries in the Mekong sub-region especially the new members of ASEAN (Cambodia, Lao PDR, Myanmar and Vietnam) have undergone on number of socio-economic development, one of the most constraints is to combat poverty. The increase of population had led to the increase of demand on resources and food. It is expected that food security need to be double through scare resources. The Fisheries Programme's objectives of Mekong River Commission (MRC) was to coordinate and sustainable development, utilization, management and conservation of the fisheries of the Mekong Basin, by focusing on rural livelihood and promoting local participation for self-sufficient.

The impacts of MRC's Fisheries Programme on Sustainable Development in Angnamhoum and Hoinamyen Villages, Vientiane, Lao PDR was chosen as a case study for thesis research. This study attempted to assess the extent to which this MRC's sustainable development had implication for improving the livelihood development of the people in the Mekong sub-region, particularly the two fishing villages in Lao PDR.

The research findings suggested that the fisheries programme or MRRF II 2000-2005 of MRC contributed considerably positive impacts on the sustainable livelihood development of the people in Angnamhoum and Hoinamyen Villages in terms of natural, physical, human, financial and social aspects. For example, the community took pleasure on the prosperity of its natural resource: fish catch increased, though fluctuated. Fisheries also generated employment and income to more than one hundred people in both villages; a fisher earning exceeded US\$ 1,000 per year. Fisheries programme led to people's participation and strengthened social tie, and community network, which are the key components of sustainable community development.

However, it should be noted that, this particular MRRF II project had its disadvantages. In order to prevent such negative effects to occur in future similar fishing projects attempted, following factors should be taken to consideration as precaution measure. The promotion of fisheries may cause over-fishing conflicts over natural capital and human activities, and conflicts over investment on fishing gears and increased catch. Fisheries also affects people's health; Fishermen may hit malaria while fishing at night. It is crucial to balance and ponder on these issues. Hence it is essential to maximize local resources and enable personnel skills and knowledge to achieve sustainable livelihood development for fisheries programme and other aspects of village life.

Field of Studies Southeast Asian Studies

(Inter-Department)

Academic Year 2005

Student's signature ...

Advisor's signature

Co-advisor's signature...

#### **ACKNOWLEDGEMENTS**

This book reflects the continuous effort over the last two years or so, and I owe a debt to all those who have played a part in that process. In particular I have profited from the privilege of working with so many professors, lecturers and researchers in my role as M.A student and supervisee, though often their support, comments, questions and argument acted as stimulus to further thought and consideration. May I express my sincere thankful to my advisors: Ahjarn Saikaew Thipakorn, Researcher, Institute of Asian Studies (IAS) as Thesis Advisor and Dr. Mya Than, Visiting Fellow, Institute of Security and International Studies (ISIS) as Thesis co-advisor. Dr. Sunait Chutintaranold, Director of SEA Studies Center, Assoc Prof. Dr. Withaya Sucharithanarugse, Senior Consultant, Lecturer: ASEAN in Regional and Global Context.

I have also been fortunate to work on preliminary data collection at regional organization with the Mekong River Commission (MRC), especially Mr. Khamthanh Vathanatham, Fisheries Programme Officer, Ms. Peroong Bamrungrach, Technical Support Division, Mr. Wolf D. Hartmann, Programme Coordinator, Management of River and Reservoir Fisheries in the Mekong Basin, and Ms. Keysone Sayasen, Gender Specialist, Fisheries Programme. I am grateful to their technical support.

This research would not have been accomplished without the great contribution from the Living Aquatic Research Resource Centre(LARReC), Vientiane Lao PDR, especially, Mr. Lieng Khamsivixay, Director of LARReC, Mr. Sommano Phounsavath, Head of Capture Fisheries Unit and Mr. Khamla Vongphachanh, Technical Staff and two research volunteers: Ms. Phonesavanh Philavanh and Ms. Ekaphap Latsamy. I have also benefited from the interest of, conversations with, and interviews from District Agriculture and Forestry Office (DAFO) Mr. Konglea MRRF II Project Coordinator, Ms. Suthida Inthasom, Technical Staff, Reservoir Fisheries Management Committee (RFMC) members, Fisher group, Fish Traders and the community in Angnamhoum and Hoinamyen Villages. I am thankful to their valuable time, kind support and cooperation.

I wish to express my deep gratitude to my family and friends who have shown patience beyond the call of duty. I would like to extend my thanks to all staff at SEA Studies Center, Faculty of Arts, Chulalongkorn University for their kind assistance and the Rockefeller Foundation for grant and support. Finally, would also like to thank all people who provided the necessary information and assistance to make this research possible.

# TABLE OF CONTENTS

		Page
Abstract (Thai)	)	iv
	ish)	
	nents	
Table of Conte	nts	vii
List of Tables		xi
List of Illustrat	ions	xii
List of Maps		xiii
List of Boxes		xiv
Acronyms		XV
Glossary		xvii
Measurement		xviii
Chapter I	Introduction	1
1.1 Meko	ng Sub-Region Historical Background	1
1.1.1	A Brief History of the Mekong River and Civilization	1
1.1.2	Fish, Fishing, Fisheries and their Transformation	4
1.1.3	The Emergence of Mekong River Commission	5
1.1.4	Lao PDR and Development Perspective	11
1.2 Purpo	se of the Study	17
1.2.1	State of the Problem	17
1.2.2	Objectives of the Study	19
1.2.3	Hypothesis	19
1.2.4	Scope of Study	19
1.2.5	Limitation	20
1.3 Contr	ibution of the Study	21
1.3.1	Significance of the Study	21
1.3.2	Expectation of this Study	21
1.4 Struct	ure of the Thesis	22

		Page
Chapter II	Literature Review	24
2.1 Theo	ory and Conceptual Framework	24
2.1.1	What is "Impacts"?	24
2.1.2	2 Development Discourse	25
2.1.3	The Contemporary Concept of Livelihood Development	27
2.2. Mek	cong Sub-Region Development Issues	30
2.2.1	Introduction	30
2.2.2	Legal and Administrative Studies of the Mekong	31
2.2.3	Political and Sub-Regionalism	33
2.2.4	Socio-Economic Development	35
2.3 Fishe	eries and Aquaculture Development	37
2.3.1	Fish in the Lower Mekong Basin	37
2.3.2	2 Development – Threats and Controversial Issues	38
2.3.3	National Policies on Fisheries	39
2.3.4	Existing Research Addressed to Fisheries Issues	40
Chapter III	Research Methodology	42
3.1 Key	Terminologies in Use	42
3.1.1	The Mekong River Basin	42
3.1.2	Prisheries Programme	44
3.2 Crite	ria of Selection	45
3.2.1	Sample Design	45
3.2.2	Selection of Research Sites	46
3.2.3	Seasonal Calendar	48
3.2.4	Research Team	50
3.3 Rese	arch Methods	50
3.3.1	Design for Research Methodology	50
3.3.2	Data Analysis	52
3.3.3	Research Ethics	52
Chapter IV	Research Finding	54
4.1 Histo	orical Background of Namhoum Reseservoir	54
4.1.1	Fish Conservation Zones	55
4.1.2	Patrolling System	56
4.1.3	Administrative Structure of Naxaythong District	57

			Page
4.2 (	Charac	cteristics of the two fishing illages	58
4	4.2.1	Baseline Data of Angnamhoum Village	59
4	4.2.2.	Baseline Data of Hoinamyen Village	62
4.3 N	Manag	gement of Reservoir Fisheries	64
2	4.3.1	Project Objectives and Mandate	64
2	4.3.2	Who Are the Stakeholder?	67
4	4.3.3	Project Structure and Coordination System	68
4	4.3.4	Project Intervention 2000-2005	69
4	4.3.5	Composition of RFMC and Leadership	71
4	4.3.6	Project Financial Aid System	73
4	4.3.7	Capacity Building	74
4	4.3.8	Fish Marketing System	74
2	4.3.9	Reservoir Development Fund	76
2	4.3.10	Fishing Enforcement	76
Chapter '	V	Analysis of Research Finding	78
5.1 1	Vatura	ıl Capital	78
:	5.1.1	Natural Capital	78
:	5.1.2	Fish Production	80
5.2 F	Physic	al Capital	83
:	5.2.1	Physical Capital	83
:	5.2.2	Fishing Gears and Accessibility	85
5.3 F	Humai	n Capital	87
:	5.3.1	Capacity Building	88
:	5.3.2	Health and Education	90
5.4 I	Financ	cial Capital	92
:	5.4.1	Financial Capital	93
:	5.4.2	What are the perceptions of fishermen on fishing?	94
:	5.4.3	Household Income	96
;	5.4.4	Fund Raising Potentials	98
5.5	Socia	l Capital	100
:	5.5.1	RFMC and Social Capital	100
:	5.5.2	Interconnection of Different Community	104
	5.5.3	Social Capital	107

		Page
Chapter VI	Conclusion	110
6.1 Cond	clusion	110
6.2 Reco	ommendation	112
6.2 Futu	re Work	113
References		114
Appendices		122
A.1 Q	uestionnaires for in-depth interview- village headman	123
A.2 Q	uestionnaires for focus group interview- villagers	127
A.3 Q	uestionnaires for implementing agencies	130
B.1 S	ummary of focus group interview – Angnamhoum village	131
B.1 S	ummary of focus group interview – Hoinamyen village	132
C.1 M	Iap of Angnamhoum village	133
C.1 M	Iap of Hoinamyen village	134
D.1 S	easonal calendar of Angnamhoum village	135
D.2 S	easonal Calendar of Hoinamyen village	136
E.1 M	IRRF II Project Intervention 2000-2005	137
E.2 F	ish species identified at Namhoum reservoir	140
Riography		142

## LIST OF TABLES

		Page
Table 1.1.4D	Land Areas of Southeast Asian Countries	14
Table 1.1.4G	National Human Development Index	16
Table 1.2.4	Scope of the Study	19
Table 2.1.3	Fisheries Programme in a Sustainable Livelihood Context	29
Table 3.1.2	MRC Management Reservoir Fisheries in Lao PDR	45
Table 3.2.1	Samples of the Research	46
Table 3.3.2	Process of Research Methodology	52
Table 4.2.1	Background of Angnamhoum Village in Brief	60
Table 4.2.2	Background of Hoinamyen Village in Brief	63
Table 4.3	Summary of MRRF II Project in Lao PDR 2000-2005, Project initiatives	
	and achievements	77
Table 5.1.1A	Natural Capital - Angnamhoum Village	78
Table 5.1.2B	Natural Capital - Hoinamyen Village	79
Table 5.1.2A	Fish Stocking at Namhoum Reservoir (2000-2004)	81
Table 5.1.2B	Statistics of Catchments in MRRF II from (2000-2004) Fish Production	
	by Year (unit: kg)	82
Table 5.2.1 A	Physical Capital - Angnamhoum Village	84
Table 5.2.1B	Physical Capital - Hoinamyen Village	84
Table 5.2.2	Fishing Gears Used at Namhoum Reservoir	86
Table 5.3.2A	Health and Education - Angnamhoum Village	91
Table 5.3.2B	Health and Education - Hoinamyen Village	91
Table 5.4.1 A	Financial Capital - Angnamhoum Village	93
Table 5.4.1B	Financial Capital - Hoinamyen Villages	94
Table 5.4.2	Fishermen at Two Villages	95
Table 5.4.3A	Household Income-Angnamhoum Village	97
Table 5.4.3B	Household Income-Hoinamyen Village	98
Table 5.5.2	Project Network and Coordinating System	106
Table 5.5.3A	Social Capital – Angnamhoum Village	107
Table 5.5.3B	Social Capital – Hoinamyen Village	108
Table 5.5.3A2	Project Intervention – Angnamhoum Village	108
Table 5.5.3B2	Project Intervention – Hoinamyen Village	109

# LIST OF ILLUSTRATIONS

		Pag€
Figure 1.1.3B	Interim Mekong Committee Organization Chart	8
Figure 1.1.3C	Organigram of the Mekong River Commission	10
Figure 1.4	Structure of the Thesis	22
Figure 2.1.3	Conceptual Framwork	28
Figure 3.2.3	Seasonal Calendar for Field Research	49
Figure 4.1.3	Administrative Structure of Naxaythong District	58
Figure 4.2.1	Administrative Structure of Angnamhoum Village	61
Figure 4.3.1	Programme Structure of Mekong River Commission	65
Figure 4.3.3	Organization Set Up	68
Figure 4.3.4	MRRF II Project Cycle	69
Figure 4.3.5	The Composition of RFMC	72
Figure 4.3.6	Procedure of Cash Flows	73
Figure 4.3.8	Fish Marketing System	75
Figure 5.1.1A	Geography of Angnamhoum Village	79
Figure 5.1.1B	Geography of Hoinamyen Village	80
Figure 5.4.2	Fish Catch at Namhoum Reservoir MRRF II (2000-2004) Fish Productio	n
	by Year (unit: kg)	96
Figure 5.4.3A	Composition of Household Income – Angnamhoum Village	97
Figure 5.4.3B	Composition of Household Income – Hoinamyen Village	98

## LIST OF MAPS

		Page
Map 1.1.4A	Southeast Asian Map	11
Map 1.1.4D	Map of Lao PDR	14
Map 2.3.2	Existing Hydropower Project in the Mekong River Basin	38
Map 3.1.1A	Mekong River Profile from Headwater to Mouth	42
Map 3.1.1B	Lower Mekong Basin Flow Contribution	43
Map 3.2.2A	Map of MRRF II Project Sites	47
Map 3.3.2B	Map of Research Sites	48
Map 4.1	Map of Namhoum Reservoir	54
Map 4.1.1	Fish Conservation Zone, Namhoum Reservoir	55
Map 4.1.2	Management of Namhoum Reservoir	55

### LIST OF BOXES

		Page
Box 5.1	Natural Asset	78
Box 5.2	Physical Asset	83
Box 5.3	Human Asset	87
Box 5.4	Financial Asset	92
Box 5.5	Social Asset	100
Box 5.5.1	Measurement of Social Capital	101

#### **ACRONYMS**

ADB: Asian Development Bank

AFTA: ASEAN Free Trade Areas

AMBDC: ASEAN Mekong Basin Development Cooperation

ARI: Asian Research Institute

ASEAN: Association of Southeast Asian Nations

CBFM: Community-Based Fisheries Management

CCA: Common Country Assessment

CEO: Chief Executive Officer

CEPT: Common Effective Preferential Tariff for AFTA

CERP: Center for Research on Plurality in the Mekong Region

CNMC: Cambodian National Mekong Committee

CU: Chulalongkorn University

DAFO: District Agricultural and Forestry Office

DFID: Department for International Development (U.K)

DFMC: District Forestry Management Committee

ESCAFE: United Nations' Economic Commission for Asia and the Far East

ESCAP: United Nations Economic and Social Commission for Asia and the

Pacific

EIA: Environment Impacts Assessment

FAO: Food and Agriculture Organization

FCZ: Fish Conservation Zone

GDP: Gross Development Product

GMS: Greater Mekong Sub-region

HDI: Human Development Index

JC: Joint Committee

JUGO: Joint Users and Government Staff in Reservoir Co-management and User

Community Organization.

Lao PDR: Lao People's Democratic Republic

LARReC: Living Aquatic Resource Research Center, Lao PDR

LMB: Lower Mekong Basin

LNMC: Lao National Mekong Committee

LPRP: Lao People Revolutionary Party

MDG: Millennium Development Goals

MDRN: The Mekong Development Research Network

MoAF: Ministry of Agriculture and Forestry, Lao PDR

MRB: Mekong River Basin

MRC: Mekong River Commission

MRCS: Mekong River Commission Secretariat

MRF: Management of Reservoir Fisheries

MRRF: Management of River and Reservoir Fisheries

NAFTA: North Africa Free Trade Area

NEM: New Economic Mechanism

NPEP: National Poverty Eradication Plan

NSC: National Statistical Centre, Lao PDR

PME: Planning, Monitoring and Evaluation

PRA: Participatory Rural Appraisal

RDF: Reservoir Development Fund

RFMC: Reservoir Fisheries Management Committee

RTC: Regional Training Course

SEAFDEC: Southeast Asian Fisheries Development Center, Singapore

SL: Sustainable Livelihoods

SLORC: The State Law and Order Restoration Council, Myanmar

SPSS: Statistics Package for Social Science

TBA: Traditional Birth Attendant

TNMC: Thai National Mekong Committee

UNDAF: United Nations Development Framework

UNDP: United Nations Development Programme

UNEP: United Nations for Environment Programme

UNICEF: United Nations Children's Fund

UNTAC: United Nations Transitional Authority in Cambodia

VNMC: Vietnamese National Mekong Committee

WB: World Bank

WDR: World Development Report

WTO: World Trade Organization

#### **GLOSSARY**

Ang: Reservoir
Ban: Village

Fa: His/Her Majesty

Hoi: Spring water

Lao Loum: Lowland Lao, who occupy the low land plains and the Mekong River

valley, and constitute two third of the total population

Lao Soung: Highland Lao, it is well known as "Hmong" are those inhabit on the

high mountain top over 1,000 m, constituting 10 per cent of the total

population.

Lao Theung: Midland Lao, who reside on the mountain slope comprising

approximately 22 per cent of the population, the Lao Theung or another

common name is known as "Kah", who are thought

to have been the first in habitants of Laos in the pre-historic era.

Lane Xang: Million of Elephants

Muang: District

Naga: Giant serpent

Nam/Menam: River

Neohom: Elders, Lao Front for Nationa! Construction

Pa: Fish

Phi: A belief in spirit

Wat: Monastery, a place of worship

### **MEASUREMENT**

A.D: Anno Domini

B.E: Buddhist Era

f: Frequency (SPSS), it is simply the number of occurrence of it in the

selected variable

Ha: Hectare

HP: Horse Power

Kip: Unit of Lao Currency, i.e:

1 USD is equivalent to 10,000 Kip; and

1 Thai Bath is equivalent to approximately 260 Kip

(Exchange rate given during the research conducted Jan-Mar 2005)

Kg: Kilogram

Km: Kilometer

Km<sup>2</sup>: Square kilometer

m: Meter

m2: Square meter

Max: Maximum
Min. Minimum

N: Total number of respondent (SPSS)

N/A: Not applicable and/or no Answer

ppp: per capita
USD: US dollar